our environment it's a living thing

Department of Environment and Climate Change NSW

Sustainable Property Guide

Colonial First State

Global Asset Management

Department of **Environment & Climate Change** NSW

www.environment.nsw.gov.au

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Contents

Sustainable Property Guide

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Department of Environment and Climate Change NSW

1

Sustainability in the Commercial Property Sector

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1.0

Section 1 overview

This section introduces the concept of sustainability and describes its application and importance within the commercial property sector.

The commercial property sector is not alone in facing the challenge to better understand and integrate sustainability into business activities and asset management. Sustainability has already prompted a change in approach to day-to-day business in some aspects of property management, and industry leaders are integrating it into their core business functions. This has created new expectations among industry stakeholders and across the broader community.

1.1 Sustainability – the business context

Explains the concept of sustainability and sustainable development in the context of the commercial property industry.

Lists common drivers for making a commitment to sustainability and developing the business case.

Discusses the impact of sustainability on building valuation.

1.2 Industry overview: sustainable development, 'green' buildings and building rating schemes

Lists characteristics of sustainable property development, and attributes of 'green' buildings.

Discusses green building benchmarks and provides an overview of green building rating schemes: NABERS and Green Star.

Worksheet 1.2A Characteristics of sustainable property development

Worksheet 1.2B Environmental benchmarks

1.3 Climate change, global warming and the built environment

Provides a very brief background on the causes and effects of global warming.

Presents a bullet-point summary of the potential impacts of global warming on the built environment.

(For information about adapting to climate change see section 2.4 of this Guide.)

Sustainability – the business context

1.1

What is 'sustainability'?

The concept of sustainability in the commercial property industry is being shaped and driven, as in most other industries, through the basic framework of sustainable development.

In essence, sustainable development refers to:

> 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs'.
>
> From *Our Common Future*, The Bruntland Commission, 1987, World Commission on Sustainable Development.

This internationally accepted definition has been in place since the early 1990s, but the term sustainability has become popular more recently – partly due to its social, environmental and economic applications. The challenge is to achieve sustainability in the context of development and not to dismiss it as a contradiction in terms – or merely use it as 'greenwash'.

Increasing awareness of sustainability

The global environmental agenda is a significant driving force in catalysing community awareness and expectations. Reducing the ecological footprint and carbon emissions of the built environment, in the context of increasing population and urbanisation, is an imperative.

- In recent years the impacts of climate change have focused attention on greenhouse gas emissions from the property sector. Most of these come from the consumption of electricity derived from burning coal as well as the use of natural gas.
- The embodied energy in the production and transportation of goods and services needs to be taken into consideration when evaluating the sustainability of the supply chain engaged in the property sector.
- Drought has also contributed to wider concern and greater efforts to make commercial buildings more water efficient.

What's in this section

Sustainability Advantage

Sustainability Advantage is a business support service from the Department of Environment and Climate Change NSW (DECC). It is designed to help businesses understand sustainability, successfully manage their operations to achieve better environmental outcomes and add business value.

If your organisation joins Sustainability Advantage, specialist consultants will be appointed to help you improve in the following areas of business sustainability:

- vision, commitment and planning
- resource efficiency
- environmental risk and responsibility
- external stakeholder and staff engagement
- supply chain management
- climate change.

Participants in Sustainability Advantage are organised into groups of like organisations or in supply chain groups, for example the Stockland cluster and Goodman cluster of businesses. Take this opportunity to network with your industry and supply chain.

For more information please contact Business Partnerships on (02) 8837 6000 or email sustainbus@environment.nsw.gov.au

- The continuing rise in costs of waste disposal to landfill are influencing both the construction and operation of commercial buildings. Responsibility must also be taken for the appropriate disposal of wastes, including those which may still be accepted in landfill but may risk leakage of pollutants into groundwater.
- There is greater recognition of the influence of indoor environment quality on workplace health and productivity, itself a major determinant in business profitability.

These are strong drivers which all contribute to the business case for action. The business case is being further stimulated by broader recognition of the need for immediate action on climate change. (See Section 2: 'Becoming a Sustainable Organisation'.)

Industry bodies are responding. The Property Council of Australia (PCA) has begun promoting 'sustainability' as an alternative to the longer standing principles of sustainable development. The PCA calls for a 'triple bottom line approach to business, balancing environmental, social and economic accountability'.[1]

Defining sustainability in the commercial property sector

There is no single, accepted definition of sustainability within the commercial property sector. However, a range of environmental tools is available to help organisations develop their own criteria and work towards greening their property portfolio, acquisition or tenancy in the context of their business goals, corporate values and organisational culture.

The scope for defining sustainability and integrating it into an organisation-wide policy or business statement is the basis of the industry overview in Section 1.2 of this Guide.

Aspects of sustainability that are becoming more common throughout the commercial property sector include:

- recognising that the environmental impacts of the sector – including impacts on climate change and potable water availability – are significant, and that mitigation of those impacts must take a beyond-compliance perspective
- accepting the link between property and social infrastructure, including the creation of a sense of place, contribution to social amenity and the inherent relationship between healthy workplaces and increased workforce productivity
- acknowledging that business value, including but not limited to economic value, can be created by a committed and comprehensive approach to:

Drivers for environmental sustainability in the commercial property sector

- Lowering operational costs (more efficient use of labour, energy and raw materials and reduced waste disposal costs)
- Preventing and reducing environmental liabilities (reducing need for clean-up, minimising potential for fines or compensation)
- Lowering employee turnover (reducing recruitment costs and increasing efficiency)
- Retaining talented staff (through improved reputation and support for community infrastructure)
- Avoiding delays to project approvals (decreasing cost of approvals and likelihood of delays to new projects)
- Meeting community expectations (avoiding or reducing costs of liaison, media coverage, technical studies, or compensation through community consultation and collaboration)
- Meeting customer expectations (avoiding or reducing exposure to highly competitive market conditions)
- Increasing perception of the alignment with Premium or Grade-A quality
- Increasing shareholder value (better managing community and customer perception, reducing potential for incidents and potential for liabilities)
- Increasing access to capital (greater attractiveness to financial lenders through reduced exposure to liabilities, and meeting the expectations of ethical funds)
- Limiting exposure to new regulation (due to reputation, community and political recognition)

(continued p 3)

1 Sustainable Development Guide: A Roadmap for the Commercial Property Industry, Property Council of Australia, 2001

- using resources (such as energy, water and materials) in an efficient manner and sustainably where possible
- anticipating and managing risks and opportunities across all levels of an organisation
- recognising that all stakeholders, internal and external, expect improvements in economic, social and environmental performance.

Sustainable organisations

To be sustainable in the longer term, organisations – particularly those driven by the value of their reputation – need to adopt sustainability and the principles of triple bottom line performance as key business performance measures.

Triple bottom line performance

Triple bottom line (TBL) performance refers to social, environmental and economic performance. Some aspects of property sustainability fall across one or more of these criteria. For example, the relationship between property and public or private transport networks involves environmental issues such as vehicle emissions, social issues in terms of health resulting from exposure to transport pollutants, and economic issues in terms of cost of transport to property occupants.

To become sustainable and continue to deliver high levels of performance, organisations must embed sustainability principles and practices into their business culture and demonstrate the benefits and achievements to their stakeholders.

In this context, sustainability is often seen as an attribute that supports differentiation of an organisation within its marketplace. For more information see Section 2: 'Becoming a Sustainable Organisation'.

Environmental rating schemes

The concept of sustainability is emerging steadily in the property sector. This is driven partly by the development of environmental rating schemes for buildings. Most recently the concept of a 'green' building has been included in the rating for 'Premium' or 'Grade-A' commercial office space by the Property Council of Australia.

The Property Council of Australia's 2006 *A Guide to Office Building Quality* includes assessment criteria using the DECC's NABERS and Green Building Council of Australia's Green Star ratings. Essentially, neither a 'Premium' nor 'Grade-A' new office building should be promoted as such unless it has achieved as a minimum a 4-star Green Star rating and 4.5-star NABERS Energy rating. For more information about the rating schemes see Section 1.2 of this Guide.

The business case for sustainability is now established and being integrated into the marketing language for commercial buildings.

Drivers (continued)

- Avoiding or reducing litigation risks and costs (improving defence against claims and reducing risk of penalties)
- Limiting exposure to increased environmental charges for carbon emissions and use of landfill for waste management
- Improving access to land, resources, people (supporting longer-term business growth through sustainability)
- Achieving longer term product and service sustainability, as a producer and consumer, by greening the supply chain, also reducing exposure to short-term market expectations.

Build it into your kit bag

'What I am seeing now is that many businesses around the world are either willing, or being forced, to build another operating principle into their kit bag – and that is: to do what they do well, but do it in a sustainable fashion.'

Ross Taylor, Global Chief Executive Retail and Communities, Lend Lease Group (*Australian Financial Review*, 11 October 2006)

Creating value

Organisations wishing to demonstrate commitment and progress in this area must focus on developing sustainable property programs that aim to create or enhance property values – to the fund, to the client and to the organisation as a whole, including its reputation – in both the short and longer terms.

Establishing the metrics

Wherever possible, the value created needs to be made tangible to property owners, investors and tenants. The challenge is to identify and standardise metrics which will enable social and environmental performance to be equated with financial metrics on the property's balance sheet. Efforts to do this are underway, but there are not yet formulas or models which have been accepted globally by the property industry.

So far, economic considerations that can be quantified – for example impacts of energy and water savings on operational budgets, or capital investment impact on property value – remain the only tangible and directly accounted financial references to sustainability.

However, it is imperative that the value of sustainability is demonstrated to building owners, investors and occupiers. Valuation models for commercial buildings recognised by owners or investors can be used to demonstrate this.

Sustainability valuation model

The valuation model below illustrates the positive impact of sustainability initiatives on a typical A-grade, Sydney CBD, single-tenanted office building.

	Before upgrade	After upgrade
Gross effective rent	$560/m^2	Unchanged at $560/m^2
Outgoings	$150/m^2	Reduced by $3.32/m^2: $146.68/m^2
Upon lease expiry	6 months letting up (50% retention)	Allow 3 months letting up (50% retention)
Capitalisation rate	6.75%	Unchanged at 6.75%
Capitalisation approach	$176.8 m	$178.0 m
Discounted Cash Flow (DCF) approach	$177.1 m	$181.0 m
Adopted value	$177 m	$180.0 m
Capital expenditure Year 1	$400,000	$720,115

To Investa, sustainability simply makes good business sense

'Investa owns and manages over $7 billion of commercial office property and is a sustainability leader in the Australian property industry.

For Investa, sustainability means adopting business strategies and practices that meet the needs of the Group and its stakeholders today while protecting the human and natural resources that will be needed into the future.

Investa's sustainability practices are targeted at:

- fostering innovation
- improving identification and management of risks
- elevating recognition of changes in the business environment
- enhancing reputation and engendering trust and confidence with those with whom we deal
- strengthening employee alignment and motivation
- reinforcing access to capital through greater disclosure.'

www.investa.com.au

Modelling for upgrades

'The Jones Lang LaSalle valuation model (table on the left) describes the capital impact of a series of good practice lighting, HVAC and commissioning upgrades on a typical A-grade Sydney CBD office building. The upgrades at an additional capital expenditure cost of $320,115, were found to create $99,700 savings in annual outgoings. The initiatives added $3 million in capital value and provided a return of almost 10 times the investment. They also raised the NABERS Energy rating by one star, which would make the building more attractive to tenants.'

Jones Lang LaSalle. For more information see *Assessing the Value of Sustainability*, Jones Lang Lasalle, February 2006, www.joneslanglasalle.com.au/NR/rdonlyres/1659B752-E030-43EC-BF63-E8E06F9A5A94/0/assessingvalue_whitepaper2006.pdf

The benefits of energy efficiency and reduced energy costs to building owners and tenants are proven. However, measurements of the value created by a more sustainable approach to managing and developing property need to broaden their scope beyond resource efficiency. For example, the industry would benefit from greater efforts to measure impacts of waste reduction and, in particular, workplace productivity.

When valuing property that does not meet the standards of sustainability the market requires, valuers will need to take care that they allow for sufficient capital expenditure to carry out the upgrading works that will be required. Conversely, the more sustainable the property the less that will have to be spent in altering it.

See also Section 3: 'Sustainability and Property Management', particularly Section 3.1: 'Incorporating sustainability into decision making', and Section 3.2: 'Sustainability and property acquisitions'.

Linking building environment to productivity

Many property organisations and tenants recognise that workplace productivity is linked – directly or indirectly – to the quality of the built environment. Building improvements, such as better lighting or access to sufficient fresh air, are likely to have a positive effect on productivity. It appears that small increases in productivity and staff retention can lead to significant monetary savings in tenants' workforce costs.

Supporting the business case

The challenge facing the industry is to develop the capability to measure and promote the value created by the more intangible aspects of sustainability, such as:

- impact on corporate reputation
- capacity to attract ethical funding
- savings associated with retention of valued staff or attraction of more progressive staff due to an organisation's proven sustainability record.

If the industry can quantify more of the drivers listed above, and therefore more effectively demonstrate the economic benefits of sustainability, this will help to build the business case for allocating resources to sustainability initiatives.

Defining sustainability at Colonial First State Global Asset Management

'As part of its Sustainability Strategy developed in 2004, Colonial First State Global Asset Management (then Colonial First State Property) realised the need to define what sustainability meant to the organisation and in the context of its vision and values. The following was adopted:

Vision

Colonial First State Global Asset Management will set the standard in property funds management and corporate real estate by implementing sustainable business practices which deliver value and demonstrate environmental stewardship while being responsive to the expectations of society.

Definition

Sustainability, through corporate governance and business practices, means Colonial First State Global Asset Management is able to deliver value to its investors, tenants and clients by investing in, developing and managing property while:

- utilising resources in an efficient manner
- anticipating and managing risks and opportunities across all levels of business,
- recognising the expectations of stakeholders with regard to economic, social and environmental performance.'

Colonial First State Global Asset Management, www.cfsgam.com.au

A risk-based approach

The concept of risk underpins many aspects of sustainability.

- What are the risks associated with steering a sustainable building through aspects of its design, construction, operation, refurbishment and disposal?
- What is the risk to an organisation's reputation if its stakeholders don't perceive its actions as supporting sustainability?
- Will climate change result in more regulation?

Sustainability programs and initiatives generally take a risk identification and mitigation approach, and this is a good way of discovering potential for improvements that can extend performance well above compliance. Organisations can benefit by integrating sustainability objectives into their standard risk assessment processes. There are many synergies between sustainability and risk management at both the higher corporate governance level and the asset management level.

Further information

- Australian Building Codes Board, www.abcb.com.au
- Australian Cooperative Research Centre for Construction Innovation, www.construction-innovation.info/
- Green Building Council of Australia Green Star rating scheme, www.gbca.org.au
- International Council for Research and Innovation for Building and Construction, www.cibworld.nl/website/
- Jones Lang Lasalle Sustainability White Papers, March 2005 and February 2006, www.joneslanglasalle.com.au
- National Australian Built Environment Rating System, NABERS, www.nabers.com.au
- Property Council of Australia, www.propertyoz.com.au
- Royal Institution of Chartered Surveyors:
  - 'Sustainable Property Investment and Management', September 2008, www.rics.org and
  - 'Financing and valuing sustainable property: we need to talk', April 2007, www.rics.org/Practiceareas/Property/Valuation/FiBRE%20of%20Sarasota%20event.html
- Colonial First State Global Asset Management, www.cfsgam.com.au
- Investa Property Group, www.investa.com.au

Industry overview

Sustainable development, 'green' buildings and building rating schemes

1.2

Context: the full life cycle

What constitutes sustainable development from a commercial property perspective? This question generates a lot of discussion throughout the industry. (Definitions of sustainability are discussed in Section 1.1 of this Guide.)

Well-designed, enduring and environmentally friendly buildings, commonly referred to as 'green buildings', are not the sole expression of sustainable property. They are a culmination of a process which must recognise and generate added value throughout the full property life cycle. Sustainable property also encompasses the property's physical and social interaction with its surroundings and the communities upon which it has an impact.

There are many industry-generated design tools and building rating schemes and this section of the Guide refers to some of the Australian ones. Building rating schemes are also discussed in Sections 3.4 and 4.1, and see also Worksheet 4.1B: 'Choosing the appropriate environmental rating tool'.

Stakeholders' perceptions

The term 'sustainability' brings to mind a range of different perceptions and expectations from different stakeholders. The following perceptions are typical:

- **Traditional investors** view a property as sustainable if their investment continues to deliver sound financial results.
- **Ethical investors** consider the performance of a property as sustainable if it meets their environmental and social expectations, as well as providing a good return on investment.
- **Owners** consider their property sustainable if it continues to deliver against revenue targets, minimises its outgoings and grows in capital value, thereby being attractive to retain in the portfolio.
- **Designers** view sustainability as a performance area which demonstrates energy efficiency, good 'green' design, responsible material applications and achieves all users' requirements.

What's in this section

- **Tenants** view sustainability in the context of accommodation that provides a good indoor working environment for staff, efficient layout, reduces potential health risks and is accessible to public transport.
- **Regulators** consider a property sustainable if it exceeds occupational health, safety, fire and environment regulatory requirements and can be used to demonstrate sustainable design and construction to the market.
- **Local residential** or **business communities** associate a buildings' impact on its social, visual and physical amenity as a measure of sustainability.
- **Members of the general community** expect commercial property to 'do the right thing' and reduce its contribution to major environmental and social issues such as adapting to climate change and water conservation.

Sustainable property needs to satisfy all of these perceptions and expectations to be recognised in the market as truly sustainable.

Why does sustainability matter?

In Section 1.3 the potential impacts of climate change and global warming on the built environment are considered (IPCC 2007). But what of the impact of the built environment on climate change? To what extent is our commercial built environment exacerbating the effects of climate change and global warming?

Following is a summary from 'Capitalising on the building sector's potential to lessen the costs of a broad-based GHG emissions cut' – a report prepared for the Australian Sustainable Built Environment Council (ASBEC) by the Centre for International Economics, Canberra and Sydney, September 2007.

The building sector is responsible for a large proportion of Australia's GHG emissions – and can make a major contribution to meeting a deep cuts target

Without change, Australia's greenhouse gas (GHG) emissions will continue to grow at a rapid rate. They are currently projected to reach an estimated 915 million tonnes by 2050. However, the Australian Business Roundtable on Climate Change (BRCC) reported that it is possible to achieve a 60% reduction in GHG emissions by 2050 while maintaining strong economic growth, and that with early action, the economic impact by 2020 would be modest.

Almost a quarter (23%) of Australia's total GHG emissions are a result of energy demand in the building sector. The building sector, comprising residential and commercial buildings, houses a large proportion of Australia's economic activity. This study extends the

Principles for a sustainable commercial property market

In 2006, a Sustainable Building Leaders Project defined a set of principles that underpin the pathway to a sustainable property market:

- 'Business is not the enemy of the environment – it is a key player in solving environmental problems.
- Sustainability is not a cost burden for industry and consumers. It is an investment that will deliver not only public good outcomes for the environment but also improved economic performance for organisations.
- Sustainability is integrated into core business designs rather than an add-on after the core business decisions have been made.
- A sustainable market is an informed market that understands the economic, environmental and social costs and benefits of buying decisions over the whole building life cycle, and invests for long-term value.'

Sustainable Buildings Leader Project, Melbourne Business School, 2006, Building Commission Victoria.
For more information see www.buildingcommission.com.au/www/html/813-sustainable-building-pathway.asp

BRCC's analysis to include a more detailed analysis of the significant energy efficiency potential of the building sector. The building sector's contribution to GHG emissions is mainly driven by its end use of, or demand for, electricity. This is a key difference from many other sectors where the main issue is emissions from the supply of energy.

The building sector as a whole could reduce its share of GHG emissions by 30–35% while accommodating growth in the overall number of buildings by 2050. This can be achieved by using today's technology to significantly reduce the energy needed by residential and commercial buildings to perform the same services. For example, by replacing equipment with more energy efficient models, at the natural replacement rate, and upgrading the performance of the building shell.

Detailed 'bottom up' analysis of energy efficiency opportunities suggests that net cost savings can be achievable in the medium to long term. Rather than a cost per tonne of GHG abatement, many energy efficiency options have a positive financial payback in addition to providing abatement benefits. The payback period can vary from a matter of months to many years. This finding is consistent with a large collection of case studies within Australia and overseas.

The economy-wide analysis conducted in this study takes a conservative approach by using a cost neutral assumption rather than including any additional returns on energy efficiency investment that may be available.

Australian Sustainable Built Environment Council (2007)

Setting their own benchmarks

Several commercial property owners are setting their own performance goals. For example, in 2008 Stockland set a target of 8% reduction in electricity consumption and greenhouse gas emissions for its Australian office portfolio.

Stockland, www.stockland.com.au

National Greenhouse and Energy Reporting Scheme

The National Greenhouse and Energy Reporting Scheme (NGERS) was established in July 2008, in accordance with the *National Greenhouse and Energy Reporting Act 2007*. The scheme requires major power producers and consumers to record their emissions. Over the next three years, the emissions threshold for mandatory carbon accounting will reduce, requiring many major property institutions to report their energy consumption. The Australian Government's draft policy on emissions trading was released in December 2008.

NGERS fact sheet:
www.climatechange.gov.au/reporting/

Characteristics of sustainable property development

In order to be considered sustainable, property development and property management need to address the range of issues listed below – comprehensively and at an early stage in the development process. See Worksheet 1.2A for further explanation of these issues.

Landuse, urban form and urban quality

- Good urban design
- Good and attractive site design
- Reuse of land and buildings
- Appropriate density

Transport

- Convenient access to public transport
- Facilities for pedestrians and cyclists

Business and community

- Local labour and skills
- Local procurement
- Community involvement
- Community facilities
- Designing for community
- Equality and diversity
- Health and wellbeing
- Safety and security
- Accessibility

Environmental protection and enhancement

- Supporting biodiversity
- Avoiding and minimising pollution to air, water and land
- Noise abatement

Resources

- Energy efficient design
- Renewable energy
- Water conservation
- Low-impact building materials
- Minimising waste to landfill.

Attributes of 'green' buildings

Green buildings share common performance attributes which distinguish them from other buildings. These attributes include:

- being recognised or rated as part of a green building scheme such as the National Australian Built Environment Rating System (NABERS) or the Green Building Council of Australia's Green Star rating (see 'Green building rating schemes', below.)
- having energy and water saving action plans in operation, designed to make sure that energy efficiency and water efficiency performance levels are achieved and maintained, and greenhouse gas emissions are reduced
- having integrated building management systems with comprehensive metering that track and report energy, thermal, indoor environment quality and water use performance against agreed best practice benchmarks
- being a healthy place to work in with high levels of staff satisfaction and productivity

City Mayors join forces: C40

'C40 is a group of the world's largest cities committed to tackling climate change. Cities have a central role to play in tackling climate change, particularly as cities bear a disproportional responsibility for causing it ... cities consume 75% of the world's energy and produce 80% of its greenhouse gas emissions.

In 2005, representatives of 18 leading world cities met in London to discuss joining forces to tackle global warming and climate change. The representatives saw the need for action and cooperation on reducing greenhouse gas emissions and pledged to work together towards achieving that goal. At the end of the conference, a communiqué was signed which recognised the need for cities to take action and to cooperate on reducing climate emissions.

The cities also promised a number of action points, including most notably the creation of procurement policies and alliances to accelerate the uptake of climate-friendly technologies and influence the marketplace.

In August 2006, the initiative was further strengthened when former President Clinton and the former Mayor of London Ken Livingstone announced a partnership between the Clinton Climate Initiative and the Large Cities Climate Leadership Group (since then renamed 'C40'). This new partnership pledged to reduce carbon emissions and increase energy efficiency in large cities across the world.'

www.c40cities.org

- consuming fewer non-renewable resources compared to buildings of equivalent size and location
- producing less waste in construction as a result of an effective waste minimisation and recycling plan
- supporting the recycling industry during their operation through an active tenant-driven resource recovery and recycling program
- being located so as to maximise access by public transport, bicycles or alternate fuel vehicles
- discharging fewer emissions to the atmosphere, both at source and as a result of energy generation elsewhere
- causing minimal disturbance to site ecology and to neighbouring residential communities,
- contributing to the community's sense of place and general wellbeing.

In addition, truly sustainable buildings should maintain their place in the market and endure so they attract good income without the need for major expenditure for upgrade or maintenance, or in the extreme case, demolition and replacement.

Buildings that win awards for only some of these characteristics, typically greenhouse performance for example, should not be considered 'green', only greener than other buildings that have not achieved similar levels of performance.

Green building benchmarks

The Australian commercial property industry has yet to consolidate a set of agreed benchmarks that cover the whole range of sustainable development criteria.

For some aspects of sustainable development there are good practice or best practice benchmarks set by regulators, industry associations or utility providers. Examples of these are set out in Worksheet 1.2B. They can be used to benchmark commercial property from both a design and operational perspective. More detailed information about these benchmarks can be obtained from the promoters listed in the Worksheet.

Green building rating schemes are helping to establish a recognised set of design and construction performance levels which are suitable for a benchmarking excercise. Over time these ratings may become default benchmarks.

Green building rating schemes

Green building rating schemes are tools for evaluating the environmental performance of a building during design and occupation. In recent years the number of voluntary green building rating schemes has increased worldwide. Not all schemes deal with the same content nor do they all focus on the full property cycle. Some are suited to the design and construction stage and others to the building occupation stage.

There is not one scheme that is better than all the others across the whole property life cycle. Each tool has a viable role at a particular stage of the cycle, and can help to quantify or qualify various aspects of sustainable property development and management. **Across the schemes there is not a consensus about what constitutes sustainable development.** Rather, each scheme highlights aspects of sustainability and performance levels that are considered good or best practice and representative of sustainable development.

Consequently, the schemes have to be used intelligently and in a manner that is relevant to the particular application and its market. When properly understood, the rating schemes can provide helpful evidence to support the business case for sustainability as well as providing guidance to the project team.

In Australia, there are currently two rating systems available to communicate the sustainability of commercial buildings. NABERS, a government initiative to measure the performance of buildings, and Green Star, an industry initiative to encourage and promote sustainable building design.

NABERS

NABERS, the National Australian Built Environment Rating System, was developed and is managed by DECC on behalf of the Commonwealth, state and territory governments. NABERS ratings measure and compare the actual environmental impact of existing buildings.

To meet the different needs of building owners, managers and occupants, NABERS ratings are available for the base building, tenancy or whole building. Owners and managers can report on the environmental impacts under their control, such as energy use for lifts and air conditioning, water consumption and treatment of waste. Building occupants can report on the impacts of light and power in their tenancy, waste generation and separation of recyclable materials.

NABERS quantifies the environmental impact of a building, and benchmarks it against other buildings, awarding a rating out of 5 stars for each environmental impact criteria. A 2.5 star rating indicates average performance, while a 5 star rating represents a highly efficient building. A rating is calculated using 12 months data from the building in operation, such as energy and water bills. However, it is possible to commit to achieving a rating for a building that is under construction, through the Commitment Agreement process.

Benefits and outcomes of rating a building with NABERS include:

- quantifying performance – setting a baseline for improvements and tracking performance over time
- managing the environmental impacts of a building or an entire portfolio
- reliable, third party endorsement of environmental credentials
- reporting performance to stakeholders
- attracting tenants or potential owners
- demonstrating commitment to sustainability and good corporate citizenship.

NABERS ratings for offices include:

- NABERS Energy – previously known as the Australian Building Greenhouse Rating (ABGR)
- NABERS Water
- NABERS Waste
- NABERS Indoor Environment.

The NABERS Transport rating for offices is under development. NABERS also offers ratings for homes and hotels, and ratings for retail centres, schools and hospitals are under development.

Official ratings are supplied by NABERS Accredited Assessors. Ratings can be estimated using the online calculators, although a self-assessed rating cannot be promoted. For information on NABERS ratings, to find an Accredited Assessor or to try the online NABERS calculator, go to www.nabers.com.au

Green Star

Green Star is managed by the Green Building Council of Australia, a not-for-profit building industry organisation established to encourage the adoption of green building practices. A Green Star rating is awarded to buildings that demonstrate best practice or better sustainable design.

The following Green Star certified ratings are available:

- 4 Star Green Star (score 45–59): Best Practice
- 5 Star Green Star (score 60–74): Australian Excellence
- 6 Star Green Star (score 75–100): World Leadership

The following Green Star rating tools are available for offices:

- Green Star Office Design v3
- Green Star Office As Built v3
- Green Star Office Interiors v1.1

A Green Star rating is achieved by implementing design initiatives from a list of options covering a range of different environmental issues such as energy, water, transport and materials. Credit points are allocated based on the chosen initiatives.

The rating is calculated from the combined credit points achieved across all environmental issues, so can be achieved either by consistently good performance across all environmental issues, or by high performance in some areas offsetting lower performance in others.

A 6 star rating is achieved by a number of good building design initiatives. Certified ratings are only available to buildings that achieve 4 stars or greater. With careful construction, management, operation and maintenance, the initiatives chosen could lead to environmental benefits such as low energy and water use, and a healthy and comfortable indoor environment.

For more information on rating a building with Green Star, or becoming a Green Star accredited professional, go to www.gbcaus.org.au

Building Code of Australia

The Australian Building Codes Board (ABCB) is considering how to integrate sustainability into future versions of the Building Code of Australia (BCA) by recognising a broader spectrum of energy efficiency initiatives. The ABCB accepts the need to define sustainability within the construction industry and create an implementation framework for sustainability which supports the construction and property management industries. The ABCB also recognises the need to develop a strategy for sustainability education.

For more information about energy efficiency provisions for multi-residential and commercial buildings go to www.abcb.com.au/go/whatweredoing/workprogram/projectsae/energy/eecommercial

Section 3 of this Guide includes further detail on the general features and applications of the major green building rating schemes available in Australia.

Further information

- Green Building Council of Australia (GBCA) Green Star rating scheme, www.gbca.org.au
- National Australian Built Environment Rating System, NABERS, www.nabers.com.au
- Property Council of Australia, www.propertyoz.com.au
- IPCC 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M L Parry, O F Canziani, J P Palutikof, PJ van der Linden and C E Hanson (Eds), Cambridge University Press, Cambridge, UK, www.ipcc.ch
- 'Capitalising on the building sector's potential to lessen the costs of a broad-based GHG emissions cut', prepared for the Australian Sustainable Built Environment Council (ASBEC) by the Centre for International Economics, Canberra and Sydney, September 2007
- The National Greenhouse and Energy Reporting Scheme (NGERS) fact sheets and guidelines, www.climatechange.gov.au/reporting/

Worksheets

Review and use these Word documents:

1.2A Characteristics of sustainable property development

1.2B Environmental benchmarks

Worksheet 1.2A

Characteristics of sustainable property development

Use the following checklist to determine whether a property development could be considered 'sustainable'. This checklist is not a substitute for a design or operational performance rating scheme.

Land use, urban form and urban quality	Applicable?
Good urban design – creating precincts that are designed to encourage and facilitate safe pedestrian movement, link logically with surrounding areas and be complementary to those areas.	
Good and attractive site design – designed to meet the needs of the end users, with consideration given to how the buildings, infrastructure or open space will be used in practice, while (although subjective) also creating attractive spaces.	
Reuse of land and buildings – using a 'brown field' or contaminated site in preference to a 'green field' site. Reusing buildings on site, either by refurbishing all or part of a building or by recycling demolition material.	
Density – having the appropriate density for the location, such as high density around transport nodes, and minimising impacts associated with noise, traffic congestion and privacy.	

Transport	
Access-related issues – having good access to public transport, being situated close to local amenities.	
Active transport – providing for cyclists and pedestrians.	

Business and community	
Local labour and skills – encouraging or giving preference to local labour through the construction process or during the lifetime of the completed development. Providing training as part of the development process that will also help to increase the local skills base.	
Local procurement – (ideally) sourcing materials locally or through local suppliers where economically viable.	
Community involvement – creating interest and preferably buy-in from local stakeholders, achieved in part through community consultation and engagement initiatives over and above those required by the development approval process.	

Community facilities – including facilities for community use or designed for multiple users, helping to create a focus point for the community – could be the residential community as well as local business community.	
Designing for community – instigating processes which will facilitate a sense of community as the development matures. This includes considering how people interact and what generates a community, and providing space for people to meet socially and accidentally.	
Equality and diversity – designed to support social equality and cultural diversity. This is an important way of ensuring lasting sustainable development and is about fostering equality across the community through the development.	
Health and wellbeing – considering the quality of the indoor environment (see Section 3.8) and the impact this has on occupants. Aspects include providing natural and artificial lighting, reducing internal noise, managing internal air quality (ventilation and emission of pollutants) and maintaining services to avoid or reduce additional airborne contamination entering the building.	
Safety and security – designed to provide inherent safety and security including accommodation of mixed uses, overlooking walkways and car parks, encouraging ground level walk-through, and providing adequate night lighting.	
Accessibility – making the development accessible to a diversity of users including the disabled, mothers with young children, visually impaired and aged people. Much of this is subject to regulation and design codes, but sustainability can be improved through early attention to risks and opportunities during the design process.	

Environmental protection and enhancement

Supporting biodiversity – considering and conserving ecological values including locally, regionally and nationally important species as well as retaining or improving habitat values.	
Pollution to air, water and land – focusing on minimising, mitigating or avoiding polluting emissions during construction and operation.	
Noise abatement – recognising that the ambient noise of the area or within the site will affect the quality of life and health of the occupants and those that live or work nearby. Using design and operational controls to mitigate detrimental noise impacts.	

Resource use

Energy efficient design – taking advantage of the many technologies available to avoid energy wastage and track energy consumption during occupation. Efficient energy use is a key measure to reduce carbon dioxide emissions, thereby reducing the effects of global warming and climate change.	
Renewable energy – generating renewable energy onsite. This will reduce reliance on more carbon-intense, fossil fuel-derived energy sources.	
Water conservation – reducing the demand for potable water supplies and capturing and using rain, stormwater and wastewater. This may become mandatory for residential and commercial developments in the future. Current expectations focus on water efficient appliances and fittings, while new design ideas, including water sensitive urban design and water efficient technologies, are becoming more commonplace.	
Low-impact building materials – considering the life-cycle environmental impact of materials used in the development to maximise the use of environmentally friendlier alternatives and reduce burdens on virgin material sources.	
Minimising waste to landfill – in the design phase: reducing the creation of waste, using recycled or recyclable materials and supporting the recycling industry. In the occupation phase: instigating waste collection systems that help users to sort recyclable materials from residual waste which goes to landfill.	

Adapted from the *Sustainable Design and Construction Toolkit*, London Development Authority, prepared by URS Europe 2005, www.lda.gov.uk

Worksheet 1.2B

Environmental benchmarks

Emerging sustainable development benchmarks for commercial office buildings

Performance area	Emerging good or best practice benchmarks	Promoter
Energy efficiency (base building electricity and gas)	Sydney best practice **313 MJ/m^2 NLA pa**	Property Council of Australia 2001
	Melbourne best practice **333 MJ/m^2 pa**	
	Brisbane best practice **385 MJ/m^2 pa**	
	Canberra best practice **369 MJ/m^2 pa**	
	Adelaide best practice **556 MJ/m^2 pa** (whole building)	
	Perth best practice **558 MJ/m^2 pa** (whole building)	
	Australian CBD average **581 MJ/m^2 pa**	Australian Building Codes Board 2004
Greenhouse gas emissions (base building)	NSW/ACT best practice **71 kg CO_2/m²**	NABERS (5 star rating)
	Victoria best practice **101 kg CO_2/m²**	
	Queensland best practice **77 kg CO_2/m²**	
	South Australia best practice **72 kg CO_2/m²**	
	Western Australia best practice **70 kg CO_2/m²**	
	Northern Territory best practice **31 kg CO_2/m²**	
	Tasmania best practice **83 kWh/m²** (measured in energy)	
Water efficiency	Best practice **0.8 kL/m^2 NLA pa** Good practice **</= 1 kL/m^2 NLA pa**	Sydney Water 2005
	3 Star – **1 kL/m^2 NLA pa** 4 Star – **0.75 kL/m^2 NLA pa** (best practice) 5 Star – **0.35 kL/m^2 NLA pa**	NABERS
	Australian best practice **0.5 kL/m^2 NLA pa** Australian average **1.125 kL/m^2 NLA pa**	Department of the Environment, Water, Heritage and the Arts (DEWHA)
Air quality health goals – pollutant concentrations	Formaldehyde **130 [mu]g/m^3** Total VOCs **500 [mu]g/m^3** Carbon monoxide **9 ppm** (8-hour average) Nitrogen dioxide **225 [mu]g/m^3** Fine particules **50 [mu]g/m^3** Dust mite allergens **2-10 g/gram** house dust	National Health and Medical Research Council (NHMRC)

Performance area	Emerging good or best practice benchmarks	Promoter
Air quality health goals – pollutant concentrations (continued)	**NABERS thresholds:** Particulate matter (PM_{10}) **0.05 mg/m^3** Formaldehyde **0.10 mg/m^3** Carbon monoxide **10 ppm** Total VOCs **0.5 mg/m^3** Ratio of indoor airborne microbials to outdoor airborne microbials (measured as cfu/m^3) is **1**	NABERS
Solid waste	Total waste generated **≤149 grams/person/day** Total recycling of the materials generated **≥ 90%**	NABERS
PCA – *A Guide to Office Building Quality* – Environmental Performance	**Existing offices** **Premium** NABERS Energy accredited rating (See Note 1) Green Star (or similar) rating (See Note 2) **Grade A** NABERS Energy accredited rating Green Star (or similar) rating **Grade B** NABERS Energy accredited rating **New offices** **Premium** ≥ 4.5 star NABERS Energy accredited rating (See Note 1) ≥ 4 star Green Star (or similar) rating **Grade A** ≥ 4.5 star NABERS Energy accredited rating ≥ 4 star Green Star (or similar) rating **Grade B** ≥ 4 star NABERS Energy accredited rating ≥ 3 star Green Star (or similar) rating	Property Council of Australia
Proximity to public or alternate transport	**5%** of building occupants have access to secure bicycle storage on the property; **1** on-site shower for every 10 secure bicycle places; **1 km** or less walking distance to public transport during peak periods	Green Building Council of Australia

Note 1: Including publishing on NABERS Energy website and supported by a management plan

Note 2: Green Star Existing Office rating tool (or similar rating tool)

Property Council of Australia

The PCA provides a voluntary office building quality grading which includes environmental standards and other aspects of building performance that influence environmental outcomes. The following summarises the PCA's 2006 publication- *A Guide to Office Building Quality*.

Office quality grade matrix – environmental performance

	NABERS Energy accredited rating (Note 1)	Green Star (or similar) rating (Note 2)	Full BMCS including on-floor control	Main plant BMCS	Lighting power consumption ≤ 12 W/m^2	Lighting power consumption ≤ 15 W/m^2	Full building management team on site	Full building management team on site (> 30,000 m^2)	Remote building monitoring	Water demand submetering	Change room and showers	Waste recycling capability	4 star WELS-rated water fittings	Bicycle parking
	Existing offices													
Premium	●	●	●		●		●			●	●			
Grade A	●	●	●			●		●		●	●			
Grade B	●			●		●			●					
	New offices													
Premium	≥ 4.5 star	≥ 4 star	●		≤ 10		●			●	●	●	●	●
Grade A	≥ 4 star	≥ 4 star	●		●			●		●	●	●	●	●
Grade B	≥ 4 star	≥3 star		●		●			●	●	●	●	●	●

Note 1: Including publishing on NABERS Energy website and supported by a management plan

Note 2: Green Star Existing Office rating tool (or similar rating tool)

The PCA also provides the following listing of benchmarks for office building energy performance that are promoted as best current practice. It should be noted that other industry benchmarks, such as those being promoted by the Green Building Council of Australia, suggest more energy efficient standards are both achievable and desirable.

Best practice existing office building energy benchmarks (2001)

Location	Building type	Tenancy ($MJ/m^2/yr$)	Base Building ($MJ/m^2/yr$)	Whole Building ($MJ/m^2/yr$)
Sydney	All electric	225	313	538
	Gas heated	225	360	605
Melbourne	All electric	225	333	558
	Gas heated	225	444	669
Canberra	All electric	225	369	594
	Gas heated	225	518	743
Adelaide	All electric	225	331	556
	Gas heated	225	421	646
Hobart	All electric	225	321	546
Perth	All electric	225	333	558
	Gas heated	225	400	625
Brisbane	All electric	225	385	610
	Gas heated	225	430	655
Darwin	All electric	225	445	670

Source: Property Council of Australia's *Energy Efficiency Guidelines* 2001

For a breakdown of best practice energy consumption against key energy consumption area (HVAC, house light and power, lifts, hot water, tenant power etc., refer to PCA *Energy Guidelines* 2001 section 4).

Further information on the PCA's environmental initiatives can be obtained from www.propertyoz.com.au

Climate change, global warming and the built environment

1.3

Background

'Climate' is the average of prevailing weather conditions. Climate change is not new, as evidenced by ice ages that have occurred approximately every 100,000 years. However, human population growth and dependence on fossil fuels to support industrialisation have been influencing the emission of greenhouse gases since 1750, and it is well known that greenhouse gases have a warming effect (see Figure 1).

Reference: IPCC 2007a

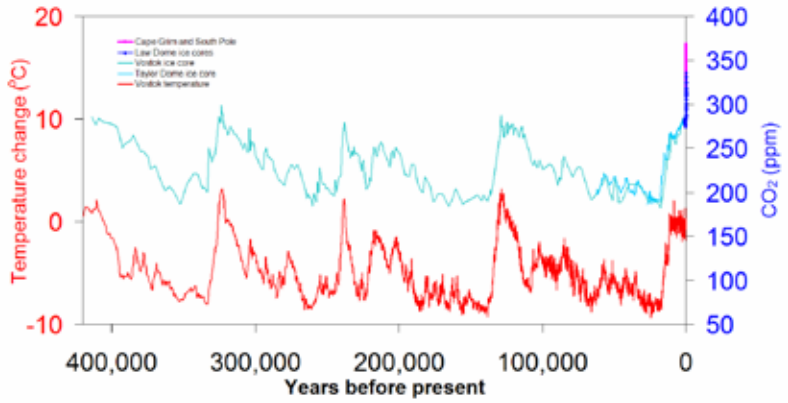


Figure 1: Global mean temperature anomalies, relative to present, and carbon dioxide concentrations (parts per million) over the past 420,000 years from ice core records. (David Etheridge, CSIRO, personal communication).

Reference: IPCC 2007a

Since the early 20th century there has been a global warming of about 0.7°C (Figure 2) and a rise in sea level of 17 cm. Most of the warming since the mid-20th century is very likely due to increases in greenhouse gases. Discernible human influences now extend to other aspects of climate, including ocean warming, continental-average temperatures, temperature extremes and wind patterns. There is a time lag in the effects of global warming: we are presently experiencing the consequences of accelerated carbon emissions from the 1980s.

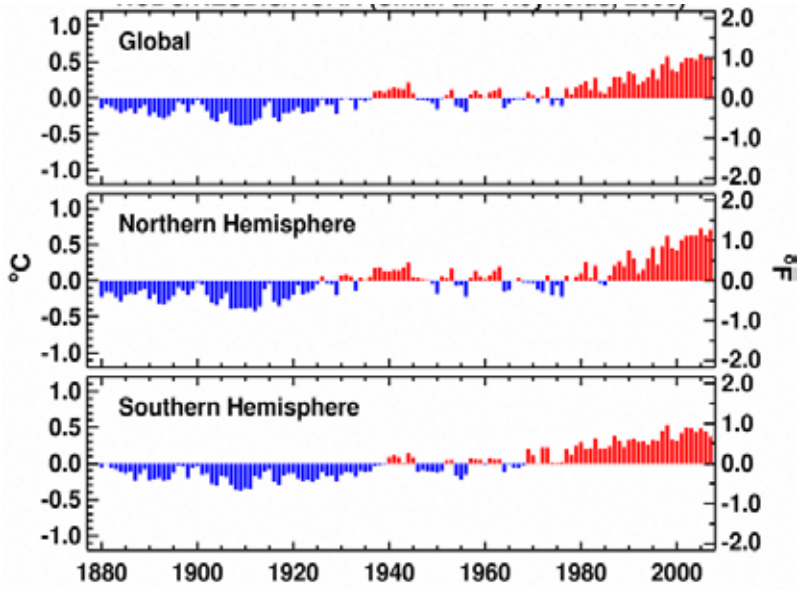


Figure 2: Mean temperature anomalies, relative to 1960–1990, for the global and both hemispheres from 1880–2007, www.ncdc.noaa.gov/oa/climate/research/2007/dec/global.html

In Australia, there has been a warming of about 0.9°C since 1950 (Figure 3), with less rain in the south and east and more rain in the north-west. The increased incidence of drought and wildfire in south-eastern Australia in the past 10 years is linked to drier and warmer conditions. This poses potential threats to both natural and built environments.

Reference: IPCC 2007b

Reference: Lucas et al. 2007

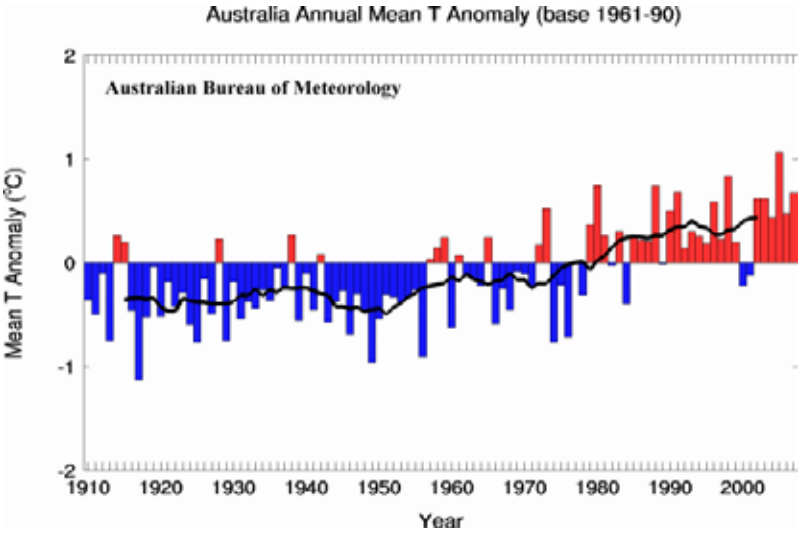


Figure 3: Australian mean temperature anomalies, relative to 1961–1990, from 1910–2007, www.bom.gov.au/climate/change/amtemp.shtml

Further global warming and sea level rise is anticipated. Projections for Australia include warmer and drier conditions, with more evaporation, more intense storms in some regions, longer and more intense droughts in some regions, more fires, stronger tropical cyclones, and less frost and snow.

Reference: IPCC 2007a

In 1900, the world's population was 1.65 billion; in 1950 it was 2.52 billion. For 2005, the estimate was 6.47 billion; in 2050 it is anticipated that there will be 9.08 billion people living on this planet. More people, less water plus carbon emissions reduction compliance are already having an impact on where we build, what we build, how we build, how we refurbish, how we fitout and how we maintain. This, in turn, impacts on the supply chain and the amount of embodied energy in the goods and services we transport, supply and purchase.

Reference: CSIRO & BOM

Reference: UN 2004

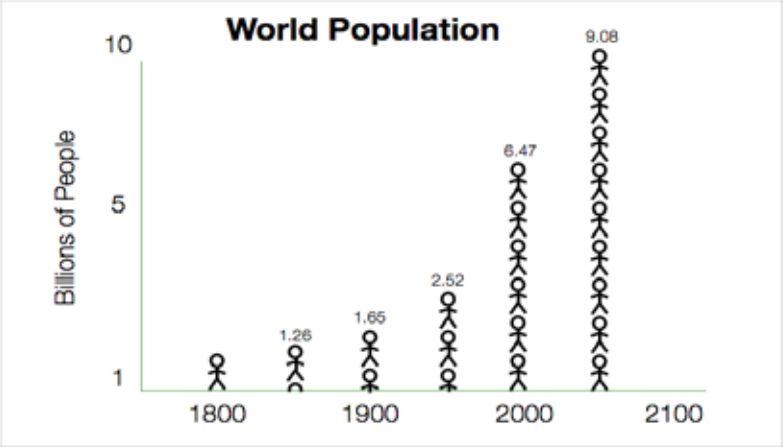


Figure 4: United Nations, World Population Prospects: The 2004 Revision

Potential impacts on the built environment

There are a number of potential impacts on the built environment:

Reference: IPCC 2007b

Buildings

- More fire and storm damage
- More coastal inundation due to sea level rise and storm surges
- Implications for property values and insurance in risky areas

Water

- Inadequate dam storage during droughts
- Inadequate stormwater capacity during floods

Energy

- Increased peak demand for air conditioning – possible black-outs

- Reduced demand for heating
- Reduced water supply for coal-fired power stations

Transport

- Road maintenance costs up 30% in Australia by 2100
- Inundation of road, rail and airport systems

Emergency services

- Greater demand due to more extreme weather

Value of sustainable property

The value difference between sustainable property and non-sustainable property will increase as environmental and social sustainability policies are upheld by all stakeholders while we work towards mitigating the impact of global warming and improving the working and living conditions in the built environment. There is increasing pressure to ensure that the environment within our buildings is healthy. We have been presented with an opportunity to 'get it right' and arrest the rate of carbon emissions that are warming our world to dangerous levels. See Section 2.4: 'Adapting to climate change' for information about responding to the risks and opportunities presented by climate change and global warming.

References and further information

- *IPCC 2007a:* *Summary for Policymakers in Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Avery, M. Tignor and H.L. Miller (Eds), Cambridge University Press, 2007, www.ipcc.ch
- *IPCC 2007b:* *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (Eds), Cambridge University Press, 2007, www.ipcc.ch
- *CSIRO & BOM:* *Climate change in Australia*, CSIRO and Bureau of Meteorology Technical Report, CSIRO and Bureau of Meteorology, 2007, www.climatechangeinaustralia.gov.au
- *Lucas et al.:* 'Bushfire weather in Southeast Australia, recent trends and projected climate change impacts', Bushfire CRC Melbourne, C. Lucas, K. J. Hennessy and J. M. Bathols, 2007
- *UN 2004:* 'United Nations World Population Prospects: The 2004 Revision', Environmental and Social Affairs, Population Division, United Nations, New York, February 2005, www.un.org/esa/population/publications/WPP2004/2004Highlights_finalrevised.pdf
- Australian Government Bureau of Meteorology, www.bom.gov.au

our environment it's a living thing

Department of Environment and Climate Change NSW

2

Becoming a Sustainable Organisation

Colonial First State

Global Asset Management

Department of Environment & Climate Change NSW

www.environment.nsw.gov.au

2.0

Section 2 overview

This section contains step-by-step guidelines for how to become a sustainable organisation – starting with the business case.

As you deal with the issues covered here you're likely to discover opportunities for innovation that could increase your competitiveness in the market. Even if the returns are mid-to-long term, these initiatives are fast becoming imperatives.

2.1 Building the business case for your organisation

Outlines how to develop and present the business case for sustainability initiatives at an organisational level.

Worksheet 2.1A Sustainability business case template

Worksheet 2.1B Which sustainability project? Evaluating the options

2.2 Implementing sustainability throughout your organisation

Describes the commitment required to develop awareness and accelerate behavioural change.

Provides a framework for integrating sustainability into business planning, and a model charter for supporting the organisation-wide activities of a Sustainability Committee.

Suggests initiatives for addressing real or perceived barriers to sustainability.

Provides a simple tool for identifying current capabilities in using sustainability as a catalyst for innovation.

Worksheet 2.2A Implementing sustainability: checklist

Worksheet 2.2B Sample charter for a Sustainability Committee

Worksheet 2.2C Innovation checklist

2.3 Developing a sustainability policy and strategic goals for your organisation

Outlines a step-by-step process for developing your sustainability policy.

2.4 Adapting to climate change

Outlines a step-by-step process for developing your organisation's response to the risks and opportunities posed by climate change, including joining an industry-specific greenhouse gas reduction program such as Greenhouse Challenge Plus or CitySwitch Green Office, and setting up your greenhouse gas inventory.

Worksheet 2.4A Risks relating to climate change

Worksheet 2.4B Opportunities arising from climate change

Building the business case for your organisation

2.1

Context

This section of the Guide deals with developing and presenting the business case for sustainability initiatives at an organisational level. The method suggested follows the approach you would use to develop other business case scenarios: quantify the value of the proposed initiatives and demonstrate their alignment with your organisation's business goals.

While some sustainability initiatives require behavioural change that will deliver value over a longer period of time, others may demonstrate returns in the short term (e.g. operational savings) and these can help to support the case for adopting sustainability initiatives. The environment will become a more prominent cost-related issue as resources become scarcer and the impacts of climate change become more apparent. As Australia moves towards a low-carbon economy, recognising and implementing sustainable practices is becomng an imperative for all businesses, including the property sector and its supply chain.

The way the business case is prepared and presented to senior management is critical. The financial return to the organisation will need to be stated, but this should be placed in context with other benefits relating to a range of business drivers – such as reputation and competitive advantage in the market. (For other drivers see Section 1.1 of this Guide.)

Look at similar processes commonly used by your organisation and keep your case consistent with other requests for investment commitment, in style, language and logic. This will make it easier for senior management to consider the pros and cons.

Key questions

1 What are the risks associated with the 'do nothing' option?

2 What are our competitors doing?

3 What do our internal and external stakeholders expect?

4 How can extra value be added?

5 Does the initiative clearly align with our corporate commitment and broader business goals?

What's in this section

Sustainability as the pathway

'Long-term sustainability practices are an integral part of Investa's business platform. These practices are measurable, accountable and enduring. Throughout our history we have proved that sustainability can be a pathway to efficiency, innovation and profitability.'

Investa Property Group, www.investa.com.au

Steps: Developing the business case

These steps are a guide only and should be modified as necessary. (Adapted from 'The Sigma Business Case Tool', Sigma Guidelines.) Worksheets 2.1A and 2.1B accompany these steps.

1 Identify your significant impacts

Identify your organisation's significant impacts on the environment, both direct and indirect, and the opportunities and risks they represent. Existing known or obvious impacts may be the best place to start. Make sure your review covers all aspects of your organisation's operations.

2 Identify stakeholders' and market perceptions and expectations

Consult stakeholders (including investors and tenants) about the key environmental attributes they expect from your organisation. Managing these perceptions and expectations is fundamental to reducing actual environmental impacts and will influence the ability to maximise opportunities, minimise risks and effectively promote outcomes.

3 Make it relevant

Link the opportunities and risks identified in Steps 1 and 2 to your organisation's core business. Use the organisation's business plan or strategic objectives to map interactions, influences and impacts on business objectives. Wherever possible, follow the language and structure of the corporate plans so your proposal is easily understood by the intended audience. Make sure the business case is fully aligned to your organisation's core purpose.

4 Identify and evaluate initiatives

Identify organisation-level initiatives based on practical and financial feasibility, attractiveness and ability to implement (see Worksheet 2.1B). Initiatives should focus on the highest risks or most attractive opportunities aligned to organisational goals. Identify the best delivery mechanisms.

5 Back it up

Provide examples, data and supporting information for each opportunity or risk, both from outside and within the organisation. Include direct financial costs and benefits. Consider indirect costs too, where they can be identified. Also identify longer term benefits which might incur a short-term cost.

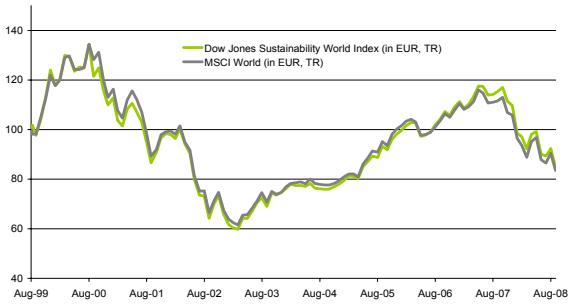
Demonstrating leadership through the stock market

'A number of Australian property companies are using market indexes to promote their sustainability commitment. Colonial First State Global Asset Management uses its listings on the Dow Jones Sustainability (World) Index and the UK's FT4Good to demonstrate value creation for investors. Colonial First State Global Asset Management maintains its listings through continual improvement in the sustainability performance of its buildings and management capabilities.

As an example, the Commonwealth Property Office Fund (CPA), through its submission to The Carbon Disclosure Project (CDP6), was selected for inclusion in the Goldman Sachs JBWere Climate Leadership Index. This recognition demonstrates the Fund's leadership in disclosure to the investment community across a range of investment-relevant climate change issues.

CPA was also recognised as the Leader for the Real Estate Investment Trusts Cluster in the AuSSI SAM Cluster Leaders 2008.'

Colonial First State Global Asset Management, www.cfsgam.com.au



Source: Dow Jones Sustainability Index

6 Keep it dynamic and updated

Make sure the business case is dynamic and develops as organisational priorities change and staff awareness increases. An up-to-date business case will help to communicate and raise awareness of the benefits of environmental improvement and remain relevant to the organisation's objectives. Review the outcomes and provide feedback for the next business case.

Issues to consider

Support your business case with key findings from local and international research that link sustainable development and green buildings to longer term business success factors. Other issues to consider include:

Brand and reputation

Brand value and reputation is the measure that appears to be most positively linked with sustainable property assets. The business case needs to recognise this form of value creation. A number of large Australian property trusts have promoted their sustainability performance and have gained in reputation as a result.

Multiple measures

The business case is strongest when multiple measures of business success are considered. Organisations are adopting a more holistic view of business success, considering both financial results and underlying financial drivers such as ability to attract ethical or responsible investors or tenants who value more sustainable buildings.

Business strategy

The business case is strongest when organisations incorporate sustainability performance into mainstream business strategy. Business case analysis should lead, rather than follow, a decision to improve an organisation's sustainability.

Sensitivity testing

The business case is likely to strengthen in coming years, based on current trends. Consequently, any business case analysis for improving property sustainability should be flexible, with results tested for sensitivity to various plausible scenarios.

Stockland's approach to becoming a sustainable organisation

Stockland has a company-wide commitment to act as a responsible corporate citizen encompassing responsibilities to its employees, communities, the market place and the environment:

'To deliver long term sustainable value to our security holders, corporate responsibility and sustainability principles are being integrated into all parts of our organisation. We understand that the value assigned Stockland by the market goes beyond conventional financial measures.'

Matthew Quinn, Managing Director Stockland, 2006 CR&S Report

Anticipating the market

'Investa was among the first property companies to recognise the impact that growing awareness of climate change and other environmental issues would have on the commercial office leasing market. Our performance in reducing energy consumption in response to the threat of climate change has become a genuine point of difference which tenants value. We are expecting similar changes to occur across our industry, including in volume housing.'

Investa Property Group, Sustainability Report 2007, www.investa.com.au

Work in progress

Current research is continuing to fuel the debate. There has been a lot of research into the benefits of better indoor environment quality (IEQ) and indoor air quality (IAQ) and the effect on occupant wellbeing, productivity and satisfaction. Use external evidence to supplement (but not drive) your own in-depth analysis.

Further information

- Australian SAM Sustainability Index, www.aussi.net.au
- *Green Value, Green Buildings, Growing Assets*, Royal Institution of Chartered Surveyors, UK 2005, www.rics.org/greenvalue
- *Building Refurbishment – Repositioning your Asset for Success*, Jones Lang Lasalle, 2005
- *The Dollars and Sense of Green Buildings*, Green Building Council of Australia, 2006, www.gbca.org.au
- The SIGMA Guidelines, www.projectsigma.co.uk/
- Global Environmental Management Initiative, www.gemi.org
- *Valuing Green, How Green Buildings affect Property Values and getting the Valuation Method Right*. The Green Building Council of Australia 2008
- 'Carbon management of real estate – a guidance note', Royal Institution of Chartered Surveyors 2008
- 'Financing and valuing sustainable property: we need to talk', Royal Institution of Chartered Surveyors 2007
- 'Commercial Property and Climate Change', Total Environment Centre Report 2007, www.tec.com.au
- 'Existing Buildings the Greenest Buildings', C Rousssac, Property Australia v2.1 no. 4 December 2006/January 2007, Property Council of Australia
- *The Costs and Financial Benefits of Green Buildings*, G Kats, 2003

Worksheets

Review and use these Word documents:

2.1A Sustainability business case template

2.1B Which sustainability project? Evaluating the options.

Responsible Investment and the Responsible Investment Certification Program

'The Responsible Investment Association Australasia (RIAA) is the peak industry body for professionals working in responsible investment in Australia and New Zealand. Almost every financial adviser, fund manager and consultant working in responsible investment is a member of RIAA together with many other professionals who work towards similar goals.

In September 2005, RIAA launched the world's first Responsible Investment Certification Program designed to assist investors to locate the products and services which best suit their financial needs and values.

RIAA's Certification Symbol is best described as a navigational tool which promotes informed choice and provides standardised information to allow consumers to compare and contrast the many responsible investment products and services now available in Australia and New Zealand.

Enlightened Self-Interest – Solutions for Responsible Investors

Launched in October 2007 by RIAA, the ESI slide show is an extensively researched presentation that uses photojournalism, testimonials from some of the world's largest pension fund trustees, cartoons, moving graphs and images and is accompanied by a detailed script.'

For more information see www.responsibleinvestment.org

Worksheet 2.1A

Sustainability business case template

This is an example only – adapt this worksheet to suit your organisation's requirements.

Opportunity name	A simple statement describing the opportunity, for example: Develop a sustainability strategy Engage internal stakeholders, including staff, and external stakeholders on sustainability issues
Brief description	Describe the scope of the opportunity, what the current situation is and what business outcomes are likely (financial and non-financial).
Relevant value drivers	What are the business drivers that influence the opportunity? Examples include benefits to the organisation such as improved reputation, improved marketability, engaged staff, reduced waste disposal costs, reduced workplace emissions, healthier indoor environment, increased operational efficiency, reduced transport costs, corporate and social responsibility, carbon reduction, value maintenance and improvement, etc.
Success indicators	How will success be measured? Examples include market perception of leadership, ability to attract ethical investors, operational cost savings, resource efficiency, improved building ratings, shorter letting up periods, etc.
Alignment with our goals and policies	How does the initiative demonstrate alignment with organisation values, business goals and other policies or strategies?
Research and analysis	What additional research or analysis will have to be done to ensure benefits can be realised? Examples include market research, life-cycle analysis, building services study, valuation advice, etc.

Suggested participants: internal stakeholders	Which service groups within the organisation will need to be involved? Examples include procurement, legal, operations, OH&S, environment, fund managers, property managers, etc.
External stakeholders	Will we need to engage with any organisations outside the company? Examples include managing agents, tenants, contractors, suppliers, local government, etc.
Potential actions	What specific actions will need to be done to further scope, evaluate or act on the opportunity?
Preliminary timeline	What are the time milestones?
Cost-benefit analysis	What is the cost of implementation? What are the financial benefits? What unquantifiable benefits are likely? What is the return on investment?

Source: Adapted from 'Forging New Links – Enhancing Supply Chain through Environmental Excellence', Global Environment Management Initiative 2004

Worksheet 2.1B

Which sustainability project? Evaluating the options

Use the following as a guide to evaluate the various options for sustainability projects.
This is an example only – adapt this worksheet to suit your organisation's requirements.

	Name of opportunity or project:
Feasibility	Are there significant obstacles or risks that could threaten the success of the initiative or opportunity?(list them)
	How straightforward would executing the project be, in terms of internal and external collaboration requirements?
	Can the project be delivered as part of a planned asset upgrade?
	What are the resources needs, both financial and human? Do we have the capacity to support the project?
	Would there be a financial return or payback on the project?
Attractiveness	Is the project well-aligned with the current strategic priorities of the organisation?

	Name of opportunity or project:
	Will this project be received enthusiastically by our customers and suppliers and other key external stakeholders?
	Are we likely to realise a significant improvement in the proposed indicators of value? Consider financial and reputation value.
Competency	Do we have the right set of project management and environmental skills and competencies in-house?
	Can we acquire the needed competencies externally? How easily? What expertise is needed? What are the selection criteria?

Source: Adapted from 'Forging New Links – Enhancing Supply Chain through Environmental Excellence' Global Environment Management Initiative 2004

Implementing sustainability throughout your organisation 2.2

Context

Different organisations embark on integrating sustainability in different fashions – there is no prescriptive off-the-shelf model for implementing sustainability within an organisation. Some take an incremental approach, making sure early wins are consolidated before undertaking more radical changes. Others find that a step-up change is effective, especially when other major changes are taking place such as a re-branding or a change in location. A common success factor for either approach is a strong commitment to change coming from the top of the organisation and the articulation of a clear direction for the organisation to head in.

Your organisation needs a clear vision of its ultimate sustainability objective in order to direct and allocate resources effectively. Having a vision will also enable you to identify multiple pathways and choose appropriate actions to achieve your sustainability goals. Your vision needs to include longer term thinking, underpinned by the short-term gains identified in your mission statement.

Once your organisation decides to adopt sustainability as part of its core business it will soon be apparent that this is a shared responsibility. The task will involve taking a range of stakeholders on the journey with you, including staff, suppliers, customers and investors.

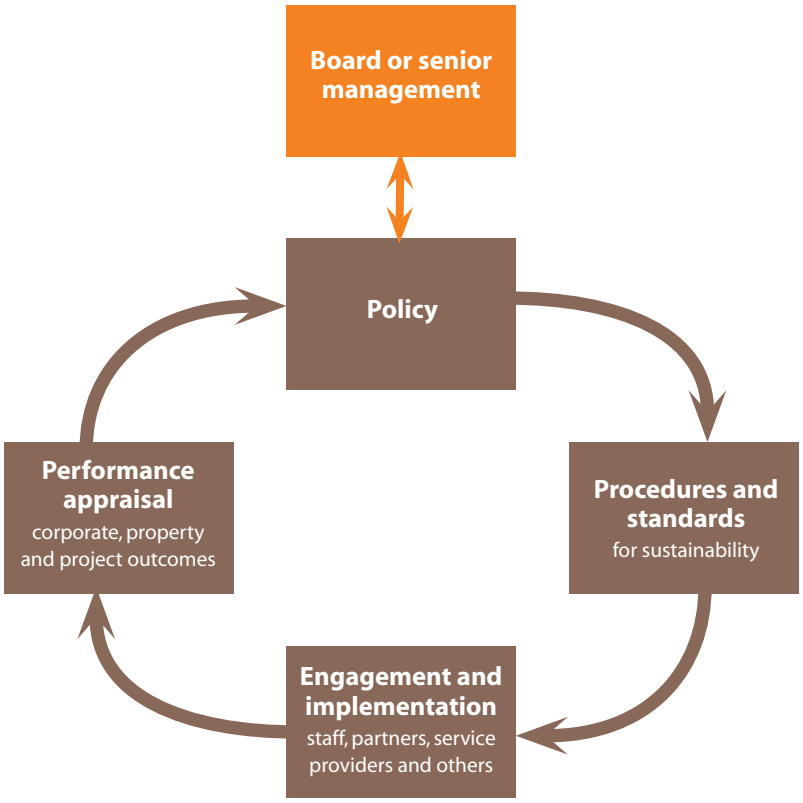
Integrating with existing systems

A systematic approach to sustainability has many elements in common with an efficient management or quality assurance system. For efficiency, credibility and ease of application, the objectives, procedures, evaluation methods and reporting tools for sustainability should be integrated into existing business systems, including those for asset management and project management.

The integration model in the following figure shows the basic steps in any performance management system. Policy is set by the executive then operating procedures are standardised and integrated into business activities. Outcomes are assessed and benchmarked for incremental improvement, and corporate direction and policy is periodically re-evaluated to check that opportunities and risks are being adequately addressed.

What's in this section

Sustainability integration model



Steps: Implementing sustainability

The following steps to implementing sustainability can be integrated into normal business planning and evaluation processes. These steps are also summarised in Worksheet 2.2A.

1 Gain commitment and establish responsibilities

Implementation has the greatest chance of success if it is clearly endorsed at senior management level. This is necessary to demonstrate commitment and support the business case, but line management responsibilities and accountability is essential for day-to-day implementation.

To demonstrate their company-wide commitment to sustainability some organisations have established specific Board committees and appointed executive-level managers with a mandate to drive corporate responsibility and sustainability. However, endorsement and acceptance needs to come from all business lines.

Specific responsibilities need to be allocated to an individual or several individuals or champions. Some of the Australian property organisations who have taken up this challenge have a dedicated Sustainability Manager (or similar role) and others appoint their environmental or risk advocate to take on a wider role.

Developing a sustainability road map

'Initially established in 2002, Colonial First State Global Asset Management (then Colonial First State Property) began a process to identify and implement a 'road map' that would enable the business to achieve improved environmental and social performance.

With the assistance of specialised sustainability consultants, Colonial First State Global Asset Management undertook the following process:

1 Conducting an initial situation analysis, to better understand the level of awareness and attitudes to sustainability within the organisation. This included one-on-one and group interviews across all levels of the organisation.

2 Identifying key gaps in knowledge and processes that could impede behavioural change and integration of sustainability into project delivery.

3 Developing a definition of sustainability that relates to the aims and values of the organisation, and internally promoting the concept of sustainability.

4 Developing a sustainability policy and strategy to guide future actions, including road maps and houseviews for various funds.

5 Developing a Sustainability Manual to foster consistency and focus across both in-house activity and work provided by key service providers such as managing agents and design teams.'

Colonial First State Global Asset Management, www.cfsgam.com.au

A Sustainability Manager should not shoulder responsibility for all activities that have an impact on the environment, workforce or the community. Their primary role should involve facilitation and behavioural change. In some organisations it may be feasible to create a dedicated position within each property trust or department. In either case their role would involve sponsoring projects, giving technical advice and carrying out monitoring and reporting.

Remember that while it is important to have clear accountabilities, everyone is responsible for adopting and implementing sustainability within your organisation.

Set up structures to maintain the commitment

Identify the best methods for coordinating and maintaining sustainability initiatives. This may be through direct responsibility and accountability by business unit managers, the fund manager or managing agents. You may decide to convene a corporate-wide Sustainability Committee to ensure momentum and commitment is maintained. Its role would be to coordinate implementation of an action plan, monitor progress and report to senior management. See Worksheet 2.2B: 'Sample charter for a Sustainability Committee'.

Alternatively, in smaller organisations, consider building onto an existing entity such as a risk or health and safety management forum, to benefit from their experience and acceptance within the organisation. Some sustainability initiatives may be able to piggy-back onto health and safety or risk initiatives but be careful as different skill sets may be required in each role.

2 Develop a sustainability policy

Identify and articulate your organisation's sustainability vision and goals. Refer to the business case. Develop and promote a sustainability policy aligned with business objectives and goals. Ensure the policy sets direction and allows business units to develop specific actions and performance targets which are integrated into their business and operational plans. Get executive level sign off to ensure credibility and accountability. Section 2.3 of this Guide outlines how to develop a sustainability policy for your organisation.

3 Engage staff

People are the essential factor in improving the sustainability of an organisation. Sustainable operations will happen when staff and contractors at all levels understand and engage in the challenging process of moving to more sustainable business practices. Seek input from staff at all levels of your organisation to guide this process and create ownership of the move to becoming more sustainable.

Characteristics of the ideal Sustainability Manager

- Motivation and 'passion' for sustainability.
- Broad expertise in sustainability, and technically proficient in some areas, but not necessarily a technical expert in building management or development.
- Involvement or close association with industry sustainability bodies to track new initiatives in sustainability.
- Excellent communications skills and an ability to relate to and show empathy with all levels of the organisation.
- Excellent written communications skills to support strategic development and business case arguments.
- Capacity to interpret and express, in the organisation's language, the external drivers and influences shaping the property sustainability agenda.
- Capacity to bring together skills and advice for those that need it.
- Willingness to engage with internal and external stakeholders to initiate or promote initiatives and reinforce company policies and requirements.

Can your organisation afford not to create such a role when there is such a high level of interest and activity in regard to sustainability in the commercial property sector?

Consult with staff regularly to find out:

- attitudes to sustainability-driven change
- levels of willingness and ability to adopt new or altered procedures
- levels of awareness of organisational direction.

4 Identify risks and opportunities

Awareness and policy alone is not an assurance of success. Investing in environmental improvement as well as employee behavioural change requires that the business case – that formed the basis for your organisation's adoption of sustainability in the first place – is kept up to date. (Section 2.1 of this Guide outlines how to build the business case.)

It is important to recognise the different ways of valuing the benefits. Not all initiatives will solely and directly result in operational cost savings or increased business revenue. Some will result in raised staff skills, capabilities, motivation and morale. Others will result in improved credentials in the marketplace and a distinct competitive advantage.

Identify risks to business goals

Review existing key performance areas the organisation uses to deliver its vision and goals. Do they cover environmental and social issues? If not, undertake a simple risk identification process to identify the relationship between stakeholder expectations on environmental and social sustainability and current capacity to meet those expectations. This will help to identify how sustainability can contribute to:

- mitigating key risks to the business
- capitalising on potential business growth opportunities.

Identify and analyse opportunities

Identify where value can be added through, for example, lower operating costs, increased capital value or tenant attraction and retention.

Work out which areas to tackle first in order to score some success as soon as possible, e.g. introducing energy or water efficiency initiatives in poorly performing properties (the 'easy wins'). This will help you win further support for developing a comprehensive sustainability strategy by proving the business case. Consider whether you should pursue your objectives across an individual portfolio or across all the organisation's activities.

Elicit help from a cross-section within the organisation to undertake this process and make sure all risks, levels of awareness, cultural barriers and key influences are identified.

Stockland's strategy

'We recognise that the concepts of corporate responsibility and sustainability are closely linked. Corporate responsibility means doing the right thing by our stakeholders and the environment. Sustainability is what our business achieves as a result.

To deliver long-term sustainable value to our security holders, corporate responsibility and sustainability principles are being integrated into all parts of our organisation. We understand that the value assigned to Stockland by the market goes beyond conventional financial measures.

For us, sustainability means more than good environmental stewardship. We take a wider view of sustainability. Our approach embraces our responsibilities to our employees, to our communities, to the marketplace and to the environment.

Our approach is underpinned by a company-wide commitment to act as a responsible corporate citizen and to conduct our business ethically and in accordance with best practice corporate governance principles.

Our culture is based on accountability and a willingness to consider what we should do rather than what we must do, balancing competing interests and priorities in day-to-day business.

To achieve our corporate responsibility and sustainability aims we have identified four themes:

- Maintaining ethical and responsible **marketplace** practices.
- Respecting and engaging with **our people**.
- Taking care of the **environment** in which we operate.
- Strengthening our place within the **community**.

Stockland, www.stockland.com.au

5 Develop a sustainability action plan

Develop a simple action plan that:

- outlines the initiatives you plan to implement, addressing the risks and opportunities you have identified
- sets objectives and targets
- establishes key performance indicators for each objective
- outlines how compliance with the policy will be demonstrated
- allocates responsibility and sets milestones and completion timeframes
- establishes an evaluation framework to measure progress and ensure knowledge is shared and acted upon.

The plan needs to reflect the structure of the organisation and its components e.g. property trusts, management companies related to property entities, etc.

Establish a baseline for current performance

Collect data on your organisation's current performance and establish baseline data from which to measure future improvements.

Benchmark the planned initiatives

Benchmark the proposed sustainability initiatives against those in similar organisations (e.g. domestic competitors, within-sector companies, etc.). Use this information to help determine which areas your organisation will focus on.

Benchmarking may help you to identify aspects of your operations that could help to differentiate your organisation from its competitors, or draw the attention of special customer groups such as ethical investment funds.

6 Implement the plan

Focus on changing behaviour

Promote behavioural change within your organisation and within its key external service providers. This will support the evolution of your organisation's culture so it views sustainability as business as usual. Reinforce and reward positive behaviour. Behavioural change can be facilitated by incorporating sustainability and environmental performance into key performance indicators (KPIs). Ensure each level of your organisation contributes to developing specific actions and KPIs relevant to their business objectives.

Conduct pilot projects

Implement and evaluate pilot projects, using both financial and non-financial key performance indicators.

Typical chain of command

Consider working in collaboration with other organisations or your supply chain partners to fund and deliver pilot projects.

Communicate intentions and progressive outcomes throughout your organisation. Identify and reward champions. Analyse successes and failures.

Expand the program

Seek management commitment to expand the program to areas where the greatest benefits (value creation) are possible. This may include implementing initiatives proven in the pilot projects across other business divisions, portfolios or funds. Identify and allocate appropriate resources. Consult both internal and external stakeholders to identify the next phase of initiatives. Make sure that any property or operational objectives within the expanded sustainability program are clearly in alignment with your organisation's strategic business objectives.

Develop and adapt tools

Identify needs, develop or adapt tools and review and align procedures that will help you to extend sustainability initiatives throughout all parts of your organisation. Build onto existing tools and procedures wherever practical, e.g. risk and OH&S frameworks. Make sure the tools are simple, easy to use, informative, flexible enough to accommodate varying needs across different business units, and that they add value to the activities of the business units. Ensure your tools are able to be separated when your sustainability program gains momentum.

7 Monitor stakeholders' expectations

Keep in touch with the expectations of your internal and external stakeholders. Use external parties to influence your organisation's performance. Seek regular opportunities to consult with key external stakeholders (investors, regulators, industry bodies, etc.) about their expectations and perceptions of sustainability performance and outcomes. This could be done using existing shareholder information questionnaires, focussed discussion groups or industry conferences and seminars.

8 Evaluate and report the achievements

Evaluate the program to identify strengths and weaknesses. Report and reward achievements, including progress against objectives, key challenges and targets. Present trend performance and clearly illustrate the benefits to your organisation, the environment and the communities involved.

Your tool kit

The tools may include some of the checklists and templates included in this Guide, adapted to suit the activities and culture of your organisation. Key tools could include measures to:

- assess property sustainability as part of asset management
- integrate and track sustainability objectives in development or refurbishment projects
- collate and report sustainability performance and outcomes to senior management.

Establish a path for continuous improvement

Being a truly sustainable organisation requires a commitment to continual improvement. Advances in technology, shifts in the market, and changes in behaviour and community expectations make for a dynamic and exciting journey. As part of the evaluation process ensure that the program is regularly reviewed to check effectiveness, relevance and the need for updating. Initially this could be every six months and then annually.

Tips for implementation

Know the key players

Identify and analyse the potential views of key internal stakeholders and decision makers. Make sure the sustainability business case addresses their concerns and potential arguments. Make sure you thoroughly understand the structure of your organisation and the real or perceived barriers that key players may present for discussion.

Start with small pilot projects

Some organisations can make radical shifts in their direction. For others this would translate to dislocation, resistance and backsliding. Everyone benefits from a more gradual approach – especially the sceptics. Small pilot projects give people a chance to refine their skills, discover what works and what backfires, identify problems and cope with them, and – above all – learn that the new approach is survivable after all.

Promote the 'easy wins'

Identify some of the quick wins and use these as examples in a cost-benefit analysis of implementing an environmental sustainability strategy. For example, water and energy efficiency initiatives are usually easily identified and costed.

Retain knowledge

Have in place a system to collect and retain business, property, portfolio and general sustainability knowledge, as well as basic utility usage data. The system needs to be readily accessible and updated. If necessary centralise this database so its use can be easily coordinated.

Use full cost accounting

When evaluating the financial costs and benefits of environmental sustainability remember to identify, quantify and allocate the direct and indirect environmental costs of ongoing company operations. Remember to reinforce the non-financial benefits, such as reputation and staff satisfaction. See Section 3.1 for further information about full cost accounting.

Describe the change as a change

If you tell your employees and colleagues that the new strategy or policy is just a continuation of the old strategy or policy, you can't be surprised when they continue old behaviours … 'they didn't really mean the last three environmental policies – why should I think they mean this one?'

Send signals that say you mean it

People who function well within complex organisations are adept at distinguishing the instructions they are supposed to take seriously from the instructions to they can take less seriously. Ensure the signals and directives are clear and make people accountable. These could become key performance indicators (KPIs) to be used in performance assessments.

Match rewards and incentives to the new goals

Ultimately, people do what benefits them, not what benefits the organisation. Make sure the rationale for sustainability actions clearly demonstrates the pay-off, for people and for the organisation.

Don't blindside anyone

Like external critics of your organisation, internal critics of sustainability need to be engaged in the dialogue. Blindsiding senior management is especially risky because top management can shut you down.

Assess the internal communication climate

How can you level with a local environmental group when you are reluctant to level with your own top management? Either the external successes will set a standard that undermines the old internal norms or, more likely, the internal norms will set a limit on what anyone is willing to try externally.

Pay attention to your own scepticism

Like individuals, organisations change in stages, not at once. Policies change before practices, and practices change before attitudes. When an organisation is in flux, it is easy to find inconsistencies: polices that are not borne out in practice, practices that are belied by attitudes. Small wins in attitudinal change will deliver incremental change over time.

Engage your supply chain

Make sure your supply chain – both contractors and product suppliers – understands your aspirations and responsibilities in regard to becoming a sustainable organisation. Contractors and suppliers are an integral component of many aspects of sustainability.

Promote sustainable practices and seek opportunities to work in collaboration with key supply chain members (e.g. cleaners, managing agents, design teams, etc.) on sustainability initiatives that provide value to all organisations involved. See Section 5 of this Guide for more information about working with your supply chain.

Develop the capacity to innovate

Sustainability presents both an innovation challenge (how can we innovate?) and opportunity (how quickly can we apply it?). Innovation can be approached incrementally or radically:

- Incremental innovation is driven by 'market-pull' factors which can require non-technical activity such as improving the supply chain, developing awareness, introducing performance contracts or consulting industry experts, etc.
- Radical innovation tends to be driven by 'technology-push' factors such as new construction processes or diagnostic systems for buildings. (Brite Innovation Project 2004–2007.)

Both approaches deliver results. Organisations need to ensure they have the right organisational skills, in addition to access to technical skills, to successfully manage the innovation process. Worksheet 2.2C provides a simple checklist to help your organisation assess and improve its ability to innovate.

Further information

- The SIGMA Project Implementation Toolkit, www.projectsigma.co.uk/Toolkit/
- BRITE Project, Innovation Case Studies, www.brite.crcci.info
- Cooperative Research Centre for Construction Innovation, www.construction-innovation.info

Worksheets

Review and use these Word documents:

2.2A Implementing sustainability: checklist

2.2B Sample charter for a Sustainability Committee

2.3C Innovation checklist

Worksheet 2.2A

Implementing sustainability: checklist

Steps (summarised from Section 2.2)		✓
1	Senior management has confirmed its commitment, and responsibility for sustainability has been assigned to an individual or team. The management structure is in place.	
	A **Sustainability Committee** (or similar) has been established to coordinate implementation, monitor progress and report to senior management – and in doing so maintain the momentum and commitment.	
2	The organisation's **sustainability vision and goals** have been identified and articulated.	
	A **sustainability policy** – aligned with business objectives and goals – has been developed and promoted.	
3	Staff, consultants and contractors have been consulted and are engaged with the process.	
4	The business case has been reviewed and will be kept up to date.	
	Risks to business goals have been identified.	
	Opportunities have been identified. The areas to tackle first have been determined, so as to achieve easy wins and increase support for sustainability.	
5	A simple **sustainability action plan** has been developed – outlining actions to enact the policy across relevant business areas.	
	Sustainability initiatives have been benchmarked against those of similar organisations (e.g. domestic competitors, within-sector companies).	
	Performance data has been collated to establish a baseline.	
6	Behavioural change is being promoted and the organisation's culture is evolving towards sustainability. Positive behaviour is reinforced and rewarded.	
	Each level of the organisation has contributed to developing specific actions and KPIs relevant to their activities and aligned with the organisation's goals.	
	Pilot projects have been implemented, measured and evaluated. Progress and outcomes have been communicated throughout the organisation. Successes and failures have been analysed. Collaboration with other organisations and supply chain partners has been considered.	
	Management has made a commitment to expand the program and provide appropriate resources. Internal and external stakeholders have been consulted to identify the next phase of initiatives.	
	Tools and procedures have been developed (aligned with existing practices) to help extend sustainability initiatives throughout the organisation.	
7	Internal and external stakeholders are being consulted about their requirements and expectations.	
8	Achievements are reported, including progress against objectives, challenges and targets.	
	The path for continuous improvement has been established.	

Worksheet 2.2B

Sample charter for a Sustainability Committee

This is an example only – adapt this charter to suit your organisation's requirements.

Date of this charter:

The Committee's purpose

In response to the emerging importance of sustainability within the commercial property industry, the Sustainability Committee's purpose is to provide a structured advisory forum to deal with the issues and opportunities relating to sustainability.

The Committee will look at how sustainability is relevant to this organisation and what its potential impacts may be—knowledge that will enable us to work out what types of strategies and initiatives we will need to implement in order to remain competitive.

The Sustainability Committee's charter is to evaluate, develop, promote, implement and monitor sustainability principles and practices through the organisation which will deliver value to our investors, tenants and clients, while:

- using resources in an efficient manner
- anticipating and managing risks and opportunities across all levels of business
- meeting stakeholders' expectations in regard to economic, social and environmental performance.

The Committee's function

- Review the emergence of sustainability within the commercial property industry and identify trends which may have an impact on the organisation's long-term viability.
- Examine current standards and procedures that encompass corporate sustainability and measure these against organisation policy and industry best practice.
- Where shortfalls exist between current and best practice, evaluate the case for adopting best practice within relevant business units.
- Look for opportunities to better promote the organisation's policies and progress with implementing sustainability to the property market.
- Provide advice to business unit managers to help them build business cases so they can acquire the resources and expertise to implement sustainability initiatives.
- Report to senior management (and provide information they need to report to the executive) on recommendations for implementing additional sustainability initiatives within the organisation.
- Where appropriate, set up and coordinate a team of volunteers to champion workplace sustainability awareness and activities (e.g. waste recycling, energy management and procurement).
- Consult with the personnel who are responsible for implementing and managing the organisation's sustainability policy.

Membership and responsibilities

- The Committee will be made up of no less than [XX] nominated personnel from various business units so that it is representative of the whole organisation.
- Committee membership will be reviewed annually.
- The role of the Committee Chair is to run the meetings and make sure they proceed within the allocated time and in accordance with the agenda. The Chair will also be responsible for reporting and making recommendations to senior management.
- The role of Committee Secretary is to prepare the meeting agenda, arrange times and venues for meetings and recording and distribute minutes.

Committee's authority—an advisory body

- The Committee has the power to make submissions and recommendations to senior management (and the executive) on matters of sustainability, including directions, actions, initiatives, policies and measures.
- The Committee has the power to request and obtain information (and the analysis of that information, including necessary research) from other business units.
- The Committee does *not* have the power to direct expenditure, commission or wind-up specific sustainability initiatives or adopt particular directions etc., unless specifically empowered to do so by senior management or the executive. Therefore the Committee is first and foremost an advisory body.

Non-committee members

Guests may attend meetings by invitation of a Committee member if this is approved by the Chair. Guests will remain neutral and observe correct protocols during Committee meetings.

Frequency of meetings and quorum

The Committee will meet at six weekly intervals in accordance with arranged times, or as otherwise directed by the Committee Chair. A minimum of [XX] representatives from the Committee will constitute a valid meeting of the Committee. If a Committee member is unable to attend a meeting, they must nominate a 'stand in' to attend on their behalf.

Agenda

The agenda for Committee meetings will address the following issues:

- minutes from previous meeting
- status of action items from previous meeting
- status of sustainability initiatives
- general business.

The agenda will be distributed no less than three business days before the meeting.

Source: Colonial First State Global Asset Management 2004

Worksheet 2.2C

Innovation checklist

The following checklist may help you to pinpoint

- where your organisation is now, and
- where it wants to be in the future

with regard to developing capabilities and opportunities to innovate through sustainability.

	I haven't thought about it	I am thinking of doing something	Yes	Yes, and we are constantly improving	Yes, we represent best practice
	Level 1	Level 2	Level 3	Level 4	Level 5
Do you have strong relationships with industry participants who are recognised for their sustainability achievements? (e.g. clients, builders, suppliers, designers, academics, PCA etc.)					
Are you willing and able to partner with investors, tenants or service providers to achieve longer term outcomes?					
Do you actively monitor national and international best practice in commercial property sustainability?					
Do you actively monitor advances in related industries that might be applicable to your business? (e.g. residential property, ethical investment, construction and building etc.)					
Do you have a formal system for transferring project learning into your continuous business processes? (e.g. sustainability management plan, knowledge transfer program etc.)					
Do you view problems and failures as opportunities for learning and growth?					
When you make changes, do you measure how well the changes have worked? (feedback on outcomes)					
Are staff rewarded for maintaining networks with other industry participants with complementary skills?					
Are staff encouraged to share ideas, particularly between portfolios or projects?					

	I haven't thought about it	I am thinking of doing something	Yes	Yes, and we are constantly improving	Yes, we represent best practice
	Level 1	Level 2	Level 3	Level 4	Level 5
Do you have a strategy to keep the loyalty of key experts and achievers within your organisation?					
As your organisation and its business environment changes, are you bringing in the necessary new skills and competencies?					

Evaluating your response

When evaluating your response, consider the following:

Level 1: Is it in our business interests to ignore these activities?

Level 2: Am I putting in the effort or resources needed to support these activities?

Level 3: Which of these activities should I make even better?

Level 4: How can I identify the strengths on which to build and improve even more?

Level 5: How can I capture and share these successes?

Source: This was closely modelled on checklists appearing in 'Innovate Now' by Dr Karen Manley, BRITE Project, Cooperative Research Centre for Construction Innovation (www.brite.crcci.info). Rating system devised by Construction Excellence (www.constructionexcellence.org.uk)

Developing a sustainability policy and strategic goals for your organisation

2.3

Context

This section provides a simple framework for developing and implementing a sustainability policy within a commercial property business. A range of environmental, social and economic considerations combined define true sustainability.

Your sustainability policy will establish an overall direction and set parameters for action. It will define and standardise the concept and set the overarching goal for the level of environmental, social and economic sustainability performance against which subsequent actions will be judged. In the context of this Guide, social sustainability includes workplace performance and community engagement and support.

The process outlined below can be adapted to suit the practices your organisation uses to establish commitment, track implementation and review relevance and alignment with corporate goals; that is, to establish your mission in order to facilitate your vision.

When preparing your sustainability policy you need to consider the expectations of both internal and external stakeholders. While most policies are designed to drive cultural and behavioural change within organisations, they can also be useful tools for demonstrating an organisation's commitment to its external stakeholders.

Because it will have a whole-of-business application, both environmental and social aspects of your sustainability policy need to be developed and implemented with reference to the other policies that influence business decisions, in particular risk management policy, OH&S policy, procurement and ethics policies.

What's in this section

Steps: Developing and implementing your policy

These steps have been adapted from the Eco-Management and Audit Scheme (EMAS) Toolkit for SMEs (see Further information, p6).

1 Get commitment from senior management

Ensure senior management has given clear authorisation to proceed. Management will need to allocate time and resources and should also set a basic timeframe.

Confirm who will sign the policy. Ideally this should be the CEO, Managing Director or Chairperson. This is better than endorsement solely by senior line managers because it will enable widespread support for the policy across your organisation.

2 Get organised

Assemble a small team – including key people from a cross-section of the organisation – who will promote the policy internally and provide support, advice and peer review. Nominate a leader who will be responsible for drafting the policy and shepherding it through to full endorsement.

Prepare a timeline which allows for preparing the draft, gathering input from employees, presenting and discussing it with senior management, finalising the policy and communicating it to all employees.

Review the organisation's existing policy statements. There may be aspects of environmental commitment in other policies or vision or mission statements, or even values statements. The sustainability policy could be a stand-alone document or could be integrated with health, safety, quality management or other policies.

Review the environmental and social sustainability policies of other organisations in the property industry or leaders in other industries. See how others use their policies to reflect their organisation's risk profile and culture. Policies have a unique fit within their organisation. Access training courses such as the one offered by the Total Environment Centre's Green Capital initiative (www.greencapital.org.au). Participants gain the tools required to foster a culture of sustainability in their organisation.

Sustainability Advantage

Sustainability Advantage is a business support service from the Department of Environment and Climate Change NSW (DECC). It is designed to help businesses understand sustainability, successfully manage their operations to achieve better environmental outcomes and add business value.

Sustainability Advantage participants have the option to undertake a Vision, Commitment and Planning module. With the support of DECC and their contractors, management participates in workshops which allow them to:

- understand sustainability and the environmental impacts of the organisation's value chain
- draft a vision and long-term goals for sustainability
- draft strategic actions, key performance indicators, budgets and reporting mechanisms
- explore how to integrate sustainability plans into current business plans.

For more information please contact Business Partnerships on (02) 8837 6000 or sustainbus@environment.nsw.gov.au

3 Define the scope and engage others

Identify and prioritise your organisation's potential environmental and social impacts through a risk assessment process. Look for opportunities or outcomes that could support a higher level of environmental and social performance.

Confirm, through a consultative session with senior management, the key goals the organisation wishes to achieve with respect to managing the priority risks and capitalising on potential opportunities.

Consider where the organisation wants to be in relation to environmental and social performance in the next one, two or five years and whether its wants to be seen as a leader among its peers or a competent follower (both have advantages). Include the sustainability impacts of both the services the organisation provides its customers and clients and of the organisation itself.

Review opportunities to set milestones and targets against key performance indicators. Targets can be qualitative or quantitative and should pass the SMART test. (S–specific, M–measurable, A–achievable, R–repeatable, T–time-defined.) In particular, consider the organisation's capacity to monitor and collect data against some quantitative targets such as resource use efficiency. Although a statement of intent to comply with regulatory requirements is necessary, limiting intentions to this may restrict the organisation from achieving outcomes that some stakeholders may expect.

Solicit key internal stakeholders' views regarding potential aspirations, goals and implementation issues. This will help to foster participation and ownership. Consider three basic questions:

- Why are we committed to the environment?
- What are we trying to achieve?
- What can we actually do to reduce adverse social or community impacts?

Consider asking a select group of external stakeholders about their expectations of the level of environmental and social performance the organisation should be achieving or aiming towards. These stakeholders could include valued customers, investment analysts and key groups from the community in which the organisation operates.

If possible, find out your competitors' environmental and social commitments so you know what you may be being compared to.

Targets should be:

S Specific ✓

M Measurable ✓

A Achievable ✓

R Repeatable ✓

T Time-defined ✓

4 Draft the policy

Prepare the first draft of your sustainability policy. Try and limit it to one page. Good practice suggests your policy needs to include:

- your organisation's desired environmental, social and community goals and objectives within the context of its vision, core values and guiding principles
- a commitment to continual improvement and to preventing or minimising adverse environmental and social impacts
- a commitment to complying with relevant environmental and workplace legislation and regulations, and with other requirements the organisation subscribes to
- adequate reference to or recognition of the nature and scale of the environmental and social impacts of the organisation's activities, products or services
- a framework for setting and reviewing environmental and social objectives and targets; where practical and desirable, targets or milestones should be achieved over a specific period
- a commitment to raising awareness and training employees
- a commitment and framework for engaging with stakeholders including employees and key external stakeholders
- a commitment to regularly monitor and report performance to internal and external stakeholders.

Review the draft sustainability policy against commitments and statements in other organisational policies and confirm there is no conflict or potential for confusion. Policies need to support each other and demonstrate their alignment with the organisation's values and broader business objectives.

5 Consult, review and finalise the policy

The draft should be presented and discussed at the highest levels of management. If managers accept the idea of continual improvement this can avoid problems later on. Consider a select review by line managers and other employees. Use existing forums and communication channels wherever practical.

6 Get approval from the top

Make sure the final policy is signed and dated by the most senior person in the organisation. This is also a good time to confirm which individual or management level is responsible

Establishing a sustainability policy at Colonial First State Global Asset Management

'Colonial First State Global Asset Management (CFSGAM, then Colonial First State Property) developed a sustainability strategy to help map its progressive implementation of sustainability practices. One of the first deliverables promoted to staff was a sustainability policy which complemented existing environment, OH&S and risk policies.

A draft was prepared with internal and external assistance and circulated among senior management before being adopted by the Chief Executive. The policy defines sustainability in the context of CFSGAM's business. Its commitment includes:

- taking a longer term approach to investing intellectual capital into integrating and managing sustainability
- setting specific objectives and targets
- fostering a culture of sustainability awareness
- seeking to optimise returns on sustainability investments
- identifying and promoting the long-term benefits of sustainability.

The initial sustainability policy was established in 2003 and is reviewed and updated regularly. Monitoring and reporting progress against the policy is also ongoing and provides a critical opportunity for the business to understand the success of implementation.'

Colonial First State Global Asset Management

for reviewing the effectiveness of the policy and reporting back to senior management.

7 Communicate the policy

All employees need to know about the policy and understand their responsibilities in complying with it. The Chief Executive Officer or Managing Director should initially communicate the policy and reaffirm commitment to it. Make sure all those who contributed to the policy are sent a copy, and include an appreciation of their involvement. Use regular forums, the staff intranet and notice boards to present the policy.

Where required, communicate the policy to key suppliers if their environmental performance needs to reflect your organisation's aspirations and commitments. Expect commitment from them and develop a process to measure whether they are able to meet your sustainability criteria.

Ideally the policy should be accessible to the public and other external stakeholders, usually via the organisation's website. Part of the commitment to improvement involves recognising and accepting transparency, both internally and externally. Consider including the policy in communications with key stakeholders e.g. in the annual report.

Reviewing your policy

Identify a process – ideally within an existing audit or management review system, or through an Environmental Management System or similar – for regular reviews of the policy's effectiveness, relevance and need for updating. This could be conducted in conjunction with any other strategic review or planning exercise the organisation undertakes on an annual basis.

The review needs to check that commitments contained within the policy, and its implementation within the organisation, remain consistent and supportive of the organisation's business goals and strategic direction.

Consider the following questions:

- Are employees at all levels aware of the policy and do they understand its basic intent?
- Do employees know how to access the policy? Is the policy serving as a guide for employees?
- Is the policy working at the day-to-day operational level?
- Is the policy working outside the organisation? (with suppliers, contractors and customers etc.)

- Are the policy's goals still perceived as credible, relevant and supportive of the organisation's business goals?
- Has the policy been followed up by actions and initiatives in key business areas?
- Can we demonstrate achievements linked to implementation of the policy – in the short, medium and longer term?
- Does any aspect of the policy need to be changed?

Make sure the policy is promoted at regular opportunities, and that awareness of the policy is included as part of the annual performance reviews of key staff. Recognise and reward internal and external sustainability champions.

Further information

- 'Guide for Writing an Environmental Policy', Department of the Environment and Water Resources, www.environment.gov.au/settlements/government/ems/publications/pubs/policy.pdf
- 'Developing a Sustainability Strategy: A ten-point guide for small to medium sized businesses', National Centre for Sustainability, Swinburne University of Technology, http://tool.ncsustainability.com.au/assets/sustainability_strategy.pdf
- 'Sustainability Action Plan', National Centre for Sustainability, Swinburne University of Technology, http://tool.ncsustainability.com.au/assets/action_plan_template.doc
- 'ISO 14000 essentials', international standards for environmental management systems, www.iso.org/iso/en/prods-services/otherpubs/iso14000/index.html
- Global Reporting Initiative (GRI), www.globalreporting.org
- 'Environmental Policy Checklist', International Network for Environmental Management (INEM), http://www.inem.org/default.asp?Menue=154
- 'EMAS Toolkit for small organisations', Eco-Management and Audit Scheme (EMAS), http://ec.europa.eu/environment/emas/toolkit/
- The SIGMA Project, www.projectsigma.co.uk/

Adapting to climate change 2.4

Context

Adapting to climate change is fast becoming an imperative for the property industry as governments define Australia's low-emissions future in response to global warming. Commissioned by state and Federal governments, the *Garnaut Climate Change Review* aims to raise public and industry awareness about the need to reduce carbon emissions as we move towards a carbon pollution reduction scheme (CPRS). See www.garnautreview.org.au

The National Greenhouse and Energy Reporting Scheme (NGERS) began in July 2008, in accordance with the *National Greenhouse and Energy Reporting Act 2007*. The scheme requires major power producers and consumers to record their emissions. Over the next three years, the emissions threshold for mandatory carbon accounting will reduce, requiring many major property institutions to report their energy consumption. The Australian Government's White Paper on emissions trading was released in December 2008, although the introduction of mandatory obligations under the Carbon Pollution Reduction Scheme has been deferred until 1 July 2011 (see www.climatechange.gov.au/emissionstrading/index.html).

In Section 1.3 climate change and global warming are defined and potential impacts on the built environment are identified. Predictions by the Intergovernmental Panel on Climate Change (IPCC) include:

- more fire and storm damage
- more coastal inundation due to seal level rise and storm surges
- implications for property values and insurance in risky areas.

The table on page 2 is a summary of adaptation options from the Australian Greenhouse Office's *Assessment of the Need to Adapt Buildings for the Unavoidable Consequences of Climate Change*, August 2007. Management and adaptation to the physical effects of global warming on the built environment must be embraced in conjunction with management and adaptation to a changed economic environment, that is, dealing with economic impact in a carbon-constrained economy.

What's in this section

Climate change adaptation options

Climate change impact	Residential buildings	Commercial buildings	Health and lifestyle needs
Increased average temperatures, more extremely high temperatures, fewer extremely low temperatures *Most of Australia (all 13 sites), less warming in some coastal areas (e.g. Gold Coast, Perth) and Tasmania (Hobart), greater warming north-west (Darwin)*	Passive solar design: • Control solar gain • Provide adequate ventilation • Provide adequate insulation • Add thermal mass	Passive solar design: • Decrease lighting and equipment loads • Upgrade air conditioning system (passive solar design may eliminate need for any mechanised cooling system) • Use reflective glazing and external shading • Increase insulation and add thermal mass • Use passive ventilation methods • Use automated building controls	Passive solar design: • Minimise use of air conditioning systems • Use passive ventilation methods
More summer rain in north and east, more autumn rain inland, less rain in spring and winter *Most of Australia, but southern areas have less rain in all seasons, and Hobart has increased winter rain*	• Collect and use rainwater • Reduce water demand • Reuse water on-site • Control stormwater	• Decrease potable water consumption (both internally and externally) • Install water submeters • Minimise use of potable-water-based cooling systems	• Install on-site water storage • Build more indoor sports facilities
More-intense cyclones, wind speeds and storms *Wind speeds, extreme rainfall events and intense local storms generally increasing over the whole continent, potentially most marked in the north-east (all 13 sites, possibly more so in Darwin, Cairns and Brisbane)*	• Upgrade fasteners in roof structures and in sub-floor • Improve weathertightness and drainage detailing	• Design for increased wind loadings	• Improve building moisture management methods
Flooding *Greater chance of flooding in areas where increased rainfall and storms events likely; potentially all sites affected with possibly more risk in Cairns, Brisbane, and the Gold Coast*	• Avoid flood-prone areas • Increase minimum floor levels • Use water-resistant construction materials • Install vulnerable services as high as possible	• Improve land-use and site management • Use water-resistant construction materials • Use higher placement for vital equipment and supplies	• Prevent sewerage, soil and mud contamination
Hail events *Decreased frequency of hail events in Melbourne; increased frequency of hail events in Sydney*	• Use impact-resistant roofing materials • Designing more appropriate window protection	• Protect externally fitted services and fixtures	• Keep roofs well maintained
Bushfires *Increases in bushfire frequency and intensity across all of Australia*	• Use fire-resistant building materials • Install domestic sprinkler systems in high risk zones	• N/A	• Increase use of other forms of natural shading where vegetation is removed due to fire risk

How will your organisation manage the risks and opportunities related to climate change?

The scope of organisational change required is much broader than looking at how to improve energy efficiency throughout your properties. Carbon output is made through the embodied energy in building materials, transport and the supply chain as well as direct emissions. For instance, the materials you recommend or approve in new buildings, tenancy fitouts or retrofits involve varying degrees of energy and transport in their manufacture, transport and installation. The Australian Sustainable Built Environment Council (ASBEC) estimates the building sector is responsible for 23% of Australia's total greenhouse gas (GHG) emissions. Your organisation's response to this will need to involve substantial re-thinking, innovation and adaptation, supported by change management and education programs.

The challenge is, how can your organisation thrive in a carbon-constrained economy? Climate change impacts may take many different forms, from increased energy and fuel costs through to the physical impacts of temperature extremes (will your building HVAC system cope?) and more frequent severe storm events.

Opportunities may also present themselves. ASBEC estimates that through energy efficiency measures alone the property sector can cut its GHG emissions in the order of 30–35%. All greenhouse gases other than carbon dioxide are measured as $CO_{2\text{-}e}$ (CO_2 equivalent) either in kilograms or tonnes. Helping tenancies reduce their carbon footprint may form a pivotal role in providing property services in the future. The issue of owner–tenant split incentives is addressed in Total Environment Centre Issues Paper No. 5 to the Garnaut Review (see www.tec.org.au).

Steps: Adapting to climate change

The following steps will help you determine:

- how to gather the information your organisation will need to manage climate change
- how to determine the top priority actions for adapting to climate change.

These steps are adapted from *The Greenhouse Gas Protocol*, Revised Version, World Business Council for Sustainable Development and World Resources Institute (see www.ghgprotocol.org).

Sustainability Advantage

Sustainability Advantage is a business support service from the Department of Environment and Climate Change NSW (DECC). It is designed to help businesses understand sustainability, successfully manage their operations to achieve better environmental outcomes and add business value.

Sustainability Advantage participants have the option to undertake a Climate Change module. With the support of DECC and their contractors, participants first develop their GHG inventory – a quantified list of GHG emissions and sources. Depending on their priorities, they may focus on areas that include:

- minimising GHG footprint
- climate change risk management
- realising business opportunities from climate change.

For more information please contact Business Partnerships on (02) 8837 6000 or sustainbus@environment.nsw.gov.au

1 Gain commitment and establish responsibilities

Senior management may be committed to making your organisation more sustainable and reducing its greenhouse footprint. However, you may need to gain commitment from other parts of your organisation. Some managers may be actively involved with implementing good environmental practices for reasons such as reducing compliance costs and improving operational efficiency, but may need support to gain a deeper awareness of the possible impacts of climate change on your business. Help your management team understand:

- what management issues your organisation needs to address in relation to climate change
- the benefits to be gained from implementing a climate change management strategy
- the risks of inaction.

2 Choose a greenhouse gas reduction program

Greenhouse Challenge Plus enables Australian companies to form working partnerships with the Australian Government and offers technical tools to help them improve their energy efficiency, thereby reducing their GHG emissions. For example, the *National Greenhouse Accounts (NGA) Factors* workbook (See www.climatechange.gov.au/workbook/index.html) is designed to help with calculating GHG emissions and estimating greenhouse sinks using appropriate methods and emission factors. Data can be entered and reports generated using the Online System for Comprehensive Activity Reporting (OSCAR) application. Staff tools are also available, offering ways to change workplace habits by educating and motivating staff (www.environment.gov.au/settlements/challenge/members/stafftools.html).

CitySwitch Green Office (previously the 3CBDs Greenhouse Initiative) is a national tenant energy management program run in partnership between the cities of Sydney, North Sydney, Parramatta, Willoughby, Adelaide, Brisbane, Melbourne and Perth, and the Department of Environment of Environment and Climate Change NSW and Sustainability Victoria. Signatories commit to achieving and maintaining an accredited 4 stars or higher NABERS Energy tenancy rating (www.cityswitch.net.au). NABERS Energy measures and rates a tenancy's actual yearly greenhouse gas emissions using 12 months of energy bills. You can use the NABERS rating to compare your office's environmental impact to your peers (see www.nabers.com.au).

Greenhouse gas accounting and reporting standard

Developed by the World Business Council for Sustainable Development, the *Greenhouse Gas Protocol Corporate Standard* is an internationally recognised accounting and reporting standard. It covers carbon dioxide (CO_2) and the five other greenhouse gases included in the Kyoto Protocol: methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6). These five are measured as CO_2 equivalents ($CO_{2\text{-}e}$) in kilograms or tonnes. The Standard was designed:

- to help organisations prepare a GHG inventory that represents a true and fair account of their emissions, through standardised approaches and principles
- to simplify and reduce the costs of compiling a GHG inventory
- to provide information that can be used to build strategies to manage and reduce GHG emissions, and
- to increase consistency and transparency in GHG accounting and reporting.

The Standard builds on experience and knowledge drawn from businesses, NGOs, governments and accounting associations. It has been road-tested by over 30 companies in nine countries. The vision behind the Standard is to harmonise GHG accounting and reporting standards internationally so that different trading schemes and other climate-related initiatives adopt consistent approaches to GHG accounting. The Standard recommends that 'a well designed inventory will help organisations to:

- manage GHG risks and identify reduction opportunities, and
- participate in mandatory programs and GHG markets.'

Further, GHG inventories can support public reporting and participation in voluntary GHG programs, and help to gain recognition for early voluntary action.

www.ghgprotocol.org

The Total Environment Centre is collaborating with the commercial property sector in offering the **Existing Buildings Project** aimed at combating climate change. A series of workshops has been designed to build understanding and commitment and the program aims to quantify emissions data, recognise improvements and acknowledge ratings in accordance with NABERS Energy (see www.tec.org.au/index.php?option=com_content&task=view&id=673&Itemid=334).

EPA Victoria has a comprehensive **Carbon Management Principles Resources** website which lists Australian and international best practice guides and tools (www.epa.vic.gov.au/climate-change/carbon-management/resources.asp).

For some companies it will be a sufficiently large first step to embark upon the type of change outlined here in Step 2, where workshops and software have been designed to guide you through the process. However, as the carbon reduction landscape becomes more sophisticated in response to the introduction of emissions trading, mandatory reporting and increasingly urgent environmental targets, Steps 3 to 6 reveal the level of detail required to compete in a marketplace of increasingly environmentally aware tenants and investors.

3 Prepare your greenhouse gas inventory

Compile baseline data for your GHG emissions inventory. Your organisation will need this information to determine risks and identify opportunities for reducing its GHG emissions.

Determining a GHG inventory baseline, and carbon footprint, is an accounting process and it involves identifying your emission sources and managing the quality of your data.

The following traditional accounting fairness principles should be the basis for any GHG reporting:

- relevance – select an inventory boundary that reflects the substance and economic reality of the business relationship and is not merely its legal form
- completeness – account for all relevant emissions
- consistency – so that ongoing reporting can be undertaken on a yearly basis
- transparency – so that internal and external reviewers can determine whether your reporting is credible
- accuracy – data should be sufficiently precise and organisations should actively work towards reducing uncertainties in the data.

Building in your reporting requirements

Make sure any reporting requirements from your GHG reduction program are built into your GHG inventory (see Step 3). Also check whether you have the correct information for mandatory reporting if required.

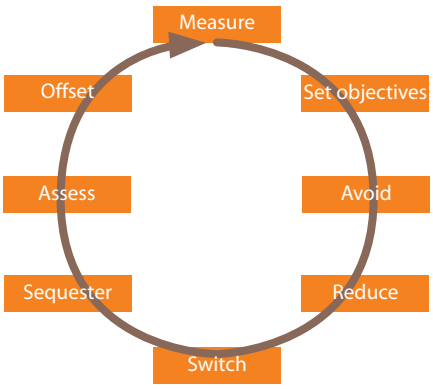
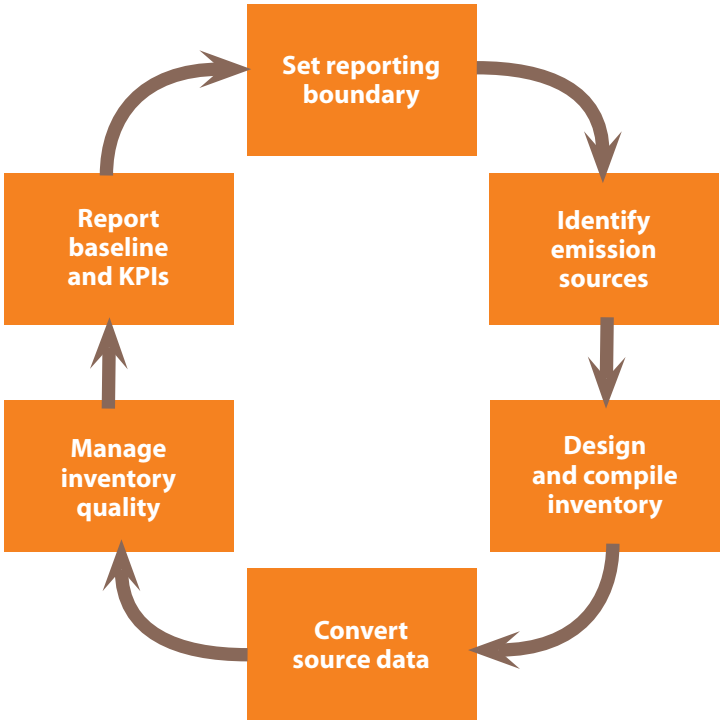


Diagram adapted from EPA Victoria Carbon Management Principles Resources

Determining your greenhouse gas baseline



3A Set the reporting boundary

Set the boundary for your organisation's GHG reporting by determining the extent of operations it owns or controls. There are two main approaches for this:

- the equity share approach – where you account for GHG emissions from operations according to your share of equity in the operation (e.g. listed property trust), or
- the control approach – where you account for 100% of the GHG from operations over which you have control.

The control approach can be further categorised into:

- financial control – ability to directly control financial and operating policies and you retain most of the benefits and carry the risk of the operation (e.g. building owner)
- operational control – if you have full authority to introduce and implement operational policies and procedures (e.g. managing agent overseeing daily operations).

3B Identify your emission sources

To help delineate emissions from different organisations and to avoid double counting, three scopes are carefully defined for GHG reporting purposes:

Setting your boundary

Setting your boundary really depends on your company structure and it is important to remember the principles of relevance, completeness, consistency and transparency. If you are unsure, allow for flexibility when setting up your inventory so you can review your reporting options to make a final determination.

Difficult questions about your reporting boundary

- How do I deal with complex company structures and shared ownership?
- How do I account for and report outsourced and leased operations?

For more information on difficult boundary questions such as these, see *The Greenhouse Gas Protocol*, Revised Version, World Business Council for Sustainable Development and World Resources Institute, www.ghgprotocol.org or www.wbcsd.org

Property sector emission sources

- **Scope 1** – Direct GHG emissions, for example natural gas (HVAC), refrigerant leaks (HVAC), petrol and diesel (vehicles)
- **Scope 2** – Indirect GHG emissions from purchased electricity consumed by the organisation e.g. electricity used for lighting, HVAC, lifts, escalators and other sources
- **Scope 3** – Other indirect GHG emissions, for example, methane (emissions from waste sent to landfill), petrol and diesel (contracted cars, taxis).

Examples of property sector emission sources

Scope	Definition	Examples
Scope 1: Direct GHG emissions	Fuel you burn	petrol, natural gas, LPG
Scope 2: Indirect GHG emissions from purchased electricity	Fuel others burn for you	electricity, process emissions
Scope 3: Other indirect GHG emissions	Emissions from services you use and products you produce	waste disposal, raw materials, air travel, contractors' emissions

3C Design and compile your inventory

Design your inventory so you can aggregate or disaggregate your data for various organisational and operational boundaries. Aim to minimise the reporting burden, reduce the risk of errors that might occur while compiling data, and take advantage of any relevant data already collected and reported. You may already be gathering some of this data for other reporting requirements, e.g. the GHG reduction programs discussed here in Step 2 and in Section 3.5 'Managing energy'.

Identify data sources and gather data from your multiple facilities or business functions. The following table outlines example data sources for typical property sector GHG emission sources.

Typical data sources for property sector GHG emissions

Emission source	High level data		More detailed data	
	Data source	*Likely responsible party*	*Data source*	*Likely responsible party*
Scope 1 emissions – Direct emissions				
Gas	Bills	Accounts	Energy meters	Property managers
Vehicle mileage (vehicles owned by organisation)	Expense claims	Accounts	Fleet management performance indicators	Fleet managers
Refrigerants	Refrigerant capacity	Property managers	–	–
Scope 2 emissions – Indirect emissions (purchased electricity for own use)				
Electricity	Bills	Accounts	Energy meters	Property managers
Scope 3 emissions – Indirect emissions (for advanced GHG inventories)				
Waste	Estimates of waste quantities	Property managers	Measurement of waste quantities and consistencies	Property managers
Flights	Travel agent Expense claims	Travel Agent Accounts	–	–
Vehicle mileage (vehicles contracted by organisation)	Expense claims	Accounts	Fleet management performance indicators	Fleet managers
Taxi mileage	Expense claims	Accounts	–	–
Embodied energy of equipment and supplies	Estimation	GHG protocol tool or subject expert	Specific life cycle assessment details	Suppliers

3D Convert source data into tonnes of GHG emitted

Convert your source data (e.g. kWh of electricity, tonnes of waste, liquid fuels) into GHG emissions from source. This involves multiplying your source data by an emission factor to get kilograms or tonnes of $CO_{2\text{-}e}$.

Emission factors can be sourced from *National Greenhouse Accounts (NGA) Factors* published by the Australian Government Department of Climate Change (see www.greenhouse.gov.au/workbook/index.html). Other specific sources or emissions not covered in *NGA Factors* may require detailed life cycle assessment to identify the GHG impacts.

You will need to update the emission factors on a yearly basis because GHG emitted changes every year – particularly the mix of electricity generation sources (e.g. % of renewable or type of coal used). Refer to *NGA Factors* for the latest emission factors.

The Greenhouse Challenge Plus program provides a range of tools including an emissions calculator (an excel spreadsheet) to help you complete your GHG emissions inventory. Check whether the latest emissions are included. See www.environment.gov.au/settlements/challenge/members/emissions.html

3E Manage your inventory quality

Managing your inventory is critical to make sure your GHG reporting is robust and will stand up to external scrutiny. You may wish to set up an Inventory Quality Team, including formally assigning accountabilities to ensure that quality data is collected.

- Check against your original boundary to ensure you have set the correct boundary for your GHG reporting.
- Make sure you have you included all material indirect emissions.
- Identify data gaps and make a commitment to eliminating them to improve the robustness of your reporting.

3F Report your baseline and KPIs

Choose a base year – the earliest relevant point in time for which you have reliable data. Keep in mind a number of changes can trigger the need for recalculating a base year including significant acquisitions, divestments, structural changes, changes in methodology or improvements in data accuracy.

Which indirect emissions should I report?

Determining which Scope 3 indirect emissions to report can be an iterative process. You need to identify the range of indirect emissions then decide which ones contribute to your carbon footprint. For example, do you account for the GHG emissions from your tenants? You may wish to improve the robustness of your reporting over time as it may not be possible to access all the data in your first attempt. If this is the case, keep your stakeholders informed of your commitment to improve your reporting.

4 Identify climate change risks and opportunities

Climate change and the follow-on changes to the business environment present both future risks and opportunities.

- Identify the risks related to climate change impacts and GHG emissions regulation.
- Give priority to risks that require further attention, and
- Put in place the structures and procedures to ensure these higher priority risks are effectively managed.

Worksheet 2.4A provides some brainstorming prompts for identifying risks. For more information on identifying risk, see *Climate Change Impacts & Risk Management, A Guide for Business and Government*, Australian Greenhouse Office 2006.

Identify the opportunities with the highest potential for your organisation. For each opportunity, consider the:

- potential for businesss growth
- strategic fit with your organisation's mission.

Use Worksheet 2.4B to help get you started on identifying these opportunities.

5 Set performance targets

Once you have developed a robust GHG inventory the next vital step is to set firm improvement targets with milestones for action. Greenhouse gas reduction targets should relate to your organisation's sustainability goals and should be practical and achievable at a stretch. You may wish to articulate your GHG commitments and targets in your organisation's sustainability policy (See Section 2.3: 'Developing a sustainability policy for your organisation'.)

Set specific targets for GHG intensive areas and link your GHG targets to your organisation's energy targets (see Section 3.5: 'Managing energy').

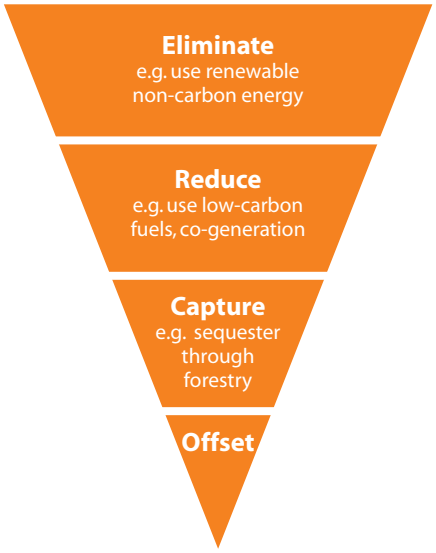
When setting targets ask the following questions:

- How do your targets compare with your peers in the market?
- Have you informed your stakeholders of the targets? Do the targets meet the stakeholders' current and future expectations?
- Can you verify progress in relation to the targets?

Allocate responsibility for achieving the targets. Where applicable, integrate the targets and minimum standards into service or performance contracts with relevant service providers and staff performance agreements (see Step 7).

GHG management hierarchy

The GHG management hierarchy ranks management options for reducing your organisation's GHG footprint from the most to the least effective. The most effective GHG management plans strive to maximise GHG elimination and reduction, followed by capturing GHG and, finally, considering the use of offsets (e.g. carbon credits).



Make sure your targets are not numbers hidden in a report. Make them part of 'business as usual' operations. Promote targets to key stakeholders and ensure they understand the process you have committed to and the intended benefits.

6 Develop your climate change action plan

Develop an action plan for reducing and managing your organisation's contribution and exposure to climate change. The plan should identify responsibilities and timeframes for action. A vital first action might be improving the robustness of your GHG inventory. Prioritise your actions to minimise risks and maximise opportunities.

Assessing options for reducing your GHG footprint

Management option	How to assess the scope and applicability for your organisation	Additional benefits
Eliminate	Business case for purchasing or generating renewable energy, such as GreenPower, photovoltaics, roof-top wind turbines	Purchasing GreenPower can increase a building's NABERS Energy star rating
Reduce	Technical reports including energy audits, energy efficiency opportunity assessments Business case for costs and benefits of implementing energy efficiency Management plans for implementing energy efficiency opportunities Technical reports assessing options for fuel switching to low-carbon energy sources such as biofuels and gas co-generation for building heating and cooling Business case assessing fuel switching options	May also be useful for your energy action plan, identifying energy efficiency opportunities generally or participating in programs such as CitySwitch Green Office (previously the 3CBDs Greenhouse Initiative) or Greenhouse Challenge Plus
Capture	No obvious significant opportunities for the property sector	N/A
Offset	Report on available carbon offsets including the costs, quality, market perception and risks Business case for costs and benefits of using offsets	Can be reported in Greenhouse Challenge Plus reports

7 Engage tenants, contractors and the supply chain

Your tenants may have already starting asking for your help in understanding their carbon footprint – i.e. the impact of their activities on the environment, particularly with regard to climate change and the amount of greenhouse gases produced. A number of online calculators are available to estimate individual ecological (carbon or GHG) footprints and measurements are made in units of carbon dioxide

or CO_2 equivalents ($CO_{2\text{-}e}$). This is a good first step towards behavioural change.

EPA Victoria's website has an easily accessible greenhouse calculator to establish the ecological or carbon footprint for homes (see www.epa.vic.gov.au/GreenhouseCalculator/calculator/default.asp).

Introducing your tenants and supply chain to a GHG reduction program such as Greenhouse Challenge Plus is an effective way for them to assess and manage their carbon emissions. (See Step 2.) Regularly engage with your tenants to support them in reducing their GHG emissions and keep them up-to-date on the performance improvements you are working on.

Encourage your office tenants to join CitySwitch Green Office (previously the 3CBDs Greenhouse Initiative); see www.cityswitch.net.au and Step 2.

Work with your contractors and suppliers to look for low-carbon-intensive products and services. This may require long-term strategic partnerships so that both parties can share the benefits. However, tenants and building owners should scope their environmental and emission reduction requirements carefully during the tender process to avoid considering contractors and suppliers who are unable to meet pricing criteria. Look for opportunities to reduce transport impacts by optimising logistics and distribution operations.

8 Collect data and monitor performance

Build GHG emission management into regular base building reporting. Ensure monthly reporting tracks performance against your targets, and investigate variations or unusual events. You could use Worksheet 3.4C: 'Monthly property sustainability report' or adapt this and integrate it into your existing monthly reports.

At team meetings discuss monthly performance and the measures taken to maintain or adjust building services so they make the best contribution to meeting your GHG reduction targets.

9 Review performance annually

Knowledge about climate change is developing rapidly, therefore an effective climate change management system is a dynamic system which is constantly being reviewed and revised. The system needs to be able to identify future trends and adapt to meet these requirements.

Encourage your tenants to:

- reduce their GHG emissions through energy saving measures such as turning computers and lights off, using energy efficient equipment and retrofitting their lighting; see Section 3.5: 'Managing energy' for more information.
- use public transport and consider active transport options like walking or cycling to work to reduce their emissions; help tenants by providing secure bike storage and showers
- optimise goods delivery (e.g. stationery in offices or clothing deliveries in retail centres) and other services they procure to reduce transport impacts. Also ask suppliers to minimise or take back and reuse packaging. Source packaging that uses recycled materials. (For more about the Supply Chain, see Section 5: 'Sustainability and the Supply Chain'.)
- reduce paper use, minimise waste generation and maximise recycling (see Section 3.7: 'Managing waste and recycling')
- reduce air travel by using teleconferencing or encouraging rail travel instead,
- purchase energy from renewable sources such as accredited GreenPower; investigate purchasing GreenPower on behalf of your tenants.

An annual management review and subsequent updating of your climate change management system is essential. In addition, you may also need to conduct management reviews whenever a decision is made to change operations or procedures that will affect the climate change impact of an activity or facility.

Your annual review might include looking at:

- climate change management policy (or reference to this in your sustainability and risk management policies)
- climate change management issues and performance, and the progress of climate change management programs
- developments, achievements and new challenges within individual departments
- key stakeholders changing expectations, including your tenants and investors
- tenants performance in adapting to climate change
- contractors' and suppliers' performance
- internal or external audit results
- changes in your business activities, services provided or product offerings
- advances in science and technology
- changes in legislation, regulations, codes of practice, etc.

Further information

- Department of Environment and Climate Change NSW, Sustainability Advantage program, www.environment.nsw.gov.au/sustainbus/sustainabilityadvantage.htm
- Carbon Pollution Reduction Scheme , www.climatechange.gov.au/emissionstrading/index.html
- Australian Built Environment Council (ASBEC), www.asbec.asn.au
- CitySwitch Green Office, www.cityswitch.net.au
- *Adaptation Options from the Australian Greenhouse Office's Assessment of the Need to Adapt Buildings for the Unavoidable Consequences of Climate Change*, Australian Government Department of Climate Change, August 2007
- *National Greenhouse Accounts (NGA) Factors*, Australian Government Department of Climate Change, www.greenhouse.gov.au/workbook/index.html
- National Greenhouse Accounts (NGA) Factors emissions calculator, www.environment.gov.au/settlements/challenge/members/emissions.html
- Australian Government Department of Resources, Energy and Tourism, *Energy Efficiency Opportunities Act 2006* (amended March 2007), www.energyefficiencyopportunities.gov.au
- EPA Victoria Carbon Management Principles, www.epa.vic.gov.au/climate-change/carbon-management/resources.asp
- Garnaut Climate Change Review, www.garnautreview.org.au
- Greenhouse Challenge Plus, Australian Government Department of the Environment, Water, Heritage and the Arts, www.environment.gov.au/settlements/challenge
- Greenhouse Gas Protocol, Revised Version, World Business Council for Sustainable Development and World Resources Institute, www.ghgprotocol.org or link from www.epa.vic.gov.au/climate-change/carbon-management/resources.asp if direct access not permitted; see also www.wbcsd.org
- *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M L Parry, O F Canziani, J P Palutikof, PJ van der Linden and C E Hanson (Eds), Cambridge University Press, Cambridge, UK, www.ipcc.ch
- National Greenhouse Gas Inventories Programme IPPC (Intergovernmental Panel on Climate Change), www.ipcc-nggip.iges.or.jp/
- Total Environment Centre Existing Buildings Project, www.tec.org.au/index.php?option=com_content&task=view&id=673&Itemid=334
- NABERS Energy, www.nabers.com.au
- NABERS rating calculator (commercial), www.nabers.com.au

Worksheets

Review and use these Word documents:

2.4A Risks relating to climate change

2.4B Opportunities arising from climate change

Worksheet 2.4A

Risks relating to climate change

This is an example only – adapt this worksheet to suit your organisation's requirements.

Brainstorming prompts for identifying risks to the property sector

Type of risk	*Examples of risk treatment*
Spread risk	
Physical	Consider weather exposure in building portfolio selection. Increased insurance coverage.
Structural and technological	
Physical	Prepare buildings for changing weather patterns and extreme events. Consider increased energy demand and future trends in building upgrades.
Competitive	Consider using preparedness for changing weather patterns, extreme events and increased energy demand as a selling point to existing and potential customers.
Avoidance	
Regulatory	Minimise exposure to the financial impact of new greenhouse gas regulations by reducing your organisation's greenhouse gas emission footprint.
Litigation	Develop a robust Environmental Management System to ensure compliance with all relevant regulations.
Competitive	Develop new opportunities from changes in risk.
Reputation	Consider developing a vision to move towards best practice in climate change management.
Research	
Physical	Be aware of new technology developments.
Regulatory	Be aware of new regulatory trends and drivers.
Litigation	Be aware of new precedents for litigation.
Competitive	Be aware of new products and services being offered in the market place.
Reputation	Be aware of consumer backlash against the organisation or any products and services.
Performance	Review how other funds' assets are performing, pay attention to those with ESD initiatives against those without.
Future	Form a view on how property may look in 2 years, 5 years, 10 years.
Education, behavioural	
Physical	Educate and inform management and staff about climate change risks and adaptation measures.
Regulatory	Educate and inform management and staff about regulatory compliance.
Litigation	Educate and inform management and staff about litigation risks.
Competitive	Engage management and staff to suggest and develop opportunities for new products and services.
Reputation	Consider a partnership with a non-government organisation to validate your organisation's climate change management efforts in the eyes of consumers.

Adapted from the *Carbon Disclosure Project Report 2006* Australia and New Zealand, www.cdproject.net/download.asp?file=CDP4_Australia_Report.pdf

Ranking of risks

Rank the risks according to both their probability and severity:

	Low probability	**High probability**
High severity	**High risks** (List risks here)	**Extreme risks** (List risks here)
Low severity	**Low risks** (List risks here)	**Medium risks** (List risks here)

Further reading

- *Managing Investments in a Changing Climate*, IIGCC 2006 (Institutional Investors Group on Climate Change), www.iigcc.org/docs/PDF/ManagingInvestmentsChangingClimateIIGCCconferencereport.pdf
- *The Business Case for Early Action*, April 2006, Australian Business Roundtable on Climate Change, www.businessroundtable.com.au/pdf/F078-RT-WS.pdf
- *Climate change: beyond whether*, UBS Research Focus, January 2007, www.ubs.com/1/e/media_overview/media_emea/search1/search10?newsId=113220
- *A climate for change – A trustee's guide to understanding and addressing climate risk*, Carbon Trust and the Institutional Investor Group on Climate Change, www.carbontrust.co.uk/publications/publicationdetail.htm?productid=CTC509

Worksheet 2.4B

Opportunities arising from climate change

This is an example only – adapt this worksheet to suit your organisation's requirements.

Brainstorming session triggers and prompts

Opportunities	Examples	Size of opportunity for your organisation (low, medium, high)	Suitability to your organisation (low, medium, high)
New products			
Markets for more efficient version of products	• Buildings ranking at high levels of environmental ratings e.g. NABERS Energy, Water, Waste and IE; Green Star • Some government agencies and large corporations already requiring minimum NABERS Energy, Water and Waste ratings.		
Markets for more efficient version of services	• Property management with superior capabilities in managing high efficiency buildings to their optimum performance.		
Markets for products using alternative energy sources	• Buildings incorporating renewable energy such as solar panels, photovoltaic glazing on windows, wind power, co-generation systems, etc. • Facilitating GreenPower purchase for tenants		
Development and marketing of emission reduction technologies or processes Development of products and services that help mitigate climate change-related risks	• Upgrading buildings to high energy efficiency standards • Upgrading buildings to minimise tenants' and building's waste • Facilitating tenants' energy efficiency initiatives and greenhouse gas emission reductions • Capacity building with landlords, tenants, contractors and supply chain.		
Trading opportunities			
Involvement in emission trading schemes	• Creating carbon credits from energy efficiency activities • Join a greenhouse gas reduction program		
Government support			
Access government funds	• Climate Change Fund (NSW)		
Marketing and branding opportunities			
Marketing and branding opportunities associated with a position on climate change and the performance of products and services	• Ranking on Dow Jones Sustainability Index • Australia's SAM sustainability index • Sustainability awards • Environmental reporting		

Opportunities	Examples	Size of opportunity for your organisation (low, medium, high)	Suitability to your organisation (low, medium, high)
Improve community relations and public opinion			
Improved community relations and public opinion Engagement with policy development to avoid hostile regulatory environments	• Improve relationships with non-government organisations and communities • Contribute experience to policy development		

our environment it's a living thing

Department of Environment and Climate Change NSW

3

Sustainability and Property Management

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3.0

Section 3 overview

This section of the Sustainable Property Guide deals with acquisition and operational management of commercial property. By adopting a sustainable approach, property managers can:

- reduce outgoings through more efficient use of resources
- ensure the implications of achieving sustainable performance are taken into account during the acquisition process
- establish systems to manage the sustainability of upgraded or purchased buildings so their ratings and performance can be maintained
- improve the quality of the indoor environment
- enhance the property's and owner's reputation, helping to attract and retain tenants.

Section 3 also offers advice on establishing priorities and systematically addressing operational sustainability.

3.1 Incorporating sustainability into decision making

Discusses the links between sustainability and business value and provides simple tools for developing the business case.

Worksheet 3.1A Sustainability business case template

Worksheet 3.1B Sustainability project evaluation

Worksheet 3.1C Sustainability project payback – worked example

3.2 Sustainability and property acquisitions

Explains how to assess sustainability at the acquisition phase, and how this can add value to the acquisition process by supplementing the condition assessment and providing information for the future management of the asset.

Worksheet 3.2A Sustainability evaluation – property acquisition phase

3.3 Tenant engagement and green leases

Provides advice on how to engage tenants and inform them about sustainability, and how to include environmental performance clauses in lease documentation.

Worksheet 3.3A Building rules and regulations – sustainability clauses

Worksheet 3.3B Green lease checklist

3.4 Assessing sustainability performance

Explains the current tools and rating systems for assessing building performance.

Provides guidance on measuring baseline performance, benchmarking and setting targets for sustainability performance.

Provides tools for performance auditing and advice on preparing a Sustainability Action Plan.

Worksheet 3.4A Property sustainability data template

Worksheet 3.4B Portfolio sustainability data template

Worksheet 3.4C Monthly property sustainability report (Excel)

Worksheet 3.4D Annual resource efficiency review

3.5 Managing energy

Provides guidance on measuring baseline performance, benchmarking and setting targets for energy performance.

Includes a planning tool for performance auditing, a checklist of building services, model specifications and issues to consider when briefing service providers.

Provides guidance on preparing an Energy Action Plan and engaging tenants in energy efficiency.

Worksheet 3.5A	Energy action plan
Worksheet 3.5B	Energy checklist – base building

3.6 Managing water

Provides guidance on measuring baseline performance, benchmarking and setting targets for water efficiency.

Includes a planning tool for data collection and performance auditing.

Provides guidance on preparing a Water Action Plan, briefing contractors who use water, and engaging tenants in water efficiency.

Worksheet 3.6A	Water action plan
Worksheet 3.6B	Water saving checklist
Worksheet 3.6C	Planning a water audit – scope of work checklist

3.7 Managing waste and recycling

Provides guidance on measuring baseline performance, benchmarking and setting targets for waste and recycling performance.

Provides guidance on preparing a Waste and Recycling Action Plan, briefing waste and recycling contractors, setting up contracts for these services and engaging tenants in waste reduction and recycling.

Worksheet 3.7A	Property waste and recycling review
Worksheet 3.7B	Waste and recycling action plan
Worksheet 3.7C	Waste collection contract checklist
Worksheet 3.7D	Clauses for cleaning, waste and recycling contracts

3.8 Managing indoor environment quality

Provides guidance on measuring baseline performance, benchmarking and setting targets for indoor environment quality (IEQ).

Provides guidance for developing an Indoor Environment Quality Action Plan, including management practices and tracking performance, assessing systems that ensure optimal IEQ and engaging tenants in improving IEQ.

Provides a fitout/refurbishment strategy that includes appropriate design attributes, product choices and post-occupancy monitoring for improved IEQ.

Worksheet 3.8A	Indoor environment review
Worksheet 3.8B	Indoor pollutant sources and tips on mitigation
Worksheet 3.8C	Indoor air quality considerations during fitouts
Worksheet 3.8D	Tenant survey: indoor environment quality

3.9 Responsible refrigerant use

Provides guidance on assessing refrigerants and equipment, and the systems used to benchmark their performance.

Provides guidance on developing a Refrigerant Management Plan, including collection and destruction of unwanted refrigerants and using alternative and natural refrigerants.

Worksheet 3.9A	Refrigerant and equipment review
Worksheet 3.9B	Refrigerant gases register

Incorporating sustainability into decision making

3.1

Context

This section discusses how to build sustainability into the decision-making process for a building or portfolio you are managing.

Your organisation will have its own approach to assessing potential building-related projects, based on estimating their value to the organisation, aligning them with business goals and taking into account the market, the risks due to inaction and the potential to maximise any opportunities that may arise. (See Section 2.3: 'Developing a sustainability policy and strategic goals for your organisation'.)

It's vital that sustainability – environmental, social and economic – is incorporated into this assessment process so that both direct and indirect benefits (e.g. improved reputation or marketability resulting from good environmental performance) can be part of the value matrix.

This does not apply to 'sustainability' initiatives only. Incorporating sustainability criteria into all decision-making processes is a critical component of becoming a sustainable property organisation because many seemingly unrelated business decisions can impact on your overall sustainability standing.

Steps: Integrating sustainability into the business case

The following steps relate to either a building or portfolio-wide project or initiative. These steps are a suggested guide only and should be modified to suit your organisation and the particular set of circumstances. (These steps are adapted from 'The Sigma Business Case Tool', Sigma Guidelines, www.projectsigma.co.uk/toolkit/BusinessCase.asp).

1 Identify overall impacts

Identify the significant environmental impacts of the building or portfolio, and the opportunities and risks they present, so proposed initiatives can be considered within this context.

What's in this section

Determine whether a proposed initiative will increase or decrease the building's or portfolio's overall environmental impact. For example:

- Will installing more efficient lighting or new equipment reduce overall greenhouse gas emissions?
- Could expanding the refrigeration capacity in a retail development increase the property's overall energy intensity?
- Does the project have hidden environmental impacts? For example, the impact of redundant fittings from a major lighting upgrade not being recycled.

2 Identify perceptions and expectations

Will the proposed outcome meet your stakeholders' expectations – including investors and tenants? For example, upgrading a base building to meet a 3 star NABERS Energy rating may not meet your tenant's expectations of a 5 star building. However, it should be noted that a 5 star NABERS Energy rating would be difficult to obtain in most established buildings. How you manage your tenant's expectations will influence your ability to maximise opportunities, minimise risks and promote the outcomes.

3 Make it relevant

Does the initiative clearly align with your corporate commitment and broader business goals? Link the opportunities and risks associated with the proposed initiative with your organisation's strategic objectives to map the interactions and impacts. Wherever possible, follow the language and structure of existing corporate plans so your proposal is easily understood by your intended audience.

4 Expand your evaluation criteria

Expand the criteria you use to assess the viability of potential projects and initiatives to include the indirect considerations highlighted in Worksheet 3.1B. Workshop major projects or strategies so that cross-functional perspectives – such as those from an engineering, marketing or property management background – all contribute to decision making and priority setting. As part of the evaluation:

- Focus on initiatives that address the highest risks or most attractive opportunities.
- Identify the best delivery mechanisms e.g. include in next capital works upgrade or upon acquisition of a property.
- Make sure any operational savings are included as part of any return-on-investment or payback calculations.

Lighting control upgrade pays for itself in less than 18 months

'Colliers International initiated a pilot study at 52 Alfred Street, North Sydney, looking at the installation of controllers to the building lighting system.

This inexpensive system works on the basis that fluorescent tubes only require full voltage to turn on, after which they can operate with up to 30% less power without compromising lighting levels. No modification to existing light fittings was required, and no additional maintenance or repair costs were incurred as a result of the installation.

Benefits

In 12 months the trial achieved:

- total savings of $3,316
- total reduction of 118,202 kWh, and
- total reduction in greenhouse gas emissions of 111,113 kg/$CO_{2\text{-}e}$

with a 16-month investment payback.'

Colonial First State Global Asset Management

- Include indirect values e.g. reputation and market attraction.
- Consider whether project savings can be directed to other sustainability projects.

5 Back it up

Back up your proposal with examples, data and supporting information for each opportunity or risk, both from outside and within your organisation. Include financial costs and benefits wherever they can be identified. Worksheet 3.1C provides a worked example calculating the payback for a sustainability project (a lighting upgrade).

Consider indirect and contingent costs. The table below lists five tiers of environmental cost accounting, some of which may be relevant to various stages of the property management cycle and hence included in the business case.

Questions to consider throughout the process

- What are our competitors doing, e.g. have they committed to a 4.5-star NABERS Energy portfolio average?
- What do our stakeholders expect – does it meet market demand?
- How can extra value be added e.g. can the project be used as an example to help tenants or other building managers improve their performance?
- What risks could arise from the 'do nothing' option?

Tiers of environmental cost accounting

Tier	Description
Conventional costs – direct	Include costs of direct raw materials, utilities, labour, supplies, capital equipment and related depreciation.
Potentially hidden costs	Include upfront environmental costs incurred when procuring or building the property (e.g. cost of design, approval and construction), regulatory (e.g. waste management, pollution control, licensing) and voluntary costs during operation (e.g. building monitoring and reporting costs, environmental reporting costs) and back-end environmental costs (e.g. future costs of decommissioning, cleaning and rehabilitation etc.).
Contingent costs	Costs that may or may not be incurred at some point in the future, and may include: cost of remedying or compensating for future environmental incidents (such as Legionnaires outbreak), fines and penalties for future regulatory infractions, cost of meeting new environmental regulations (e.g. cost of carbon).
Relationship and image costs	These costs are difficult to determine and would seldom be identified separately within an accounting system. However, they could be expected to have influence on the value of intangible assets such as goodwill, branding and so forth. Examples are the ability to attract ethical or responsible investors or the cost of retaining a property listed on a sustainable property trust.
Societal costs (externalities)	These costs are often referred to as externalities and represent costs that an organisation imposes upon others as a result of its operations, but which are generally ignored by the organisation. Could include environmental damage caused by the organisation for which it is not held accountable or adverse health effects caused by organisation-generated emissions for which the organisation is not held responsible.

Source: Western Australia Industry Group, 2005 and adapted from 'An Introduction to Environmental Accounting as a Business Management Tool: Key Concepts and Terms' United States Environmental Protection Authority, Washington DC.

If the project does not meet your internal hurdle rates or payback period investigate external options such as state and Commonwealth Government funding support (see NSW Green Business Program).

6 Keep it dynamic

Make sure your business case is dynamic – keep it up to date and develop it further as priorities change. For example, energy projects that might not have met hurdle rates three years ago may now be viable with significantly increased energy contract prices. Your business case also needs to reflect increases in tenant and staff awareness and knowledge. Communicate and raise awareness of the benefits of environmental improvements including cost savings. Review the outcomes and provide feedback for the next business case.

Further information

- *Valuing Green: How green buildings affect property values and getting the valuation method right,* Green Building Council of Australia, Australia 2008, www.gbca.org.au
- *Green Value, Green Buildings, Growing Assets*, Royal Institution of Chartered Surveyors, United Kingdom 2005, www.rics.org/greenvalue
- *Building Refurbishment – Repositioning your Asset for Success*, Jones Lang Lasalle, March 2005
- *The Dollars and Sense of Green Buildings*, Green Building Council of Australia 2006, www.gbca.org.au
- 'The Costs and Financial Benefits of Green Buildings. A report to California's Sustainable Building Taskforce', Greg Kats, October 2003
- 'Examining the Cost of Green' Davis Langdon, October 2004 www.davislangdon.com
- 'Managing for Sustainable Development: Using Environmental Management Accounting and Sustainable Development Reporting', www.c4cs.curtin.edu.au/resources/publications/2003/managing-for-sustainable-development.pdf
- 'An Introduction to Environmental Accounting as a Business Management Tool: Key Concepts and Terms' United States Environmental Protection Agency, Washington DC
- 'The Sigma Business Case Tool': Sigma Guidelines, www.projectsigma.co.uk/toolkit/BusinessCase.asp
- NSW Green Business Program, www.environment.nsw.gov.au/grants/ccfgbp.htm
- 'Managing Investments in a Changing Climate', Institutional Investors Group on Climate Change (IIGCC), 2006

NSW Green Business Program

The NSW Green Business Program provides $22.5 million over five years for projects that will save water and energy in business operations in NSW. Funding is available across two streams for:

- market transformation – for water and/or energy saving projects which stimulate lasting structural and behavioural changes in the marketplace
- direct measures – for projects which deliver immediate water savings at a site or group of sites.

Activities which are eligible for funding under the Green Business Program include, but are not limited to:

- education and technology trial activities which increase the adoption of efficient technologies and practices
- projects which improve the efficiency of buildings, appliances and industrial processes
- projects which reduce peak electricity demand
- projects which reduce demand for electricity or water from electricity or water supply networks – e.g. co-generation, fuel switching, water recycling or stormwater harvesting.

For more information visit the Grants and Funding website at www.environment.nsw.gov.au

- 'A climate for change (A trustee's guide to understanding and addressing climate risk)' IGCC Investor Group on Climate Change Australia/New Zealand, www.igcc.org.au
- Royal Institution of Chartered Surveyors (RICS):
  - 'Transforming Existing Buildings: The Green Challenge', Final Report, March 2007
  - 'Financing and valuing sustainable property: we need to talk', April 2007
  - 'Carbon management of real estate', Guidance note, April 2008
  - 'The City Climate Challenge for 2050', 2007
  - 'Surveying sustainability: a short guide for the property professional', 2007

Worksheets

Review and use these Word documents:

3.1A Sustainability business case template

3.1B Sustainability project evaluation

3.1C Sustainability project payback – worked example

The business case at Investa

Energy

'The most compelling justification for our steadfast pursuit of energy savings, after meeting growing tenant demand, is capital efficiency. Approximately half of our energy efficiency improvements over the past three years have come about through tight management controls (i.e. matching supply of building services to demand) that did not require capital investment, and the other half arose out of capital expenditure on meters and efficiency projects with a forecast payback period of less than three years.

Overall, we estimate the combined return on investment in energy saving initiatives to be 60.1%. This figure is based on a targeted investment of $2.160 million to date that is delivering ongoing savings of 19 kWh/m^2 (electricity) and 53 MJ/m^2 (gas) over 650,000 m^2 which translates to $1.298 million in savings per annum.

In some of our buildings these savings pass directly to tenants due to their lease structures. It is our strong view that even where this is the case, a high yielding reduction in the cost burden associated with energy wastage ultimately rewards the landlord and tenants alike.

Water

Overall, we estimate the combined return on investments in water saving initiatives to be 75.9%. This figure is based on a capital investment of approximately $639,000 to date on metering and conservation initiatives that are delivering measured savings of 745 kL/m^2 over 500,000 m^2: a saving of almost $485,000 per annum when sewer discharge factors are included.'

Investa Property Group
Sustainability Report 2006

Worksheet 3.1A

Sustainability business case template

This is an example only – adapt this worksheet to suit your organisation's requirements.

Opportunity name	A simple statement describing the opportunity e.g. 'Greenhouse gas reduction plan', 'Recycling system for tenants', or 'Waterless urinals installation', etc.
Brief description	Describe the scope of the opportunity, what the current situation is and what business outcomes are likely (direct and indirect).
Relevant value drivers	List the business drivers that influence the opportunity, e.g. benefits such as reduced waste disposal costs, reduced workplace emissions, increased operational efficiency, reduced transport costs, improved reputation, improved marketability, etc.
Success indicators	How will success be measured? (e.g. operational cost savings, resource efficiency, market perception of leadership, ability to attract ethical investors, etc.)
Alignment with our goals and policies	How does the initiative demonstrate alignment with organisation values, business goals, sustainability policies or strategies and other policies or strategies? Is the project a risk to these?
Research and analysis	What additional research or analysis will have to be done to ensure benefits can be realised? (market research, life-cycle analysis, building services study, etc.)

Suggested participants	Which service groups within the organisation will need to be involved? (procurement, legal, operations, environment, etc.)
Other stakeholders	Will we need to engage with any organisations outside the company? (managing agents, tenants, contractors, suppliers, local government, etc.)
Potential actions	What specific actions will need to be done to further scope, evaluate or act on the opportunity?
Preliminary timeline	What are the time milestones?
Cost-benefit analysis	What is the cost of implementation? What are the financial benefits? What unquantifiable benefits are likely? What is the return on investment? What is the whole-of-life cost?

Source: Adapted from 'The Sigma Business Case Tool', Sigma Guidelines www.projectsigma.co.uk

Worksheet 3.1B

Sustainability project evaluation

Use the following as a guide to evaluate the various sustainability project options. This is an example only – adapt this worksheet to suit your organisation's requirements.

	Name of opportunity or project:
Feasibility	Are there significant obstacles or risks that could threaten the success of the initiative or opportunity?(list them)
	How straightforward would executing the project be, in terms of internal and external collaboration requirements?
	Can the project be delivered as part of a planned building upgrade?
	What are the resources needs, both financial and human? Do we have the capacity to support the project?
Attractiveness	Is the project well-aligned with the current strategic priorities of the organisation?
	Will this project be enthusiastically received by our customers and suppliers and other key external stakeholders? Does awareness training need to be conducted among internal stakeholders to support the project?

	Name of opportunity or project:
	What are the market expectations? e.g. minimum 4.5 star NABERS Energy rating
	Are we likely to realise a significant improvement in the proposed indicators of value? Consider financial and reputation value.
	Detail the environmental and social outcomes of the project. List improvements or impacts on energy, water, waste and recycling, transport, management, indoor environment quality, emissions, ecology, etc.
	What is the impact on our sustainability goals and building performance?
	What is the risk of not implementing the project?
Competency	Do we have the right set of project management and environmental skills and competencies in-house?
	Can we acquire the needed competencies externally?

Source: Adapted from 'The Sigma Business Case Tool', Sigma Guidelines.

Worksheet 3.1C

Sustainability project payback – worked example

This is a worked example of the cost benefit of upgrading a new lighting system.
Use this as a guide to evaluate the payback on sustainability projects. This is an example only – adapt this worksheet to suit your organisation's requirements.

Project name:	**Upgrade to new lighting system**			
	Existing fixture		**New fixture**	
Lamp type	Standard fluorescent		Triphosphor fluorescent	
1. Power input				
Number of fittings	20		21	
Number of lamps per fitting	2		1	
Total number of lamps	40		21	
Power input for each lamp	36	watts	36	watts
Power input for each ballast*	9	watts	4	watts
Total power input = total number of lamps x power input of (lamp + ballast)	1800 = 40 x (36+9)	watts	756* = 21 x (36+4-4)	watts
2. Annual energy consumption by converting power input to kilowatt hours (kWh)				
Operating hours per year	3000	hours	3000	hours
Total annual energy consumption = total power input/1000 x operating hours per year	5400 = 1800 watts x 3000hr/1000	kWh	2268 = 756 watts x 3000hr/1000	kWh
3. Annual lighting energy costs				
Average electricity price ($ per kWh)	$0.10		$0.10	
Total annual lighting energy costs = energy cost x total energy consumption	$540 = $0.10 x 5400	kWh	$227 = $0.10 x 2268	kWh
4. Annual savings				
Energy saved = total energy consumption of (existing lights – new lights) Any additional hidden savings?	3132 = 5400-2268	kWh		

*Note: an electronic ballast will run a lamp at a lower wattage (i.e. 32 W) but there is still a ballast loss of 4 W. Therefore the power input for one lamp and the ballast = 36 W

Project name:	**Upgrade to new lighting system**	
	Existing fixture	**New fixture**
Lamp type	Standard fluorescent	Triphosphor fluorescent
Is the space air conditioned? If yes, 25% more energy savings can be made. If no, use initial energy savings calculated.	3915 kWh = 3132 x 1.25	
Total energy to be saved per year	3915 kWh	
Dollar savings per year = energy cost x total energy savings per year	$391.50	= $0.10 x 3915
Annual maintenance cost saved	$50	
Total dollar savings per year	$441.50 kWh	
Estimated conversion cost (parts and labour)	$1500.00	
5. Simple payback		
= conversion cost/total annual savings	3.4 years = $1500/$441.50	
Annual rate of return (ROR) = total dollar savings per year/conversion cost x 100	29% = $441.5/$1500 x 100	A 100% ROR means that the energy savings will pay back the conversion cost within one year. In this case it will be paid back in under a year
6. Greenhouse gas reduction	1 kWh = 1.06 kg CO_2, 1 MWh = 1.06 t CO_2[1]	
= total energy savings/1000 x 1.06 = tonnes of CO_2 abated	4.2 tonnes = 3915 kWh/1000 x 1.08	
On average, 1 car produces 4.5 tonnes of CO_2 in a year	Almost 1 car tonnes = 4.2/4.5	

[1] NSW emission factor (full fuel cycle) for electricity purchased by end users, 'National Greenhouse Accounts (NGA) Factors', Australian Government Department of Climate Change 2008 (www.climatechange.gov.au/workbook/index.html)

Sustainability and property acquisitions

3.2

Context

This section explains how to identify a commercial property's sustainability performance as part of its acquisition process.

The majority of existing buildings were not built with good sustainability practices in mind. Some perform well but others perform badly, with their performance across the board often inconsistent against rating tools and guides such as the National Australian Built Environment Rating System (NABERS), Green Building Council of Australia's Green Star and the Property Council of Australia's *A Guide to Office Building Quality*.

NABERS tools for commercial office buildings currently include NABERS Energy, NABERS Water, NABERS Waste and NABERS Indoor Environment. NABERS assesses the actual environmental impact of existing buildngs over the previous 12 months, whereas Green Star is a design tool aimed at reducing a range of environmental impacts in new buildings and fitouts. Performance varies with location, orientation, construction, plant, operation and other factors but good performance is often achieved because of good management rather than the systems in place.

In regard to sustainability the purchaser needs to know:

- how the building is performing, and how it rates using the appropriate industry environmental ratings tool and guidelines
- what its impact will be on the environmental performance of the whole property portfolio
- whether it will attract or retain tenants who are looking for accommodation with good environmental performance
- how, and at what cost, it can be improved to higher standards in the future.

What's in this section

The pre-acquisition inspection and assessment process is usually extremely busy and involves sorting and reviewing a lot of information in time for the purchaser to make a decision to proceed. This process requires an experienced team that is well briefed and able to plan and manage its work within a limited time frame.

All buildings are very different and a specific, detailed briefing is needed to make sure all the required information will be collected.

Until recently, pre-acquisition building inspections and technical due diligence (TDD) focused on identifying defects and risks relating to the physical condition of a property and its equipment, and assessing its level of compliance with environmental regulations. This data gathering and assessment process could be used to greater advantage. An astute purchaser will also want to know if the building can achieve the higher levels of energy efficiency expected by the market and at what price. In some properties it's relatively easy and inexpensive to improve energy efficiency; in buildings where no upgrading has occurred there will be easy wins. However, there are a few buildings where achieving energy efficiency, particularly the standards required by government tenants, will require significant investment. Information about the work this will entail and its likely costs and timing may affect the building's purchase price.

This information can also be beneficial when developing new performance standards for building service contracts or when negotiating new tenant leases. Timing of upgrading or refurbishment will normally be coordinated to coincide with lease renewals, rent reviews or re-leasing and this can also be factored in to the pre-purchase sustainability assessment.

Other areas that until recently were often not included in the acquisition review process are occupational health and safety and indoor environment quality, which includes indoor air quality. Tenants are far more aware of the risks from sick buildings and buildings with poor air circulation than ever before. Many tenants now understand that workplace productivity and their potential for attracting and retaining staff will be affected by the building they occupy. This in turn affects the demand and long-term marketability of the building. These aspects should all be considered when deciding whether to purchase and how much to pay.

Technical due diligence is usually an intensive process. Adding in the assessment of a building's environmental performance and environmental potential during acquisition increases the amount of detailed work required. It is unlikely that this work can be carried out within four weeks or less – the traditional time allowed. Time required will depend on the building and scope of work, but you should allow six to eight weeks to give enough time for a fully considered assessment.

What to look for

Look for aspects of flexibility in the building that would allow new systems to be incorporated. Review the fundamentally green aspects of the building including:

- Orientation and overshadowing
- Floor plate proportions (distance from window to core)
- Natural light
- Façade design and likely thermal efficiency
- Openable windows
- Floor to ceiling heights to allow maximum flexibility
- Riser duct space
- Car park or external space for waste management, water tanks, bike facilities
- Location of public transport.

Steps: Including sustainability in the acquisition review process

1 Brief the inspection team

Make sustainability evaluation part of the brief to the building inspection or TDD team. The traditional acquisition team skill set may need to be expanded to include this expertise. The team will need to ensure the purchaser obtains enough information about the building's performance to make an informed decision about the likely sustainability-related risks and opportunities entailed in the purchase.

Brief the inspection team on:

- the long-term strategy for the building, including whether it will be held or upgraded and sold
- whether the building will be upgraded immediately or over a longer term
- profiles of tenants to be targeted
- the performance standards, ratings and grades the building will be required to achieve.

It's important that the purchaser defines the target performance to be used in the team's report.

The team's job is to help the purchaser identify possible risks to capital and operational budgets, as well as possible risks to reputation. This may include looking out for issues that may be difficult to quantify at present but could have an impact in the future, such as a low NABERS Energy rating, making it difficult to attract tenants.

2 Gather information

Give the vendor a list of the information required for the sustainability assessment (see Step 3). This should be done at the earliest opportunity.

Carry out a site inspection jointly with the inspection team. Verify key data provided by the vendor and add additional information gained during the inspection.

3 Assess the property and benchmark it

Depending on the performance requirements or rating targets set by the purchaser, use Worksheet 3.2A: 'Sustainability evaluation – property acquisition phase', and NABERS Water, Energy, Waste and Indoor Environment to evaluate the building's current sustainability performance. The NABERS online self-assessment tool can also be used to benchmark the building's performance (www.nabers.com.au).

About NABERS

NABERS is the National Australian Built Environment Rating System managed by the Department of Environment and Climate Change NSW. NABERS is a performance-based rating system which measures the operational environmental impacts of existing buildings.

NABERS office tools can be applied to three distinct situations:

- **Tenancy** ratings that cover the space occupied by a single tenant and under the control of that tenant
- **Base Building** ratings that cover all office spaces for that building, and measure the parameters that are under the control of the landlord or base building
- **Whole Building** ratings that are a combination of both Tenancy and Base Building for the situation where a tenant is the owner and/or has control of all services.

For more information see www.nabers.com.au

You could also review the likely Property Council of Australia quality grading of the building and consider how the building will perform against its criteria – but again, this depends on the purchaser's defined requirements.

Identify aspects of the property's current performance that could be upgraded or that need to be upgraded to improve its sustainability performance.

4 Coordinate reporting

To gain the most value from this assessment, include the sustainability performance and associated costs and timing as part of the building inspection or TDD report. Ensure team members coordinate their findings and recommendations to avoid doubling up, missing or contradicting advice. For example, work recommended by a building services specialist may be superseded by the need to carry out an energy efficiency upgrade.

5 Develop a property improvement strategy

If the acquisition proceeds, develop a property improvement strategy listing key actions and initiatives to be undertaken based on the information obtained during the acquisition review process.

NABERS at acquisition

NABERS ratings, particularly NABERS Energy, are now embedded into the business strategies of Australia's property industry. NABERS ratings are a fundamental component in property acquisitions, strongly influencing whether buildings are bought or sold.

Before investing in a property, investors:

- determine the current NABERS rating of the building
- assess the potential for this rating to be improved, through due diligence processes.

Buildings with a high rating or the potential to achieve a high rating are a better investment due to lower operating costs, attractiveness to tenants, and protection against future growth in demand for efficient buildings. Additionally, many investors have set requirements for their buildings as a corporate responsibility, and must report ratings annually. Higher rated buildings will meet these requirements.

For more information see www.nabers.com.au

Worksheet

Review and use this Word document:

3.2A Sustainability evaluation – property acquisition phase

Worksheet 3.2A

Sustainability evaluation – property acquisition phase

The following evaluation should be undertaken with the help of technical specialists during the acquisition or handover period and given to the acquiring fund manager or portfolio manager. This worksheet includes both office space and retail space. This is an example only – adapt this worksheet to suit your organisation's requirements. Delete the sections not relevant to the property under review.

Section A: Property details			
Building/Centre name		City	
Street address			
Building age			

Size:		Building functions:	
No. of levels (excluding basement)		Office space	m^2
Gross floor area	m^2	Retail	m^2
Building net lettable area (NLA) incl. vacancies	m^2	Food outlets	m^2
No. of car parking levels (or area in $m^{2)}$		Carpark	m^2
Basement size	m^2	Other (list)	m^2
No. of car parking spaces			m^2
No. of disabled parking spaces			
No. of lifts, escalators and travelators			

Office tenancy			**Occupancy/use**	
Major tenants	% NLA occupied	No. staff	Total no. building occupants (excl. visitors and building contractors)	
			Standard weekly hours of operation	
			No. of floors with 24/7 operation	
			% vacancy (at time of assessment)	
No. of tenancies:				

Retail capacity			**Occupancy/visitation**	
	Number	GLAR	Hours of annual occupancy	
Specialty tenants			Annual total visitation	
Major tenants			Peak visitation (people/day)	
No. of tenancies			Standard weekly hours of operation	
% vacancy (at time of assessment)			No. of levels with 24/7 operation	

Industry benchmarks				
NABERS Rating	Base	Tenancy	PCA Grade (Guide to Office Building Quality)	
NABERS Energy			Green Star Rating (specify tool number used)	

NABERS Water NABERS Waste		n.a.		
NABERS IE				

Energy and greenhouse performance

Monthly performance (base building)	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**
Electricity consumption total kWh												
MJ/m^2 NLA or GLA												
Electricity costs total $												
$/$m^2$ NLA or GLA												
Gas consumption total MJ												
MJ/m^2 NLA or GLA												
Gas costs total $												
$/$m^2$ NLA or GLA												

Note: the above information may be available from property utility accounts or other property management records.

Year:		**200X**	**200Y**	Comments on any aspect of energy consumption or cost of energy supply.
HVAC electricity consumption (if known)	kWh			
	kWh/m^2			
After hours HVAC electricity (if known)	kWh			
	kWh/m^2			
Is there an Energy Management Plan (or similar) in place? If so, include a copy with this evaluation.				

Industry benchmarks

How does base building electricity consumption costs ($/$m^2$ NLA) relate to PCA operational benchmarks for a building of this category and NLA/GLA?	
Has a NABERS Energy, Water or Waste rating been undertaken? If so, list outcomes and name of organisation that undertook the rating.	

Greenhouse and global warming

	Units Tonnes $CO_{2\text{-}e}$ or kg $CO_{2\text{-}e}/m^2$	**200X**	**200Y**	**NABERS Energy** Most recent accredited NABERS Energy rating
Total GHG emissions				

What are the likely energy improvement measures that could be implemented to raise the NABERS Energy rating by 1 star?	
to 2 stars?	
to 3 stars?	
Estimate an indicative capital budget associated with raising the NABERS Energy rating to: 3 stars	
4.5 stars	
Is a refrigerant leak detection system installed?	

HVAC system

Briefly describe the **HVAC system** and its key components including any energy efficiency features.	Number	Type	Capacity and efficiency	Age
boiler plant				
chiller plant				
cooling towers				
air handling systems				
water reticulation systems				
air filtration systems				

Briefly describe the scope of the HVAC control systems and impact on energy efficiency:	
type (e.g. pneumatic, electronic, DDC)	
control of HVAC systems	
economy cycles	
night purge	
Has an energy audit been undertaken in the last 5 years? What improvements have been implemented?	
Describe the carpark and basement ventilation system. Is carbon monoxide monitoring provided? Have any ventilation improvements been made as a result of poor air quality?	
Describe the domestic hot water systems installed in the building.	
Does the building have CO_2 monitoring to tenant areas? Provide details:	

Is power factor correction installed in the building? Provide details.	
List scope of energy sub metering systems i.e.	
house power	
lifts	
mechanical	
carpark	
gas	
Are these monitored on a monthly basis?	

Lighting

Briefly describe the lighting system including energy efficiency features:	
tenant controls	
lighting controls	
types of luminaires	
lighting zones (size in m^2/number/floor)	
dimming systems	
after hours controls	

Water and wastewater

	Units	**200X**	**200Y**		**Units**	**200X**	**200Y**
Total water consumption (mains supply)	kL			Cost of mains water	Total $		
					$/kL		
	kL/m^2			Cost of effluent discharge	$		
					$/$m^2$		

Quarterly performance (200X)	July to September	October to December	January to March	April to June
Consumption (kL)				
Supply costs				

Toilets			**Urinals**		
Flush volume	Number of women's	Number of men's	Type	Number	Flush volume
6/3 L dual flush			Manual flush		
9/4.5 L dual flush			Sensor-operated flush		
6 L full flush			Waterless		
9 L full flush			Other		
11 L full flush					

Showers		**Basins in amenities**		
Number	Flow rate (L/min)	Number	Tap type	Tap flow rate (L/min)

Water storage tanks			**Cooling towers**		
Capacity (kL)	No.	Location/use	Type	Refrigeration capacity (kWh)	Operating times

NABERS Water rating	
How do water supply and wastewater costs ($/m^2/pa) relate to the PCA operating cost benchmarks for a building of this type and NLA/GLA?	
Are submeters installed to monitor tenants' consumption and major water-consuming equipment? If so, provide a breakdown of % of total water use for each metered component. Are these submeters connected to a stand-alone system for monitoring?	
Have any water leaks been identified and repaired in the past 2 years?	
List any water saving devices used in the building (e.g. flow restrictors, low-flow shower heads, automatic taps etc)	
Is stormwater or rainwater collected and stored for use on site? If so, describe storage capacity and use.	

Waste and recycling

	Unit	**200X**	**200Y**		**Unit**	**200X**	**200Y**
Total solid waste sent to landfill	T			Annual cost of waste collection sent to landfill (collection, transport and tip fees)	$		
					$/m^2		
Total paper and cardboard waste collected for recycling	T			Annual cost of paper and cardboard collection and removal	$		
					$/m^2		
Total other recyclables (e.g. commingled containers)	T			Annual cost of other recyclables collection and removal	$		
					$/m^2		

NABERS Waste rating	
Is there a current Waste Management Plan in place, or similar e.g. waste minimisation strategy, to reduce waste going to landfill (e.g. increase recycling)? If so, attach a copy to this evaluation.	
Has a waste audit been undertaken in the last 5 years? If so, attach a copy to this evaluation.	
Describe the waste recycling system in major tenancies e.g. plastics, paper & cardboard, organics etc.	

Describe the waste recycling systems or infrastructure (e.g. compactors) in the base building e.g. plastics, paper & cardboard, organics etc.	
Describe any additional waste recycling or collection systems in the building for other materials e.g. fluorescent tubes, batteries, mobile phones, construction & demolition waste, furniture, electrical equipment etc.	

Workplace productivity

Is there a history of tenant concerns relating to poor indoor air quality? If so, what actions have been taken to address these concerns?	
Have regular air quality audits been undertaken? List key issues identified and rectification measures implemented.	
Has a hazardous material audit been undertaken within the last 2 years? List any key recommendations from the environmental due diligence assessment.	
NABERS Indoor Environment rating	

Transport and accessibility

Distance from bus stop	m	Disabled toilets on each occupied floor?	Y/N
Distance from nearest train station	m	Estimated workforce using public transport	%
Distance from public carpark	m	No. of designated motor bike spaces provided	
Disabled access from street to lift lobby?	Y/N	No. of designated bicycle spaces provided	
Disabled access from carpark to lift lobby?	Y/N	No. of shower facilities for cyclists	
Secure bike storage	Y/N		

List specific facilities for disabled accessibility (e.g. lifts, toilets etc)

Ecological diversity

Are there any trees on site subject to Council Tree Preservation Orders? Does the location of these trees impede future redevelopment (if intended)?	
Are there any areas of natural vegetation or wetlands on site that may have some ecological conservation value? If so, describe them. For example, old growth forests. See Green Star – Ecological (ECO – Conditional Requirement) Does the location of these areas impact or need to be considered in future redevelopment potential (if intended)?	
Does the site have a history of soil or groundwater contamination? List any key recommendations from the environmental due diligence assessment.	

Heritage conservation

Is there a current Heritage Conservation Order (or similar) on part of the site or the entire site? If so, describe the subject and the area of site affected.	

Tenant engagement and green leases

3.3

Context

Tenants are starting to ask questions about how sustainable their building and tenancy is ...'How energy efficient is this building? What is its NABERS Energy rating? Are we conserving water? Where does our recycling go? What is our carbon footprint? How good is our indoor environment quality?'

As well as being the impetus for requests like these, sustainability presents a great opportunity to create or consolidate valued relationships with your tenants. This in turn can reduce the likelihood of churn and help improve the environmental performance of the whole property.

Achieving your sustainable property commitments will usually require your tenants' involvement, and leasing arrangements can provide an ideal framework for this type of relationship. By fostering collaboration and sharing of financial or less-tangible benefits, leasing arrangements can help tenants establish more sustainable practices and open the door to tenant-driven sustainability improvements. Tenants can also help with promoting environmental and workplace improvements.

Tenants with green credentials or wanting to reduce their environmental impact are likely to be attracted to buildings that demonstrate a high level of sustainability performance. Finding a proactive building manager ready to help them achieve their goals may just seal the deal.

What's in this section

Steps: Actions to engage tenants

1 Improve your own performance

Lead by example: set targets and measure and report your own sustainability performance. Back this up by obtaining industry-recognised environmental credentials such as a NABERS rating. Make sure the rating is accredited so you can use it to market and promote your property.

Be proactive with operations and maintenance. Work with your tenants and look for continual environmental improvement.

2 Adapt existing building rules or user manuals

Adapt existing building rules or user manuals to include sustainability criteria. Clearly set out environmental requirements such as:

- instructions for using waste and recycling systems
- energy efficiency measures e.g. lighting controls and the need to turn off lights and equipment after hours
- water efficiency measures and the need to report leaks promptly.

Spell out your commitments as well, for example:

- monitoring and reporting sustainability performance
- maintaining a current NABERS rating
- providing bicycle storage and showers.

Examples of sustainability-related clauses that could be included in standard building rules and regulations are provided in Worksheet 3.3A.

Make sure tenant's operational policies and practices are consistent with the base building sustainability objectives and rules. This is especially important if tenants contract their own cleaning, waste disposal or recycling services.

3 Use a 'green lease'

A 'green lease' is any lease aiming to achieve sustainability outcomes – this concept is still being developed. A green lease can help you establish environmental and social objectives as part of the relationship with your tenant. You could use a green lease to complement the sustainability provisions in your building user rules and regulations. A leasing arrangement can be more comprehensive than user rules, placing obligations on both the building owner and tenant, and prescribing a partnership approach.

Green leases range from being prescriptive to collaborative. Strict requirements or commitments may be difficult or costly to enforce. The way in which tenants operate can have negative affects on the building rating; similarly the way the building is set up and operated can affect the tenant. There is therefore a case for collaboration but parties need to perform to agreed parameters.

Green leases include clauses on how the parties should work together and establish agreed parameters. You can also use a

Sustainability Advantage

Sustainability Advantage is a business support service from the Department of Environment and Climate Change NSW (DECC). It is designed to help businesses understand sustainability, successfully manage their operations to achieve better environmental outcomes and add business value.

Sustainability Advantage participants have the option to undertake a Staff Engagement module. With the support of DECC and their contractors, your organisation is supported to understand the principles and priorities for staff engagement and identify engagement leaders. Structured workshops will then allow you to:

- draft a staff engagement plan, ensuring tasks are linked to sustainability actions and goals
- implement the actions in the engagement plan with your staff.

For more information please contact Business Partnerships on (02) 8837 6000 or email sustainbus@environment.nsw.gov.au

green lease to educate tenants about implementing a sustainable fitout or running their office more sustainably. Some leasing agreements outline specific environmental management obligations for tenants, often relating to regulatory compliance.

Worksheet 3.3B is a checklist of issues that you could address using a green lease. Seek legal advice regarding the preparation and use of a green lease.

Green Lease Guide

As a starting point for collaborating with tenants on sustainability improvements, you could provide tenants with a copy of the *Green Lease Guide for commercial office tenants* (see www.livingthing.net.au/RC_Guide.htm#i16).

The Guide explains how base building attributes can benefit tenants and gives advice about sustainable commercial fitouts and sustainable ongoing management and operation. The Guide explains:

- what a green lease is, and what the benefits are
- what to look for when choosing which building to lease
- what to consider when making decisions about an office fitout
- what can be implemented into everyday office operations e.g. waste and recycling systems, purchasing recycled-content consumables and energy efficient office equipment.

The Guide was developed in partnership with Investa Property Group, the Department of Environment and Climate Change NSW, City of Sydney, City of Melbourne and the Institute for Sustainable Futures at the University of Technology, Sydney.

Green Lease Schedules

The *Green Lease Schedules* were developed by the Commonwealth Government to give Commonwealth agencies a legal mechanism for implementing the Energy Efficiency in Government Operations (EEGO) policy. The Schedules are separate from the lease so if there is a breach of the environmental provisions, it does not constitute a breach of the lease. The Schedules provide example clauses for different situations, e.g. gross and net leases with different levels of building occupancy (e.g. tenant occupies whole or part of the building). The Schedules can be found on the Department of the Environment, Water, Heritage and the Arts website at www.environment.gov.au/settlements/government/

Why Investa encourages green leases

'Every time we negotiate a green lease with a tenant we are looking for ways to achieve multiple outputs for each input. We attempt to link their goals with ours. Take enhanced natural light for example: the right design treatment will enhance productivity and enjoyment, reduce energy use and, ultimately, it should encourage a tenant to stay with the building long term.'

Craig Roussac, General Manager – Sustainability, Safety and Environment, Investa Property Group

Commonwealth Government Green Lease Schedules

There are 8 Green Lease Schedules, designed for a variety of situations. Features include:

- reporting requirements for energy use
- energy intensity targets
- energy efficiency to be achieved
- minimum energy performance standards for new leases
- minimum energy performance for new office buildings or major refurbishments
- energy management strategies to be established
- building management committees to be set up and run.

For more information see www.greenhouse.gov.au/government/index.html

Specific environmental obligations

Specific environmental management or regulatory compliance issues can be included in a lease. Tenants who may have high environmental risk activities can be required to develop and implement an environmental management system (EMS) or plan (EMP) to help them address their environmental risks, achieve environmental targets or goals and demonstrate due diligence.

4 Educate and support tenants

Implement a strategy to educate and support tenants in adopting more sustainable practices. Focus on existing tenants as well as new ones – this might tip the balance in your favour when it comes to renewing a lease. Here are some strategies you might consider:

Provide a Welcome Pack or Building User Guide

Give new tenants comprehensive information about the sustainability performance of the base building and how to use its sustainability features (e.g. how to use external blinds). Provide information on issues of importance to staff such as access to public transport, use of bicycle storage, recycling initiatives, etc. Welcome packs can also be used to encourage feedback as tenants settle in, and tenants can use them as part of an induction pack for new staff.

Provide fitout advice and support

Where new or existing tenants are planning accommodation upgrades or office fitouts, help them by providing advice about integrating sustainability criteria into their plans. Explain that the benefits could include more than utility cost savings. Organisations may find they can boost productivity and attract and retain staff by creating a more vibrant, environmentally friendly and healthy workplace.

Section 4.3 provides advice about sustainable fitouts and engaging tenants, including examples for retail tenants and a case study on GPT's retail tenant engagement initiative. Worksheet 4.3A is a checklist for sustainable fitouts that may be useful for tenants and their design teams.

Monitor tenant performance

Help tenants collect data about energy, water and waste. Some tenants might be reporting their sustainability performance publicly, particularly if they have off-site manufacturing plants. They might not have considered the impacts of their corporate operations and if they are reporting using international standards (e.g. Global Reporting Initiative) they will require specific resource consumption

The Investa Greenhouse Guarantee – an energy saving initiative for tenants

'Investa Property Group provides new and existing tenants with an opportunity to save on energy bills through better energy management. Tenants enter into the Investa Greenhouse Guarantee either by acquiring more energy efficient equipment or by having more substantial energy saving measures built into their fitout. Greenhouse reduction initiatives are identified through a site audit process. The Guarantee sets targets for reduced energy consumption. If the targets are not achieved and extra energy is used, the cost of that extra consumption is refunded to the tenant and GreenPower is purchased to achieve the targeted greenhouse emission reductions.

Launched in 2005, the Guarantee can be included with a standard lease. Under the agreement tenants receive:

- a guaranteed cap on energy bills
- a guaranteed cap on greenhouse emissions
- a NABERS Energy Commitment Rating certificate
- guaranteed NABERS Energy performance ratings
- regular performance reports to help with internal reporting and marketing to staff, clients and other stakeholders.

Savings of up to 20–30% on tenant's energy bills are possible, and capital costs are recoverable within two years. The Guarantee also reduces a tenant's total cost of occupancy. For example, moving from a 0-star rated tenancy to a 5-star rated tenancy can reduce annual energy bills from $\$21/m^2$ to $\$8/m^2$. As at 30 June 2008, Investa had Greenhouse Guarantees covering over 56,000 m^2. This is providing combined annual savings of $245,000 to tenants, and abating approximately 2,400 tonnes of CO_2 emissions per year.'

Investa Property Group, www.investa.com.au

information. Investigate opportunities for separate metering systems, perhaps sharing the cost between the property owner and tenants.

Help tenants become more sustainable

You may be able to help tenants become more sustainable by providing them with access to whole-of-building services that are more cost effective than tenancy-based services. For example, providing shared bicycle storage and showers, conducting waste audits to help reduce contamination in the recycling stream or purchasing GreenPower through the property's energy contract.

Host environmental events and campaigns

Invite tenants to information events about the sustainability performance of the property or planned sustainability upgrades. Host events that are themed around environmental issues e.g. hold a WaterWise Week promoting more efficient use of water in the building.

Encourage tenants to be more sustainable at home as well. For example, tenants might be interested in:

- taking the Australian Conservation Foundation's GreenHome Challenge and calculating their environmental impact using the Eco-calculator: www.acfonline.org.au
- rating their home energy and water use using NABERS: www.nabers.com.au
- visiting 'Our Environment, It's a Living Thing' for more tips and interactive tools: www.livingthing.net.au

Tap in to existing environmental programs and campaigns to help tenants become more sustainable. Examples are provided at the end of this chapter.

5 Measure and report back to tenants

Measure and report back to tenants to demonstrate improvements in the sustainability performance of the property. Report back on:

- trends in energy and water use – use abnormalities as a call to action
- waste and recycling rates – report on other base building recycling initiatives too, e.g. recycling of fluorescent tubes
- improvements in indoor environment quality – explain the links to productivity improvements
- sustainable refurbishment activities in common areas and other tenants' sustainable fitouts – seek out examples showing what can be achieved.

True Green @ Work

Encourage tenants to tap into the many sources of information about making workplaces more environmentally friendly. For example, *True Green @ Work* provides a list of 100 simple ways to improve the work environment: see www.betruegreen.com/files/files/TG%20Work%20order%20form.pdf

Check whether any data you're providing is easy for others to understand (ask a sample group for feedback first, before sending out the report to the whole building). Obtain accredited environmental ratings (e.g. NABERS and Green Star) to provide tenants with third party certification for environmental performance.

Where appropriate provide submetering and report individual tenancy performance.

Your reporting methods could include:

- using newsletters – include environmental tips e.g. turn off computers at power points
- using noticeboards or audiovisual screens in common areas or lifts
- celebrating achievements – e.g. holding a morning tea when targets are met and publicising the improvements.

Encourage feedback from tenants through targeted surveys relating to, for example, indoor environment quality (see Section 3.8) or through less formal means such as regular discussions between building management and tenants.

Determining your approach – issues to consider

- Is the tenant driven solely by financial criteria? This might influence how you present the business case to secure their commitment.
- Does the tenant publicly promote its sustainability credentials? If so, look for opportunities to support them through their tenancy occupation.
- Could high profile tenants help to drive change in the tenancy market if they were to champion green tenancy ideas? If so, there may be an incentive to build sustainability into the relationship strategy with these prospective or existing tenants.
- Can whole-of-building programs be initiated or improved through multiple tenant cooperation? For example, some waste recycling initiatives may only be viable if a majority or all tenancies agree to participate. If several tenants have made a commitment to participate in a whole-of-building program this might help to convince less aware or less motivated tenants to join in.
- Would a 'green lease' be an effective vehicle for engaging and implementing building owner–tenant environmental initiatives and ensuring more sustainable behaviour?

Smaller carbon footprint for Sydney's foreshore

'The Sydney Harbour Foreshore Authority is actively working with tenants to move towards an 80% reduction in carbon footprint by 2020 for The Rocks, Darling Harbour and Barangaroo. These are the first precincts in NSW to set eco-footprint reduction targets.

Local restaurants, galleries, museums and shops are very supportive, and have participated in workshops provided by the Foreshore Authority on making their businesses more environmentally sustainable. The Foreshore Authority has also carried out an independent audit of the environmental impact of 11 local businesses, looking at water and energy use, transport and waste. This included Amo Roma restaurant, the Museum of Contemporary Art, Done Art and Design, Subway, Sydney Harbour Bed and Breakfast, the Australian Hotel, the Mercantile Hotel, Aurora Exhibitions, and more.

Owner of Amo Roma, Charif Kazal, welcomed the initiative. "People are now very conscious of the environment and this is a positive way to help businesses save money and help the environment,' Mr Kazal said. 'This is also an excellent example of how even heritage precincts such as The Rocks can make changes to improve their sustainability."'

Sydney Harbour Foreshore Authority

Cartridges 4 Planet Ark

'Printer cartridges are made up of a complex mix of plastics, metals and inks and toners. Throwing them into the garbage wastes these resources. By recycling them you'll save energy, water and cut greenhouse gasses. We also guarantee "zero waste to landfill".'

Planet Ark

- What impact does a net or gross leasing arrangement have on your green lease concept? Which option provides you and your tenant with more incentive to reduce energy and water use (and operating costs)?
- Can tenant feedback initiatives be improved? Tenants need to know in advance how and when structured feedback will be gathered so they can canvass their staff and obtain a representative opinion.
- Is there a system in place to inform tenants' suppliers and contractors about the accepted sustainability practices at the property, particularly relating to avoiding contamination of the waste system, handling of hazardous materials or use of vehicles and staff amenities? It should be clear to tenants that their suppliers and contractors accessing the property need to comply with lease rules and obligations.

Campaigns

Here are some ideas for campaigns and initiatives you could encourage your tenants to join, offering to collaborate or support their participation where appropriate.

CitySwitch Green Office

CitySwitch Green Office is a national tenant energy management program run in partnership between the cities of Sydney, North Sydney, Parramatta, Willoughby, Adelaide, Brisbane, Melbourne and Perth, and the Department of Environment and Climate Change NSW and Sustainability Victoria. CitySwitch signatories commit to achieving and maintaining an accredited 4 stars or higher NABERS Energy tenancy rating. NABERS Energy measures and rates a tenancy's actual yearly greenhouse gas emissions using 12 months of energy bills. Practical suggestions to improve office energy efficiency include:

- changing to flat screen monitors
- activating sleep mode on equipment where applicable
- upgrading lighting controls including occupancy sensors and timers
- purchasing accredited GreenPower.

Ask a CitySwitch representative to meet with you and your tenants to explain the program. For more information see www.cityswitch.net.au or phone (02) 9265 9852.

Cartridges 4 Planet Ark

For more information or to register for a free 'Cartridges 4 Planet Ark' collection box visit http://cartridges.planetark.org/involvement/get-invoved.cfm or call the hotline on 1800 24 24 73.

SEE Sustainability @ Work – Australian National University

'The award winning ANUgreen program at the Australian National University in Canberra has sought to change the culture of resource consumption throughout the university through the development of its SEE Sustainability @ Work program ('Social, Economic, Environmental sustainability @ Work' or 'SEES@W').

A key aim of the program is to build the capacity of organisational units within the university to manage and reduce their own ecological footprint, in either an office or lab setting. The program points out the business case for environmental sustainability to managers, provides training and support to interested staff and students, known as 'Green Reps' across campus, to champion environmental issues in their local area, and encourages the incorporation of environmental best practice into business operations.

At its simplest level, Green Reps seek to establish 'green office culture'. This can be by disseminating fortnightly sustainability email updates to colleagues, making sustainability a permanent agenda item at staff meetings, displaying environmental awareness raising posters strategically around the building, and promoting simple competitions to engage their colleagues in more sustainable behaviours.

Beyond this, the SEES@W program provides resources and training to build the Green Reps capacity to foster change, as well as assisting organisational units to undertake an environmental audit, and providing guidance to help implement recommendations.'

For more information about SEES@W visit www.anu.edu.au/anugreen

MobileMuster

Encourage your tenants to use MobileMuster instead of placing mobile phones in the waste bin.

- Provide MobileMuster collection bins and use the free pick up and exchange service.
- Use the resources provided by MobileMuster to promote this campaign (e.g. template media releases, fact sheets, brochures, posters, stickers, screensaver, mouse mats).
- Promote MobileMuster on your website.

For more information see www.mobilemuster.com.au

Earth Hour

On 31 March 2007, more than 2 million Sydney businesses and households turned off their lights for one hour. Earth Hour went international in 2008, and now this event will held at the end of March every year. Find out how your building can continue the good work. This is a great initiative in which you and all your tenants can become involved. Marketing material is available from the event organisers.

For more information see www.earthhour.com

'Cycle to Work' or 'Walk to Work' days

For more information see

- www.walk.com.au/WTW/page.asp
- www.rta.nsw.gov.au/usingroads/downloads/cycling_to_work.pdf
- www.cityofsydney.nsw.gov.au/AboutSydney/ParkingAndTransport/Cycling/CycleFriendlyWorkPlaces.asp

Further information

- Australian Conservation Foundation Green Lease, www.acfonline.org.au/news.asp?news_id=535
- 'Lease Arrangements for Green Office Buildings', Freehills, www.freehills.com.au/1917.aspx
- *Green Lease Guide for commercial office tenants*, Investa Property Group, 2006, www.investa.com.au/Common/Pdf/GreenLeaseGuide.pdf
- *Tenant Energy Management Handbook,* www.nabers.com.au
- *True Green @ Work,* Kim McKay & Jenny Bonnin, ABC Books, 2007, www.betruegreen.com/PageGreen.aspx?element=42&category=1
- *ecologic creating a sustainable future*, Sandra McEwen,Powerhouse Publishing, 2004 (reprinted 2005), www.powerhousemuseum.com/publications/publications_item.php?id=64
- Green Pages Business Directory, www.thegreendirectory.com.au/green-pages/green-pages/green-pages/
- Green Building Council of Australia:'Cleaning checklist for your office', www.gbca.org.au/resources/fact-sheets/cleaning-checklist-for-your-office/682.htm
- Sustainability tips for workplaces: www.livingthing.net.au/WYKD_Main.htm

Worksheets

Review and use these Word documents:

3.3A Building rules and regulations – sustainability clauses

3.3B Green lease checklist

Worksheet 3.3A

Building rules and regulations – sustainability clauses

Use of these inserts

The following example clauses are suitable for using in:

- standard building rules and regulations (or similar) within lease agreements
- induction or operation manuals or other similar information about the base building provided to tenants.

Legal advice should be sought if these clauses are inserted into tenders, contracts or leases.

These clauses may need to be adapted to reflect:

- the scope of sustainable property initiatives available in the building
- the property owner's negotiations with tenants about specific sustainable property outcomes.

Make sure any information provided to tenants by service providers such as managing agents or centre managers (such as Tenant Manuals or similar) contains the same wording or conveys the same meaning.

These clauses do not negate, replicate or replace any other standard clauses and should be read in conjunction with the standard clauses. Care should be taken to ensure there is no conflict or confusion between these clauses and existing standard or non-standard clauses in lease agreements (e.g. in regard to cleaning, lighting, air conditioning or waste removal etc.).

Clause 1 'Sustainable fitout' should be reviewed periodically to ensure it captures all practical requirements and supports both the owner's and tenant's sustainable property management objectives.

Encourage tenants to liaise with you if they wish to discuss an environmental initiative relating to their tenancy or the base building's sustainability performance.

Some owners are requiring tenants to achieve minimum NABERS and Green Star ratings for their tenancies, particularly where the building needs to maintain its own base building environmental rating. The extent to which owners will want or need to require tenants to meet minimum standards will depend on factors including the owner's commitment to environmental performance, the leasing market and the need for the tenant to operate in such a way that their tenancy does not reduce the base building rating.

This is an example only – adapt this worksheet to suit your organisation's requirements.

Sustainability

The property owner is committed to managing this property to achieve a high level of sustainability performance. In particular, the:

- efficient use of energy and water
- minimisation of greenhouse gases
- diversion of waste from landfill
- provision of safe and healthy workplaces.

Tenant's commitments

The tenant ensures all practical measures will be taken to occupy the premises in a manner that supports the property owner's sustainability commitments. Notwithstanding any other rule or regulation stated in this [lease agreement/tenant manual], the tenant [will/is encouraged to] take steps to facilitate the following:

1 Sustainable fitout

The tenant will integrate sustainable design and construction goals into fitouts such that energy is used more efficiently, water efficient equipment and appliances are used, toxic or harmful materials are avoided, indoor air quality is maintained at a high level, and fitout waste is diverted from landfill through waste avoidance and minimisation, reuse and recycling initiatives.

The property owner can provide the tenant with a sustainable fitout guide to help in identifying design and construction measures that will create more sustainable and productive workplaces.

The tenant will obtain an environmental rating in accordance with NABERS Energy and the Green Building Council of Australia's Green Star Office Interiors rating schemes. (Required star rating to be included.)

2 Lighting control

The tenant will ensure staff are aware of energy efficient lighting controls, where provided, and observe the need to switch lights off as early as practical in the evenings.

The property owner is willing to discuss potential measures to enable the Building Management and Control System, where possible, to facilitate efficient energy use within tenant-occupied spaces.

3 Waste and recycling

The tenant is encouraged to adopt waste avoidance and minimisation practices and to use the multi-stream waste and recycling collection system where provided by the property owner.

The property owner is willing to investigate potential changes to the building's cleaning and waste removal activities in order to support the tenant implementing a multi-stream waste and recycling system. Such a waste system could include separation of organics (e.g. food waste), plastic, glass and metal containers from paper and cardboard and from residual waste (to landfill). If the tenant wishes to investigate the viability of on-site organic recycling, such as a worm farm, the property owner is willing to discuss the contribution it could make to such an initiative. The owner is also willing to investigate installing a system where the different waste streams can be weighed at an off-site location. (Major tenants may require their waste to be weighed.)

Include instructions on recycling including:

- what can be recycled
- where the recycling storage areas are
- schedules for waste and recycling removal, e.g. cyclical dates on which certain materials, such as e-waste, can be recycled.

4 Energy and greenhouse gas minimisation

The tenant will ensure that it designs, constructs and occupies its premises in such a way that avoids:

- the inefficient use of energy through unapproved manipulation of the property owner's heating, ventilation and air conditioning controls and lighting
- opening windows in extreme weather conditions
- propping open external doors
- overusing lifts where stairs provide a viable alternative
- unnecessary use of lighting
- non-use or misuse of internal blinds or sun control devices provided by the property owner.

Where supplementary air conditioning is required, the tenant is encouraged to select energy efficient equipment.

Computer equipment with active energy efficiency modes is highly recommended. Staff should be trained to turn off computers and other equipment when not in use.

Only energy efficient kitchen water heaters are allowed, with thermostats set to avoid scalding and timers to restrict operations to business hours.

The tenant is encouraged to consider assessing its energy use against the NABERS Energy scheme with a view to achieving a high greenhouse star rating.

5 Water conservation

The tenant is to advise property management immediately of the need to repair or adjust leaking taps, toilet cisterns or urinals provided by the property owner and to similarly promptly attend to leaks in taps or water using equipment provided by the tenant.

Where provided and maintained by the tenant, landscaped areas and planter boxes are to use drought-tolerant species and avoid over-watering by manual or automatic irrigation

systems. Taps, shower fittings and dishwashers with minimum 4 star WELS rating are only to be used.

6 Indoor air and environment quality

The tenant, or any employee, agent, contractor or subcontractor of the tenant, shall not undertake any activity that is likely to or has the potential to adversely affect indoor air quality and environment quality (e.g. noise) either within the premises or elsewhere in the property.

The tenant is to seek written approval from the property owner or the property owner's agent should such activity be likely or unavoidable before any such work is undertaken. Such work should be scheduled for weekends only.

7 Occupant safety

The tenant is to immediately advise the property owner, or the property owner's agent, of any potential risk to occupant safety either within the premises or elsewhere on the property, and is to take steps as necessary to ensure staff, visitors or contractors are aware of the risk or hazard.

8 Transport

The tenant is encouraged to promote the use of public transport to staff and regular visitors. The property owner has provided [secure bicycle storage facilities in the basement / and / common showers for bicycle users] to facilitate bicycle commuting by building occupants. The property owner is willing to discuss further measures that the tenant may wish to take to promote bicycle and public transport alternatives.

Provide local public transport information, maps and timetables, and details or links on alternative methods of transport to the workplace, such as carpooling.

9 Compliance

The tenant is to comply with all applicable environmental and health and safety regulations and requirements of Local, State and Commonwealth Government origin.

Property owner's commitments

10 Sustainability commitment

The property owner will operate and manage the base building to achieve a [insert desired outcome e.g. 4.5-star NABERS Energy/3.5-star NABERS Water /4-star Green Star etc.] rating as determined and formally verified by the relevant industry bodies.

11 Monitor and report sustainability performance

The property owner will ensure the base building sustainability commitment made in [clause 10] will be monitored and performance disclosed regularly. This commitment will be independently verified.

12 Capped energy and greenhouse

The property owner will offer the tenant a capped energy or greenhouse emissions consumption commitment over a fixed period of time, with tenant costs incurred over the agreed cap to be refunded by the property owner.

13 Tenant and property owner's joint commitments

To establish an Environmental Management Committee comprising representatives of the property owner and tenants. The purpose of the committee is to:

- Monitor and improve the environmental performance of the building in accordance with criteria and rating targets
- Monitor and improve the tenants' operations within the building
- Enable the property owner and tenants to optimise their combined environmental performance, and the building's environmental performance, through collaboration
- Initiatiate improvement in environmental performance as standards change
- Review upgrades and improvements planned, faults, occupational health and safety and other requirements
- Provide guidance to the property owners with regard to environmental improvements.

Environmental performance criteria includes, but should not be limited to:

- energy efficiency
- water efficiency
- waste efficiency
- indoor environmental quality
- transport
- emissions
- management systems
- materials
- building efficiency for future improvements in the environmental performance of the building and tenancy.

For additional information see:

- NABERS, www.nabers.com.au
- Green Building Council of Australia Green Star rating tools, www.gbca.org.au/green-star/rating-tools/
- Energy Efficiency in Government Operations (EEGO) www.environment.gov.au/settlements/government/eego/index.html

Worksheet 3.3B

Green lease checklist

In addition to conventional lease components, the following potential inclusions in a commercial property green lease are based on information provided by Australian law firm Freehills and the Corporate Realty, Design and Management Institute of America (www.squarefootage.net).

This is an example only – adapt this worksheet to suit your organisation's requirements.

	Responsibility placed on:		
	Property owner (base building)	Tenant (tenancy)	Both
Targets and benchmarks			
Measurable environmental performance targets and benchmarks are clearly identified and disclosed e.g. 4.5 star NABERS Energy, 5 star Green Star, 4 star NABERS Water, 4 star NABERS Waste or other sustainable property benchmarks.	✓	✓	✓
Separate energy and water metering is provided.	✓		
Base building and tenancy water and energy consumption and greenhouse gas emissions are independently monitored and reported – levels and compliance with targets and benchmarks.			✓
Agreed penalties apply for failing to comply with lease obligations or targets.			✓
Targets are set for minimising waste and increasing recycling.		✓	
Utility bills and greenhouse emissions are capped and tenants receive achievement rewards.			✓
Tenant's environmental obligations and opportunities			
Environmental and social obligations are included in building rules		✓	
A property Environmental Management Plan (or similar) is in place.	✓		
Accredited GreenPower products are purchased.			✓
Liaison with property manager in regard to tenancy or base building maintenance is prompt.		✓	
Tenancy fitouts			
Property owner and tenant require specific environmental design and construction standards and tenancy environmental performance (potentially to a target rating, such as noted above).			✓
Fitout policy includes environmental targets.		✓	
Sustainable fitout advice and guidance is provided to tenant.	✓		
Property owner's environmental obligations and opportunities			
Energy, water and waste performance are regularly audited and disclosed to tenants.	✓		
All fundamental building elements, services and systems are installed and operated with maximum efficiency.	✓		

	Responsibility placed on:		
	Property owner (base building)	Tenant (tenancy)	Both
Response to base building and tenancy performance issues is prompt.			✓
Indoor air quality is [good/excellent].	✓		
Use of CFCs in air conditioning systems is banned	✓		
Smoking in the building and in building surrounds is banned.	✓		
An easily accessible, dedicated and streamed waste and recycling area is provided.	✓		
Checks are in place to ensure recyclable material is actually being recycled.	✓		
Air conditioning levels are monitored and adjusted where necessary to reduce energy use and meet comfort requirements.	✓		
Sufficient bicycle storage and change rooms with showers are provided.	✓		
A sufficiently comprehensive building management and control system (BMCS) that supports real-time monitoring of thermal, energy and water performance of the base building and tenancies is in operation.	✓		
Other components			
Where agreed, clear dispute resolution procedures are supported by an independent annual audit of targets and environmental performances.			✓
Communication between tenant and property management is effective and regular.			✓
Gross lease format applies, with an appropriate escalation clause and expense stop clause to reward the property owner for operating a high-performance building.	✓		
Appropriate operational procedures and BMCS are in place for charging tenants for after-hours or excess energy usage.	✓		
Building operating costs have been comprehensively and equitably defined to protect the interests of the property owner and tenant.	✓		
Terms have been agreed allowing the property owner to amortize the costs of projects that will reduce operating costs and treat those amortization costs as operating costs, as long as they do not exceed savings.	✓		
A 'right to audit' clause is in place, protecting the tenant from overcharges and defining the audit process to protect the property from frivolous audits.			✓
A definition has been established for what constitutes a hazardous material.	✓		
A 'green' cleaning specification (or similar) details the environmental procedures, materials and protocols for cleaning the building in a sustainable manner.	✓		
A 'Tenant Manual and Development Guidelines', or similar, clearly explains the building's sustainability features and the responsibilities of both parties to be aware of correct operating requirements.	✓		

Assessing sustainability performance

3.4

Context

This section explains how to assess your property's sustainability performance and use sustainability benchmarking as an invaluable management tool.

Successful sustainable property management is underpinned by comprehensive knowledge about asset performance and comparisons with industry-recognised benchmarks for best practice. Benchmarking can help you to establish targets for improvement and an action plan for achieving those targets. Choosing the appropriate benchmarks depends on what you are trying to achieve. For example, you might want to:

- benchmark the building's performance internally i.e. across your portfolio
- compare your building's performance against its competitors
- identify improvement targets
- demonstrate your building's performance to stakeholders, e.g. shareholders or tenants
- report performance as part of your governance processes
- report performance against regulated reporting requirements.

Assessing and managing sustainability performance requires a strategy for comprehensive data collection, monitoring and evaluation. Data collection can be linked to existing performance monitoring and reporting practices. It's vital that systems are set up so that future monitoring and management responses can be replicated for each reporting period and become standard practice.

What's in this section

Sustainability at acquisition

For information about assessing property sustainability at the acquisition phase see Section 3.2: 'Sustainability and property acquisitions'.

Steps: Assessing performance

1 Measure baseline performance

Gather data for your property baseline analysis. You could use the data template in Worksheet 3.4A as a guide. Some of this information can be obtained from building management and control systems and utility records, while other aspects will require a site inspection and dedicated monitoring.

This process will increase your knowledge about the physical characteristics of the building that influence its sustainability performance, and will identify data gaps that need to be addressed.

Portfolio performance

Develop a profile of your portfolio and identify the best performers. Determine the average portfolio performance and use this as a basis to measure incremental improvement across the portfolio due to program-specific initiatives. Use your portfolio profile to identify poor performers and look for opportunities to adopt good practices from one property across your portfolio. This is particularly relevant where your portfolio uses multiple managing agents.

2 Benchmark performance

Identify performance criteria you would like to benchmark against. The most important aspect of benchmarking is comparing the building's sustainability performance to others in the market. This gives a good indication of relative performance, not just internal performance.

Evaluate your performance

Compared to the benchmarks:

- How does your building or portfolio rate?
- What percentage of your portfolio is below or above average?

Use your benchmarks to set improvement targets and to identify properties that may need immediate action.

Self-assessment

You can self-assess building environmental performance at no cost using the NABERS performance rating calculator (see www.nabers.com.au). The calculator can be used to rate base buildings, tenancies and whole buildings.

Evaluating the portfolio

'Commonwealth Property Office Fund undertook a portfolio-wide evaluation to identify and establish its baseline across a number of environmental, social and other risk parameters. The identification of strong and weak assets, as well as the portfolio average performance, improved the exchange of information between asset managers and property managers, and improved the ability to introduce program-specific initiatives, and set and track targets during future asset upgrades and acquisitions. It also provided a basis for comparison against industry benchmarks and between similar building portfolios.'

Colonial First State
Global Asset Management 2008

Setting their own benchmarks

Several commercial property owners are setting their own performance goals. For example, in 2008 Stockland set a target of 8% reduction in electricity consumption and greenhouse gas emissions for its Australian office portfolio.

Stockland, www.stockland.com.au

Self-assessment can help you get a rough idea of performance, but you need to be careful that the information you enter is as accurate as possible and conforms to the data needed by the calculators.

For example, if you're using the base building energy calculator, the area should be based on the net lettable area (NLA) minus spaces that can be excluded (e.g. retail areas in an office building) and the energy usage data needs to relate only to the part of the building being rated, e.g. the base building. If the information you enter is not accurate (e.g. using the number of computers on the asset register instead of the number of frequently used computers) the results can be misleading. If you are uncertain about self-assessment look for further information on the NABERS website or seek advice from a NABERS Accredited Assessor.

Accredited assessment

To ensure the accuracy of the results you obtain, and to use the rating to promote your property or organisation, or to use the NABERS trademarks, you must obtain a certified rating from a NABERS Accredited Assessor. Make sure you use an assessor with good knowledge of sustainability practices in both commercial property design and management. A list of assessors is available at www.nabers.com.au. An Accredited Assessor can also give you general advice or help you with an unofficial self-assessment.

Renewing your rating

Make sure your rating is kept up-to-date otherwise you may be communicating false information to the market place.

3 Set performance targets

Now that you have established your baseline performance, set firm improvement targets with milestones for action. Targets should relate to your organisation's sustainability goals and should be practical and achievable at a stretch. You may wish to articulate your commitments and targets in your organisation's sustainability policy (See Section 2.3: 'Developing a sustainability policy for your organisation'.)

When setting targets ask the following questions:

- How do your targets compare with those of your peers?
- Have you informed your internal and external stakeholders of the targets? Do they meet the stakeholders' current and future expectations?
- Can you verify progress in relation to the targets?

NABERS range of tools

NABERS provides a range of tools for benchmarking performance:

- **NABERS Energy** – available now for office and hotel buildings and shortly for retail properties. NABERS Energy was previously known as the Australian Building Greenhouse Rating (ABGR). Ratings are available for base buildings, tenancies and whole buildings.
- **NABERS Water** – available now for office and hotel buildings and shortly for retail. Ratings are available for whole buildings.
- **NABERS Waste** – available now for office buildings. Ratings are available for base buildings, tenancies and whole buildings.
- **NABERS Indoor Environment** – available now for office buildings.
- **NABERS Transport** – available shortly for office buildings.

Using your NABERS rating

You can use an accredited NABERS rating:

- as a marketing tool to attract tenants e.g. to satisfy government tenancy requirements
- to report building improvements in non-technical terms, e.g. 'We achieved a 1-star NABERS Energy improvement'
- to report performance in an internal or external sustainability report
- to participate in recognition programs e.g. CitySwitch Green Office (previously the 3CBDs Greenhouse Initiative), see www.cityswitch.net.au

www.nabers.com.au

Allocate responsibility for achieving the targets. Where applicable, integrate the targets and minimum standards into service or performance contracts with relevant service providers and staff performance agreements.

Make sure your targets are not numbers hidden in a report. Make them part of 'business as usual' operations. Promote targets to key stakeholders to ensure they understand the process you have committed to and the intended benefits.

4 Develop a sustainability action plan

Develop an action plan to improve your sustainability performance and achieve your targets. The action plan should identify responsibilities and timeframes for action.

Your plan should provide for:

- systematic implementation of initiatives
- monitoring actual performance against targets
- inspection, maintenance and cleaning schedules
- data collection and management
- reporting of outcomes.

Work out what measures need to be undertaken, and when. Assess each action against the business case to determine if the initiatives are:

- short-term opportunities, i.e. actions having a short payback period (typically less than 3 years) or yielding significant energy savings
- medium-term opportunities, i.e. actions having a payback period of 3 to 5 years, most likely involving changes in building maintenance and operational procedures
- long-term opportunities, i.e. actions having a payback period of 5 years or more, involving capital upgrades and refurbishments and therefore requiring budget allocations over a number of years.

Also identify whether the actions will require collaboration with tenants, e.g. refurbishment activities and fitouts.

Give priority to actions that will create long-term value by permanently reducing outgoings or achieving significant environmental savings such as lower greenhouse gas emissions.

Improvements that can be integrated into scheduled cyclic maintenance or capital upgrades may have a better chance of being implemented than one-off projects funded through operational budgets.

Setting your targets

Setting targets needs careful consideration:

- Targets should be quantifiable and measurable, rather than generic, e.g. 'reduce energy use by 15%' rather than 'save greenhouse gases'.
- Targets should require a stretch, but be achievable.
- Link targets to an indicator that reflects the level of activity within your organisation, e.g. base them on occupancy rates.
- Set the timeframe. Choose the base year and define the commitment period and completion date.
- Define the target boundaries.
- Set overall business targets, but also break down overall targets so they relate to specific business units, e.g. areas of intensive resource use.
- Involve end users and foster their sense of ownership.
- Assign specific accountabilities for delivering each target – to senior managers with appropriate levels of authority to control the process of achieving the target.
- Track and report on progress.
- Review targets periodically.

Adapted from *The Greenhouse Gas Protocol: A Corporate Accounting And Reporting Standard*, 2001, World Business Council For Sustainable Development and World Resources Institute

Focusing on energy, water, waste, indoor environment quality and refrigerants

Sections 3.5, 3.6, 3.7, 3.8 and 3.9 provide information about actions that can be undertaken to improve management of energy, water, waste, indoor environment and refrigerants.

Identify improvement initiatives

Once you have identified areas of poor performance, some opportunities for improvement will be readily actionable, and should be included in either maintenance programs or future upgrade or refurbishment projects.

To access the latest Australian research on improving the built environment, visit the Your Building portal at www.yourbuilding.org/display/yb/Home

5 Collect data and monitor performance

Put in place systems, or modify existing systems, for collecting accurate data for your sustainability indicators, including your target benchmarks. Existing building management and control systems (BMCS) may provide some data but are unlikely to provide all the data you'll require. You may need to set up or modify monitoring practices that involve electronic and other means of data collection.

When designing your monitoring system, make sure key tenants or resource intensive areas can be submetered, e.g. retail, food courts, fitness centres, carparks and HVAC equipment.

Evaluating your data

Make sure the data is not just being collected but is being used. Evaluate your building or portfolio against the selected NABERS rating or other benchmarks that are appropriate for your building. (Refer back to Step 2.) If you are submitting your building for an accredited rating you should work closely with your Accredited Assessor from the outset.

Remember to:

- check that you have the right documentation and data
- be aware of the timeframes required to get a rating
- after your first rating, make sure the correct data is collected as a matter of routine operation to ensure quicker, easier and cheaper subsequent ratings.

Set up processes where data is evaluated on a regular basis – preferably monthly. The problem with less frequent data analysis is that by the time you recognise a problem it might be too late to do some minor rectification works. Monthly monitoring also allows you to make subtle changes to the operation of the building and quickly determine if the results are as anticipated. Make sure there are targets for each measurement so you know if each one is where it should be.

www.yourbuilding.org

The Your Building web portal is a knowledge bank of information about ownership, design, construction, occupation and operation of sustainable commercial buildings.

The portal consolidates available knowledge on sustainable buildings and provides links to the websites of leading organisations and further web reference material. Through case studies and research findings it demonstrates the economic, environmental and social benefits of creating sustainable buildings, and provides up-to-date information on ratings systems and performance measurement.

The portal was created by the Cooperative Research Centre (CRC) for Construction Innovation in partnership with the Australian Sustainable Built Environment Council (ASBEC) and the Australian Government Department of the Environment, Water, Heritage and the Arts.

www.yourbuilding.org/display/yb/Home

Check your data

See the sidebar on page 6 of this section about checking your data and working out the best fit between collecting data and meeting people's data requirements.

6 Update building maintenance and operational procedures

Review building maintenance and operational procedures to make sure that sustainability measures are a routine part of everyday activities. Check that:

- poor equipment maintenance is not causing issues; for example, filters that are not cleaned regularly can increase energy consumption and create poor indoor environment
- standard building operating procedures are not causing problems in other areas; for example, closing outside air dampers slightly may improve energy consumption in some circumstances but may also contribute to poor indoor environment
- sensors are calibrated so systems are working as designed
- control loops are fine-tuned for seasonal variations
- temperature set points are suitable for efficient operation and tenant comfort
- tenant complaints are dealt with in a timely manner and the basic cause of the issue is dealt with, rather than making a small area acceptable and possibly causing problems in other areas.

7 Integrate sustainability into contracts

Review major contracts to identify potential rewards for sustainability initiatives. Build sustainability requirements into other contracts such as maintenance, controls and subcontractors working on site. Make sustainability a key performance indicator for maintenance and controls contracts. This must be measurable and deliverable.

Check your purchasing contracts to make sure sustainability is a key factor in product and supplier selection. Refer to Section 5: 'Sustainability and the Supply Chain'.

8 Report performance monthly

Build sustainability management into regular base building reporting. Ensure monthly reporting tracks performance against sustainability targets. Investigate variations or unusual events. Include performance monitoring results in your monthly property sustainability report. You could use Worksheet 3.4C: 'Monthly property sustainability report' as a guide, or adapt this to integrate it into your existing monthly reports.

At team meetings discuss monthly performance and the measures taken to maintain or adjust building services so they make the best contribution to meeting your targets.

Check your data

Make sure the data you collect:

- is accurate and can be reported monthly at least
- can be verified – especially if third party verification is required
- can be used for external benchmarking – check with the NABERS website or your Accredited Assessor to make sure your data is useful for evaluating and achieving your NABERS targets.

Work out the best fit

Work out the best fit between the demands imposed by collecting and verifying data and the expectations of the people requiring the information. BMCS vary in complexity and usefulness. They are often under-used or not well understood, and information obtained rarely reaches property owners, let alone tenants.

Sophisticated diagnostic or 'real time' monitoring and reporting systems that can report inefficiencies in building services and prompt management responses are becoming increasingly available.

9 Engage tenants

Regularly engage with your tenants to support them in improving their own sustainability, and keep tenants up-to-date on the performance improvements you are working on. Make them a part of the process and let them know how you are improving their building. Encourage tenant's staff and key contractors to improve their sustainability as well, by working through a similar process to the one you are undertaking. See Section 5: 'Sustainability and the Supply Chain'.

Engage tenants on projects that will help to improve the overall performance of the building. Encourage them to rate their own tenancy performance by obtaining a NABERS tenancy rating. Help them to improve their tenancy ratings. See Section 3.3: 'Tenant engagement and green leases'.

10 Review performance annually

Undertake an annual performance review to track your property sustainability trends. You could use Worksheet 3.4D: 'Annual resource efficiency review' as a guide. Review your sustainability trends and ask yourself:

- How have you progressed against your targets?
- What can you do over the next 12 months to improve performance?

Public reporting of your performance is the key to ensuring accountability and a positive corporate reputation amongst your stakeholders. Your annual review and report should include official, accredited NABERS ratings. This gives stakeholders confidence that the reported standards are reliable, and that you are committed to achieving the targets you have established. Update your sustainability action plan once you have completed your review.

Tenants' sustainability initiatives

Areas to work on with tenants include:

- turning computers, office equipment and lights off when not in use
- reducing waste generation and optimising opportunities for recycling
- using sustainability as a major criteria when purchasing equipment
- encouraging tenants to make sustainable material choices in their fitouts, such as specifying low-VOC paints.

For more information about working with tenants on sustainability see Sections 3.3: 'Tenant engagement and green leases' and 4.3: 'Sustainable fitouts'.

Further information

- National Australian Built Environment Rating System (NABERS), www.nabers.com.au
- Green Building Council of Australia (GBCA), Green Star rating scheme, www.gbca.org.au
- CitySwitch Green Office (previously the 3CBDs Greenhouse Initiative), see www.cityswitch.net.au
- Your Building portal: www.yourbuilding.org/display/yb/Home
- Property Council of Australia, www.propertyoz.com.au
- Australian Performance-based Building Network, www.auspebbu.org

Worksheets

Review and use these Word and Excel files:

3.4A Property sustainability data template

3.4B Portfolio sustainability data template

3.4C Monthly property sustainability report *(Excel)*

3.4D Annual resource efficiency review

Worksheet 3.4A

Property sustainability data template

The following template can help you develop a baseline for your building and should be undertaken with the help of a technical specialist. This worksheet includes both office space and retail space. This is an example only – adapt this worksheet to suit your organisation's requirements, and delete sections not relevant to the property under review.

Section A: Property details

Building/Centre name		City	
Street address			
Building age			

Size:		Building functions:	
No. of levels (excluding basement)		Office space	m^2
Gross floor area	m^2	Retail	m^2
Building net lettable area (NLA) incl. vacancies	m^2	Food outlets	m^2
No. of car parking levels (or area in $m^{2)}$		Carpark	m^2
Basement size	m^2	Other (list)	m^2
No. of car parking spaces			m^2
No, of disabled parking spaces			
No. of lifts, escalators and travelators			

Office tenancy			**Occupancy/use**	
Major tenants	% NLA occupied	No. staff	Total no. building occupants (excl. visitors and building contractors)	
			Standard weekly hours of operation	
			No. of floors with 24/7 operation	
			% vacancy (at time of assessment)	
No. of tenancies:				

Retail capacity			**Occupancy/visitation**	
	Number	GLAR	Hours of annual occupancy	
Specialty tenants			Annual total visitation	
Major tenants			Peak visitation (people/day)	
No. of tenancies			Standard weekly hours of operation	
% vacancy (at time of assessment)			No. of levels with 24/7 operation	

Industry benchmarks				
NABERS Rating	Base	Tenancy	PCA Office Quality Grade	
NABERS Energy			Green Star Rating (specify tool used)	
NABERS Water		n.a.		

NABERS Waste				

Building management	
Are 'green leases' used for tenancies?	
Is there an Environmental Management Plan in place for the building, and in use?	
Does the Building Fitout Guide include green clauses and standards?	
Does the Building Users Guide include good environmental practice?	
Is there a Building Environmental Management Committee in place? Meeting regularly?	

Transport and accessibility

Distance from bus stop	m	Disabled toilets on each occupied floor	Y/N
Distance from train station	m	Estimated workforce using public transport	%
Distance from public carpark	m	No. designated motor bike spaces provided	
Disabled access from street to lift lobby	Y/N	No. designated bicycle spaces provided	
Disabled access from carpark to lift lobby	Y/N	No. shower facilities for cyclists	

List specific facilities for disabled accessibility (e.g. lifts, toilets etc.):

Notes regarding source and quality of information and data included in this evaluation:

Section B: Property performance

Note: per m^2 means per square metre of NLA

Energy

Note: In WA, SA and QLD include information on energy resold.

20XX/20XY energy consumption			
	Units	**20XX**	**20XY**
Total electricity consumption base building house light and power	kWh		
	kWh/m^2		
	MJ/m^2		
Basement light and power (if known)	kWh		
	kWh/m^2		
	MJ/m^2		
Total gas consumption	MJ		
	MJ/m^2		
Lift electricity consumption (if known)	kWh		
	kWh/m^2		
HVAC electricity consumption (if known)	kWh		
	kWh/m^2		
After hours HVAC electricity (if known)	kWh		
	kWh/m^2		
Total heating (if known)	MJ		
Total hot water (if known)	MJ		
Total other fuels used on site e.g. diesel	Lt		

20XX/20XY energy costs			
	Units	**20XX**	**20XY**
Total electricity supply cost base building house light and power	$		
	$ /m^2		
Total gas supply cost	$		
	$ /m^2		
Total other fuels supply costs	$		
	$ /m^2		

Comment on any aspect of energy consumption and cost of energy supply.

Monthly performance (base building)	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**
Electricity consumption (KWh)												
Peak demand (KW)												
Electricity costs (total $)												
Gas consumption (MJ)												
Gas costs (total $)												

Is there an Energy Management Plan (or similar) in place? If so, include a copy with this evaluation.	

Briefly describe the HVAC system and its key components including any energy saving features.	Number	Type	Capacity	Age
• boiler plant				
• chiller plant				
• cooling towers				

• air handling systems				
• water reticulation systems				
• air filtration systems				
What are the outside air flow rates (L/s)				
How many occupants is the air conditioning serving?				
Does the air handling plant have high efficiency filtration?				
Are air filters regularly inspected and changed?				
Are there any supplementary AC systems? If so, describe capacity and use.				
Are there shut-off valves on condenser water supply (tenant)?				
Describe the carpark/basement ventilation system.				
Is carbon monoxide monitoring provided?				
Describe the domestic hot water systems installed in the building.				
Briefly describe the scope of the A/C control systems:				
• type (e.g. pneumatic, electronic, DDC)				
• control of HVAC systems				
• economy cycles				
• night purge				
Is power factor correction installed in the building? If so, provide details.				
List scope of energy submetering systems i.e.:				
• house power				
• lifts				
• mechanical				
• carpark				
• gas				
Are these monitored on a monthly basis? Provide reports if available.				
Is the building exposed to significant western sun?				

Is there sun shading on exterior windows or internal blinds?	
Briefly describe the lighting system including energy saving features:	
• tenant controls	
• lighting controls	
• types of luminares	
• lighting zones (size in m^2/number/ floor)	
• dimming systems	
• after-hours controls	
Do cleaners turn off the lights at night?	
Has an energy audit been undertaken in the last 5 years? If so, provide copy.	
Add any comments on energy information provided.	

Greenhouse emissions, ozone depletion and global warming

	Units	20XX	20XY	
Total GHG emissions	kg $CO_{2\text{-}e}/m^2$			
Quantity of each refrigerant type used in A/C (if desirable attach a refrigerant register including quantity stored on premises):				
Is a refrigerant leak detection system installed?				
What is the limit of detection (e.g. < 100 ppm)?				
Does the system monitor the refrigerant stockpile?				

Water and Wastewater

	Units	20XX	20XY		Units	20XX	20XY
Total water consumption (mains supply)	kL			Cost of mains water	Total $		
	kL/m^2				$/kL		
Total water consumption (other supply e.g. rainwater collection)	kL			Cost of effluent discharge	$		
					$/$m^2$		
Water recycled	kL						

Quarterly performance	(20XX) July to Sept	Oct to Dec	Jan to March	April to June
Consumption (kL)				
Supply costs				

Toilets			**Urinals**		
Flush volume	**No. of women's**	**No. of men's**	**Type**	**No.**	**Flush volume**
6/3 L dual flush			Timed flush		
9/4.5 L dual flush			Manual flush		
6 L full flush			Sensor-operated flush		
9 L full flush			Waterless		
11 L full flush			Other		

Showers		**Basins in amenities**		
No.	Flow rate (L/min)	No.	Tap type	Tap flow rate (L/min)

Storage tanks			**Cooling towers** **No. of towers:**			
Capacity (kL)	No.	Location/use	Type	Cycles of concentration	Refrigeration capacity (kWh)	Operating times

NABERS Water rating (if assessed)	Rating:
	kL/m^2/pa:
Has a water audit been undertaken in the last 5 years? If so, provide a copy.	
Are submeters installed to monitor major water consuming equipment? If so, provide a breakdown of % of total water use for each metered component.	
Are these submeters connected to a stand-alone system for monitoring?	
Is there an irrigation system installed? If so, specify time/week, minutes/session and flow rate.	
Are water devices such as ball floats in cooling towers and make-up tanks checked and maintained on a regular basis?	
For cooling towers, is water make up metered?	
Is bleed-off from cooling towers also metered?	
Have any water leaks been identified and fixed in the past year. If so, specify.	
List any water-saving devices used in the building (e.g. flow restrictors, low-flow shower heads, automatic taps etc.)	
Is there a system in place where water can be recovered for reuse?	

Is stormwater or rainwater collected and stored for use on site? If so, describe storage capacity and use.	

Waste

	Unit	20XX	20XY		Unit	20XX	20XY
Total solid waste sent to landfill	T			Annual cost of waste collection sent to landfill (collection, transport and tip fees)	$		
					$/m^2		
Total paper and cardboard waste collected for recycling	T			Annual cost of paper and cardboard collection and removal	$		
					$/m^2		
Total other recyclables (e.g. co-mingled containers)				Annual cost of other recyclables collection and removal	$		
					$/m^2		

NABERS Waste rating (if assessed)	Rating:
	g/person/pa (if applicable):
	% recycled:
Is there a Waste Management Plan in place (or similar), e.g. waste minimisation strategy, to reduce waste going to landfill (e.g. increase recycling)? If so, provide a copy.	
Has a waste audit been undertaken in the last 5 years? If so, provide a copy.	
Describe the waste recycling system in major tenancies e.g. plastics, paper & cardboard, organics etc.	
Describe the waste recycling systems or infrastructure (e.g. compactors) for the base building e.g. plastics, paper & cardboard, organics etc.	
Describe any additional waste recycling or collection systems provided for other materials e.g. fluorescent tubes, batteries, mobile phones, construction & demolition waste, furniture, electrical equipment etc.	
Are there any planned or desired improvements to waste management to reduce waste to landfill? If so, describe.	

Indoor Environment

	Unit	20XX	20XY		Unit	20XX	20XY

NABERS Indoor Environment rating (if assessed)	Rating:
Is there an Indoor Environment Management Plan in place (or similar), If so, provide a copy.	

Has an IE audit been undertaken? If so, provide a copy.	
Describe the IE systems or infrastructure	
Describe any additional IE initiatives	
Are there any planned or desired improvements to IE management? If so, describe.	
Have air quality tests been undertaken? If so, what actions have been implemented to improve indoor air quality?	

OH&S/access	**20XX**	**20XY**
Total reported incidents		
Successful compensation claims against building owner or managing agent		

Have risk management procedures been implemented on this property?	
Are contractor management procedures in place?	

Disabled access	Compliant	Non-compliant
Points of entry:		
• main		
• rear		
• side		
Emergency exits		
Toilets		
Foyer		
Upper levels		
Lifts		

Lease characteristics

List number of leases per type:	Gross	Semi-gross	Net

Are all major tenants on net or gross leases?	
Lease expiry profile (provide if available)	

Contractors and suppliers

Are contractors and suppliers screened for competency regarding sustainability e.g. environmental experience, environmentally friendlier products, ISO 14001 system in place, waste avoidance, low-emission products, staff training etc. If so, describe.	

Refurbishment history

When was the building last upgraded or refurbished? List key improvements. (building services, façade, common areas etc.)	

Describe any upgrades planned and or budgeted for? e.g. BMS, chillers, cooling towers, air handling units, lighting systems, floor refurbishments, make good, switchboards etc.	
What failures in building services have occurred in the past 2 years? Describe incidents and likelihood of re-occurrence.	

Worksheet 3.4B Portfolio sustainability data template (A3 page size)

Fund/portfolio name:

Period of assessment: 20XX – 20XY *(Financial year)*

Use this spreadsheet to aggregate data across a fund or portfolio so you can identify baseline performances over various sustainability criteria. Data may be collected using Worksheet 3.4A: 'Property sustainability data template'. This is an example only – adapt this worksheet to suit your organisation's requirements.

Property information	**Building number (for this assessment)**	**Example**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	Name and address of each property	Example office building								
	State	NSW								
	Age (years)	18								
	NLA (m^2)	19,917								
	Basement (m^2)	5,500								
	No. Occupants (average over period)	905								
	Average occupant density (based on 1 person/15m^2 NLA)	1,328								
	Managing Agent	Name								
Electricity Offices (NLA)	Total annual electricity consumption in offices (kWh)	2,054,976								
	Total annual electricity consumption in offices (MJ)	7,397,914								
	Total annual electricity supply cost ($)	211,178								
	Electricity efficiency (MJ/m^2/year)	371.44								
	Fund/portfolio average (MJ/m^2/year)	404.00								
	Electricity annual total supply cost ($/$m^2$/year)	10.60								
	Fund/portfolio average cost/m^2 ($/$m^2$/year)	0.00								
	Property Council of Australia (PCA) lower quartile ($/$m^2$/year)	9.53								
	PCA median ($/m2/year)	11.57								
	PCA upper quartile ($/m2/year)	13.76								
	Electricity (MJ/person/year)	8,174.49								
	Comparison fund/portfolio average (MJ/person/year)	0.00								
	Electricity ($/person/year)	233.35								
	Comparison fund/portfolio average ($/person/year)	0.00								
Carpark & basement	Total electricity consumption (if metered) (kWh)	42,500								
	Total electricity consumption (if metered) (MJ)	153,000								
	Total electricity supply cost (if known) ($)	49,950								
	Electricity efficiency (MJ/m^2/year)	27.82								

	Electricity cost ($/m^2/year)	9.08								
Combined offices, carpark & basement	Total electricity consumption (kWh)	2,097,476								
	Total electricity consumption (MJ)	7,550,914								
	Total electricity cost ($)	261,128								
	Total electricity consumption efficiency (MJ/m^2/year)	399								
	Total electricity cost efficiency($/m^2/year)	19.68								
	Total electricity efficiency per person (MJ/person/year)	8,174.49								
	Total electricity cost per person ($/person/year)	233.35								
Electricity generation on site	Total generation capacity (kWh)									
	Percentage of total annual electricity consumption (%)	2								

Gas Offices	Total gas consumption (MJ)	4,739,995								
	Total gas cost ($)	41,025								
	Gas use efficiency (MJ/m^2/year)	238								
	Fund/portfolio average energy efficiency (MJ/m^2/year)									
	Gas supply cost efficiency ($/m^2/year)	2.06								
	Fund/portfolio average cost efficiency $/m^2/year									
	Gas use per person (MJ/person/year)	5,237.56								
	Comparison fund/portfolio average (MJ/person/year)									
	Gas cost per person ($/person/year)	45.33								
	Comparison fund/portfolio average ($/person/year)									

Total energy for the building	Total energy (MJ)	12,290,909								
	Total energy cost ($)	302,153								
	Total energy (MJ/m^2/year)	483.57								
	Total energy cost efficiency ($/m^2/year)	11.89								
	Total energy cost per person ($/person/year)	333.87								
	Total energy efficiency per person (MJ/person/year)	13,581								
	Comparison fund/Portfolio A average cost efficiency ($/m^2/year)									
	Comparison fund/Portfolio A average consumption efficiency (MJ/m^2/year)									
	Other benchmark									

Greenhouse emissions	NABERS Energy rating (no. stars)	2.5								
	NABERS Energy statistical average for fund/portfolio (no. stars)	0.00								
	Total CO_2 emissions (uncorrected for use) (kg CO_2/year)									
	Total emissions normalised (kg CO_2/m^2)									
	Comparison fund/Portfolio A normalised emissions (kg CO_2/m^2)									
	Comparison fund/Portfolio B normalised emissions (kg CO_2/m^2)									

Water	Average purchase price/kL from utility ($)	0.52								
	Total water consumption (kL)	14,077								
	Total water cost ($)	7,376								
	Total water efficiency (kL/m^2/year)	0.71								
	Total water cost efficiency ($/m^2/year)	0.37								
	Total water utilisation per person (kL/person/year)	15.55								
	Total water cost efficiency per person ($/person/year)	8.15								
	Fund/portfolio average water efficiency (kL/m^2/year)									
	Fund/portfolio average water efficiency per person (kL/person/year)									
	Fund/Portfolio average water cost ($/m^2/year)									
	Comparison fund/Portfolio A average efficiency (kL/m^2/year)									
	Average water consumption (Sydney Water) (kL/m^2/year)	1.13								
	Best practice water consumption (Sydney Water) (kL/m^2/year)	0.50								
	Other benchmark									

Waste Waste collected (W) for landfill (annual)	Total waste collected (kg/year)	127,500								
	Total waste collected (kg/m^2/year)	6.40								
	Waste collected per person (kg/person/year)	140.88								
	Fund/portfolio average (kg/m^2/year)									
	DECC benchmark: Average 7.8 kg/m^2/year	7.8								
	DECC Average 173 kg/person/year	173								
Waste collected for recycling (R)	Total waste recycled (kg/year)	47,491								
	Waste recycled (kg/m^2/year)	2.38								
	Waste recycled per person (kg/person/year)	52.48								
	Fund/portfolio average (kg/m^2/year)									
	Fund/portfolio average per person (kg/person/year)									
	Other benchmark									
Total waste collected & recycled	Total waste collected for recycling and landfill (kg/year)	174,991								
	Total waste collected & recycled (kg/m^2/year)	8.79								
	Total waste collected & recycled (kg/person/year)	193.36								
	Fund/portfolio average total waste collected & recycled (kg/m^2/year)									
	Fund/portfolio average total waste collected & recycled (kg/person/year)									
	Other benchmark									
Recycling ratio	% recycled	37								
	Fund/portfolio average recycling rate (% recycled)									
	Other benchmark									

Transport	Distance to bus stop (m)	100								
	Distance to train station (m)	1,000								
	Distance to train station (km)	1								
	Distance to public carpark (m)	100								
	Number of bicycle spaces provided	32								
	Fund/portfolio average number of bicycle spaces provided	0.00								
	Ratio of bicycle spaces to occupants (%)									
	Fund/portfolio average of bicycle spaces to occupants (%)									
	Green Star goal for bicycle spaces: occupants (%)	5								
	Number of showers provided	3								
	Ratio of showers to bicycle spaces (%)	10								
	Fund/portfolio average of showers to bicycle spaces (%)	0								
	Green Star goal for showers: bicycle spaces (%)	10								

Industry benchmarks	NABERS Water	2								
	NABERS – Fund/portfolio average	3.2								
	Green Star rating if appropriate									

Key

	Calculations made by assessor using data provided by owner
N/A	Data not available (i.e. response made on data sheet, e.g. Not available)
Blank	Data not provided (i.e. blank on data sheet)
Unknown	Data is unknown

Worksheet 3.4C

Monthly property sustainability report

The following information could be reported to building owners on at least a monthly basis for base building reporting.
Format and frequency should be determined by the property owner or fund manager.
This is an example only -- adapt this worksheet to suit your organisation's requirements.

Property performance for the period: _____

Criteria	Scope		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Annual
Occupancy	Total occupation (% of max.)	Target													
		Actual													
		Difference													
Energy efficiency	Electricity consumption (kWh)	Target													
		Actual													
		Difference													
	Gas consumption (MJ)	Target													
		Actual													
		Difference													
	Energy supply costs ($)	Target													
		Actual													
		Difference													
Water & wastewater	Mains water supply (total kL)	Target													
		Actual													
		Difference													
	Total wastewater recycled or reused (kL)	Target													
		Actual													
		Difference													
	Total rain water harvested (kL)	Target													
		Actual													
		Difference													
	Water supply costs ($)	Target													
		Actual													
		Difference													

Criteria	Scope		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Annual
Waste minimisation	Recycled materials (e.g. office paper, co-mingled containers)	Target													
		Actual													
		Difference													
	Wet organic waste (retail) (kg)	Target													
		Actual													
		Difference													
	Residual waste to landfill (kg)	Target													
		Actual													
		Difference													
	Waste removal costs (recycling and residual)	Target													
		Actual													
		Difference													
Refrigerants	Total stored on site (kg)	Target													
		Actual													
		Difference													
	Total ‘lost’ during period (kg)	Target													
		Actual													
		Difference													
Indoor environment and tenant relations (measured by number of tenant complaints)	Thermal comfort (complaints)	Target													
		Actual													
		Difference													
	Noise (complaints)	Target													
		Actual													
		Difference													
	Indoor environment e.g. odours (complaints)	Target													
		Actual													
		Difference													
	Lighting (complaints)	Target													
		Actual													
		Difference													
	Other (complaints)	Target													
		Actual													
		Difference													
	Other (complaints)	Target													
		Actual													

Criteria	Scope		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Annual
		Difference													
	IAQ monitoring costs ($)	Target													
		Actual													
		Difference													
	IAQ monitoring	Target													
	Test Results	Actual													
		Difference													
OH&S[1]	Reported incidents	Target													
		Actual													
		Difference													
	Medical treatment cases	Target													
		Actual													
		Difference													

[1] OH&S performance could be a separate report, but inclusion in a regular sustainability report is recommended.

Worksheet 3.4 D

Annual resource efficiency review

This is an example only – adapt this worksheet to suit your organisation's requirements.

Building/Centre name			
Street address			
Building age			
Size & tenancy		**Building functions**	
Gross floor area	m^2	Office space	m^2
Net lettable area / GLAR	m^2	Retail	m^2
No. of levels (excl. basement)	m^2	Food outlets	m^2
Basement levels	m^2	Carpark	m^2
Average annual vacancy level	%	Other (list)	m^2

	Previous year: 200X		**Current year: 200X**		**Next year**
Resource use	*Target*	*Actual*	*Target*	*Actual*	*Target*
Energy/GHG emissions					
Total electricity (kWh)					
Total gas (MJ)					
Total cost of energy supply ($)					
Total cost of energy supply ($/$m^2$NLA)					
NABERS Energy rating					
Water					
Total water consumption (kL)					
Utilisation (kL/m^2NLA)					
Total wastewater recycled (kL)					
Total cost of water supply ($)					
Total cost of water supply ($/$m^2$NLA)					
NABERS Water rating					
Waste and recycling					
Total solid waste sent to landfill (T)					
Total annual cost of residual waste collection and removal (collection, transport and tip fees) ($)					
Annual residual waste cost efficiency ($/$m^2$NLA)					

	Previous year: 200X		Current year: 200X		Next year
Resource use	*Target*	*Actual*	*Target*	*Actual*	*Target*
Total paper and cardboard waste collected for recycling (T)					
Total other waste collected for recycling (plastics/organics etc.) (T)					
Annual cost of recycling collection ($)					
Annual recycling cost efficiency ($/m^{2}NLA)					
Annual cost of all waste ($)					
Annual waste cost efficiency ($/m2NLA)					
Other waste, i.e. electronic equipment waste (e-waste)					
NABERS Waste rating					
Indoor environment and tenant relations					
Tenant thermal comfort complaints					
Tenant noise complaints					
Tenant indoor environment complaints					
Air quality test results					
Tenant lighting complaints					
Other tenant complaints					
Total costs directly from tenant complaints ($)					
Total cost to rectify tenant complaints ($/m^{2}NLA)					
NABERS Indoor Environment rating					

Sustainability improvements for the period (planned and underway)

Area	Activity	Outcomes sought	Finish date
Greenhouse and energy efficiency	e.g. progress with Energy Management Plan; M&E upgrades, lighting controls, HVAC efficiency upgrades, energy monitoring, risk to NABERS Energy rating, energy advice provided to tenants	Expected benefits in energy savings, GHG reduction, cost savings, NABERS Energy rating	
Water and wastewater	e.g. hydraulic system efficiency upgrades, leakage containment, urinal sensors, usage monitoring, wastewater reuse	Expected benefits in water consumption and cost savings	

Area	Activity	Outcomes sought	Finish date
Waste minimisation	e.g. recycling initiatives, performance monitoring or audits, contamination rate improvements, recycling advice to tenants	Reduced property waste to landfill	
Indoor environment quality	e.g. audit results and recommendations, filtration, noise levels, thermal comfort, tenant complaints or requests	Meet or improve on acceptable levels, reduce or eliminate risks to adverse air quality, support workplace productivity	
Pollution minimisation	e.g. hazardous materials management, refrigerant leakage, trade waste compliance, stormwater run-off, carpark exhaust etc.	Reduce or eliminate pollutants, reduce liability risks	
OH&S	e.g. audit results and recommendations, incident investigations closed, contractor safety training	Reduced scope and severity of OH&S incidents, safer workplace	
Other	e.g. general sustainability assessments or surveys, bicycle parking, showers, tenant surveys, tenant advisory services, supply chain management, procurement contracts etc.	Trend improvements where possible and practical	

Performance analysis

Explain any significant variation from annual targets.	
List impacts of key building services maintenance activities during the year on energy and water efficiency.	
List the impacts of any building upgrade activity during the year on energy and water efficiency.	
Has an Energy, Water, Waste Recycling, or Indoor Environment Management Plan been implemented during the year? If so, describe major activity.	
Have any resource efficiency audits or similar been undertaken during the year? List key outcomes and recommendations.	
List any relevant outcomes of stakeholder partnering activities/projects during the year on resource efficiency (e.g. Greenhouse Challenge, CitySwitch, NABERS Energy Commitment Agreement, Sustainability Covenants etc.)	
Recommendations on next financial year actions required to improve resource efficiency outcomes:	

Person completing the review:	Contact details:
Name	Phone
Position	Mobile
Date of review:	Email

Managing energy

3.5

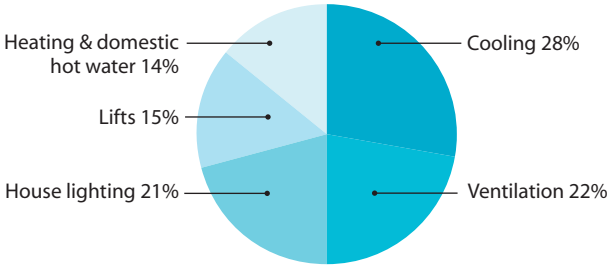
Context

More than 600 Australian office buildings have been assessed for their NABERS Energy rating. This figure demonstrates the increasing attention being focused on energy performance in the office property sector. NABERS Energy and Water ratings are also available for hotels. The retail sector is also achieving savings through energy efficiency and will soon able to benchmark its performance using NABERS in a similar manner to the office sector.

Buildings that have incorporated NABERS into their energy management plans, and have demonstrated this by rating their buildings more than once, have shown an average improvement of 0.5 star, equating to average savings of 10% on greenhouse gas emissions plus the associated energy and its costs. This is a strong incentive to improve your property energy performance and incorporate benchmarking in the process.

Typical energy consumption of commercial properties, base building

Source: www.nabers.com.au



What's in this section

Steps: Managing energy

1 Measure baseline performance

Identify the current energy performance of your building or portfolio. Section 3.4 explains how to do this as part of assessing your property's overall sustainability performance, and Worksheet 3.4A will help you to compile data detailing annual energy usage, including:

- total energy consumption – electricity, gas and other fuels (e.g. diesel) plus comparisons to the previous year
- energy consumption in high energy intensive equipment or activities (e.g. HVAC equipment, lifts) or during peak demand and after-hours use
- details of metering or controls in place to help manage energy (e.g. tenant submeters or lighting controls)
- your NABERS Energy rating.

Worksheet 3.4C is a template for summarising monthly performance data.

It's likely that the process of assessing your energy baseline will reveal gaps in your data, e.g. tenant energy use being included in base building consumption. Barriers to improving and reporting on energy may also become more evident, e.g. metering or the need for equipment upgrades. These discoveries can form the basis of your energy action plan (Step 4 below).

2 Benchmark performance

An important aspect of assessing your baseline performance is benchmarking the building's energy use and greenhouse emissions compared to others in the market, giving you a good indication of relative performance. To benchmark your building, use the NABERS Energy rating system. (NABERS for retail properties will be available later in 2009.)

When your building or portfolio is rated against the benchmarks, you need to ask:

- How does your building or portfolio compare?
- What percentage of your portfolio is below or above average?
- Is this acceptable for the market positioning of your building or portfolio?
- What are the ramifications for obtaining and retaining environmentally aware tenants?
- What are the ramifications for the value of your asset?

Use the benchmarks to set improvement targets and to identify and prioritise properties that may need immediate action. See Section 3.4 for more information about benchmarking using NABERS.

Self assessment

You can self-assess building environmental performance at no cost using the NABERS performance rating calculator (see www.nabers.com.au). The calculator is applicable to base buildings, tenancies and whole buildings.

About NABERS

NABERS is the National Australian Built Environment Rating System managed by the Department of Environment and Climate Change NSW. NABERS is a performance-based rating system which measures the operational environmental impacts of existing buildings.

NABERS office tools can be applied to three distinct situations:

- **Tenancy** ratings that cover the space occupied by a single tenant and under the control of that tenant
- **Base Building** ratings that cover all office spaces for that building, and measure the parameters that are under the control of the landlord or base building
- **Whole Building** ratings that are a combination of both Tenancy and Base Building for the situation where a tenant is the owner and/or has control of all services.

For more information see www.nabers.com.au

Self-assessment can give you a rough idea of performance, but you need to be careful that the information you enter is as accurate as possible and conforms to the data needed by the calculators.

For example, if you're using the base building energy calculator, the area should be based on the net lettable area (NLA) minus spaces that can be excluded (e.g. retail areas in an office building) and the energy usage data needs to relate only to the part of the building being rated, e.g. the base building. If the information you enter is not accurate (e.g. using the number of computers on the asset register instead of the number of frequently used computers) the results can be misleading. If you are uncertain about self-assessment look for further information on the NABERS website or seek advice from a NABERS Accredited Assessor.

Accredited assessment

To ensure the accuracy of the results you obtain, and to use the rating to promote your property or organisation, or to use the NABERS trademarks, you must obtain a certified rating from a NABERS Accredited Assessor. Make sure you use an assessor with good knowledge of energy efficiency and sustainability practices in both commercial property design and management. A list of assessors is available at www.nabers.com.au. An Accredited Assessor can also give you general advice or help you with an unofficial self-assessment.

3 Set performance targets

Now that you have established your baseline performance, set firm improvement targets with milestones for action. Energy targets should relate to your organisation's sustainability goals and should be practical and achievable at a stretch. You may wish to articulate your energy commitments and targets in your organisation's sustainability policy (See Section 2.3: 'Developing a sustainability policy for your organisation'.)

When setting targets ask the following questions:

- How do your targets compare with your peers in the market?
- Have you informed your internal and external stakeholders of the targets? Do the targets meet the stakeholders' current and future expectations?
- Can you verify progress in relation to the targets?

Allocate responsibility for achieving the targets. Where applicable, integrate the targets and minimum standards into service or performance contracts with relevant service providers and staff performance agreements.

Energy hungry empty buildings

'Analysis of smart metering data from 39 Martin Place Sydney confirmed that HVAC operating hours during weekdays and weekends did not necessarily match occupancy times. Energy consumption for the periods before occupancy on weekdays and weekends was excessive.

The building managers worked out they could reduce operational energy consumption by adjusting operating schedules and control strategies. The most noticeable change was reducing overnight base load from 400 kW to 75 kW. There were further opportunities too, e.g. revising control strategies to reduce energy consumption during after-hours and weekend operations. The operating load during start-up changed from 437 kW to 261 kW.

Estimated annual savings calculated from the smart metering data:

- Total savings: $9,660
- Total reduction in usage: 120,750 kWh
- Total reduction in emissions: 113,505 kg/$Co_{2\text{-}e}$'

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Energy target examples

Example base building energy performance targets include:

- increasing the building's NABERS Energy rating by 1 star within a 12-month timeframe (be sure to set a specific date)
- reducing the building's energy intensity (kWh/m^2) by 25% within 18 months
- having metering installed for all energy intensive activities within 6 months.

Portfolio targets might include:

- achieving an average 4.5-star NABERS Energy rating across the portfolio by a specific date
- reducing portfolio energy use by 15% by a specific date
- purchasing XX% of electricity from accredited GreenPower sources across the entire portfolio.

Make sure your targets are not numbers hidden in a report. Make them part of 'business as usual' operations. Promote targets to key stakeholders and ensure they understand the process you have committed to and the intended benefits.

4 Develop an energy action plan

Develop an action plan to improve energy performance and achieve your targets. The plan should identify responsibilities and timeframes for action. You could use Worksheet 3.5A as a guide. Work out what measures need to be undertaken, and when. Assess each action against the business case to determine if the initiatives are:

- short-term opportunities, i.e. actions having a short payback period (typically less than 3 years) or yielding significant energy savings
- medium-term opportunities, i.e. actions having a payback period of 3 to 5 years, most likely involving changes in building maintenance and operation procedures such as cleaners turning off lights or changing building management system settings, or
- long-term opportunities, i.e. actions having a payback period of 5 years or more, involving capital upgrades and retrofits and therefore requiring budget allocations over a number of years.

Also identify whether the actions will require collaboration with tenants, such as refurbishment activities and fitouts.

Identify energy improvement initiatives

Once you have identified areas of poor performance, some easy wins will be readily actionable, and should be included in either maintenance programs, reviews of operational procedures or future upgrade or refurbishment projects. Others may simply require a behavioural change by staff, such as turning off lights in areas not being used. Some common energy efficiency measures are listed below.

You could use the energy checklist provided in Worksheet 3.5B to start identifying improvement steps. This checklist is structured around base building equipment and management processes that are major energy consumers:

- lighting
- heating, ventilation and air conditioning
- domestic hot water
- metering, tariffs and billing.

The checklist should be read and used in conjunction with AS 3598:2000 *Energy Audits*, including the data recording templates and audit procedures provided in this Standard.

Smart thermostat trial

'People tend to dress for the seasons and the weather. However, air conditioning within office buildings is typically set to provide a 21.5 + 1°C temperature range, regardless of outdoor conditions. This is not only a waste of energy, but reduces relative comfort for building occupants.

Over the 2006/07 summer period, Investa collaborated with CSIRO and Sustainability Victoria to study how temperature variance could be managed better to improve tenant comfort and save energy.

Experiments were performed in one of Investa's commercial buildings in Melbourne. CSIRO implemented new software for the air conditioning control system that, depending on the outside temperature, made slight changes to the thermostat setting. The effects of these changes on the electricity consumption were calculated through data analysis from power meters fitted to the HVAC system.

The results of the experiments showed that it is feasible to reduce electricity consumption by up to 15% on a hot summer's day through intelligent control of the building's thermostats.

The power savings recorded on the trial were much better than the initial modelling predicted. Plans are now underway to implement these strategies across Investa's commercial property portfolio, multiplying the value of this trial.'

Investa Property Group, www.investa.com.au

Key actions might include undertaking energy audits and detailed technical reviews. See *Your Building* for further information on energy opportunities: www.yourbuilding.org/display/yb/Home

Although a performance review involving target setting could be an annual event, it may be desirable to undertake energy audits at least every 5 years, or when major unplanned changes in energy performance occur. Audits at this frequency should be to at least a Level 2 scope as set out in AS 3598:2000 *Energy Audits*. The report from a Level 2 audit often forms the justification for substantial investment or an energy performance contract, so detailed economic analysis with an appropriate level of accuracy is required.

5 Collect data and monitor performance

Review existing energy monitoring and data management capabilities, including the building management and control system. What improvements are required so that accurate data can be collected and reported at least monthly? When designing your monitoring system make sure key tenants or energy intensive areas can be submetered (e.g. retail, food courts, fitness centres, carparks and HVAC equipment). Make sure the data collected:

- represents the total energy used (including electricity, gas and fuel e.g. diesel)
- can be used for external benchmarking – check with the NABERS website or your Accredited Assessor to make sure the data you collect is useful for evaluating and achieving your NABERS targets.

Check that key service providers are able to collect data in the format and at the frequency you require. Do not rely solely on utility company invoices or statements. Check against trend performance and be conscious of which meters are being used to account for usage. Undertake a simple verification check on your energy data to ensure its accuracy and comprehensiveness.

6 Update building maintenance and operational procedures

Review building maintenance and operational procedures to make sure that energy savings measures are part of everyday activities. For example, check that:

- poor maintenance of energy intensive equipment is not causing energy wastage
- standard building operating procedures are not causing lights or equipment to be left on unnecessarily

Energy audits and detailed technical reviews

It's good practice to undertake energy audits to provide a detailed analysis of energy usage, the savings that can be made and the cost of achieving those savings. An audit may cover a whole building or may concentrate on an individual item or process, e.g. HVAC equipment.

AS 3598:2000 *Energy Audits* includes information that will help you identify the appropriate audit scope for your situation, e.g. will you be best served by a desktop assessment or a detailed analysis with a high level of accuracy and including cost estimates? AS 3598:2000 *Energy Audits* lists the benefits of energy auditing and provides guidance on the auditing process, as well as outlining a typical energy management program.

Detailed technical information can be sourced from building services designers and manufacturers and through industry associations such as the Australian Institute of Refrigeration Air Conditioning and Heating (AIRAH).

AIRAH has a peer-based assessment procedure for energy auditors who are competent in preparing Level 3 standard energy audits. To access a register of these auditors go to www.airah.org.au/ene_aud.asp.

The Greenhouse Challenge Plus program also has a helpful range of energy audit tools, see www.environment.gov.au/settlements/challenge/members/energyaudittools.html

- sensors are calibrated so systems are working as designed
- control loops are fine-tuned for seasonal variations.

Pay careful attention to the mid seasons, when it's most likely that both cooling and heating will occur. Make sure temperature set points are suitable for efficient operation.

7 Integrate energy management into contracts

Review energy contracts to identify rewards for energy conservation initiatives, e.g. energy performance contracting. Build energy management requirements in to other contracts such as controls contracts and those for subcontractors working on site. Make energy efficiency a key performance indicator for maintenance and controls contractors.

8 Report performance monthly

Include energy management in regular base building reporting. Ensure monthly reporting tracks performance against targets, and investigate variations or unusual events. Include performance monitoring results in your monthly property sustainability report. Use Worksheet 3.4C as a guide or adapt it and integrate it into your existing monthly reports.

At team meetings discuss monthly performance and the measures taken to maintain or adjust building services so they make the best contribution to meeting your energy targets.

9 Engage tenants

Regularly engage with your tenants to support them in reducing their energy use and keep them-up-to date on the performance improvements you are working on. Make them a part of the process and let them know how you are improving their building.

Encourage tenant's staff and key contractors to reduce energy too, by turning off lights when not required, purchasing energy efficient equipment, appliances and services, and appropriately maintaining any HVAC equipment they own.

Check that tenant HVAC systems are energy efficient and integrated with the base building operations. Make sure tenants' HVAC equipment is not fighting against your base building HVAC.

Easy wins

Some common 'easy win' energy efficiency initiatives include the following:

- Increase the energy efficiency of lighting systems, including controls and lamps, and improve user access to zoned lighting controls both during and after common working hours.
- Consider removing lamps ('de-lamping') where applicable.
- Consider the opportunities from power factor correction.
- Review winter and summer set points for your air conditioning.
- Increase control of lighting in areas only occasionally occupied by installing motion detectors or similar devices.
- Educate staff so they understand the merits of switching off equipment that is not being used.
- Review, and where feasible, reschedule the operational hours of building HVAC, in particular the system's evening shut-down or early morning starts.
- Replace inefficient HVAC motors and equipment when they're at the end of their useful lives.
- Review the feasibility of using variable speed drives on existing motors.

(Continued next page)

Encourage tenants to:

- turn computers off when not in use
- turn lights off when not in use
- fine tune after-hours lighting – talk to tenants about their hours of operation so you can make sure your building management system is turning lights on only in areas that need it
- use fire stairs in lieu of lifts when moving between floors
- purchase energy saving equipment
- look for any savings that could be made with heating and cooling – see the smart thermostat case study
- implement energy saving measures in their fitout
- participate in recognition programs e.g. CitySwitch Green Office (previously the 3CBDs Greenhouse Initiative); see www.cityswitch.net.au
- make sure their fitouts don't interfere with base building HVAC operation.

For more information about helping tenants to reduce their energy use, see the *Tenant Energy Management Handbook* (download it from www.nabers.com.au). See also Sections 3.3: 'Tenant engagement and green leases' and 4.3: 'Sustainable fitouts' for more information about working with tenants on reducing energy consumption.

10 Review performance annually

Review your energy consumption trends.

- How have you progressed against your targets?
- What can you do over the next 12 months to improve performance?

Include energy in your annual resource efficiency performance review. Section 3.4 and Worksheet 3.4D provide more detail and a template for this.

Public reporting of your performance is the key to ensuring accountability and a positive corporate reputation amongst your stakeholders. Your annual review and report should include official, accredited NABERS ratings. This gives stakeholders confidence that the reported standards are reliable, and that you are committed to achieving the targets you have established.

Update your energy action plan once you have completed your annual review.

Easy wins (continued)

- Install submetering and 'smart metering' technologies that will let you quickly and easily detect changes in operations or excessive use.
- Review and improve building management and control systems of HVAC, water services and lighting operational cycles.
- Make sure that inefficient water management is not generating unnecessary water heating.
- Set performance standards in energy contracts to ensure more accurate information is available to building management, and energy efficiency and peak demand reduction are considered.
- Undertake energy audits to identify measures to be included in management plans which focus on incremental improvement and regular monitoring, as well as larger one-off capital improvements.
- Look at alternative energy sources and renewable options such as accredited GreenPower.

Surprise results

Being intensely involved in managing a building can make it difficult for you to be objective. For example, a building that has excellent management practices can suggest to its managers that there is nothing more to do, but a poor result in benchmarking can lead to further investigation and show that systems need to be upgraded, or are being used in ways that were not intended in the building or services design. This exact scenario has unearthed some buried opportunities, with some buildings improving their performance to beyond what they thought was achievable.

Further information

- Australian Institute of Refrigeration Air Conditioning and Heating (AIRAH) has a number of technical papers, including AIRAH DA19 'HVAC&R maintenance', industry best practice measures and schedules for the whole range of HVAC&R plant and equipment, www.airah.org.au
- Australian Building Codes Board, www.abcb.com.au
- NSW Green Business Program for funding opportunities, www.environment.nsw.gov.au/grants/ccfgbp.htm
- *ESD Design Guide for Office and Public Buildings*, Edition 3, Department of the Environment, Water, Heritage and the Arts, May 2007, www.environment.gov.au/settlements/publications/government/esd-design/index.html
- Accredited GreenPower, www.greenpower.gov.au
- NABERS, www.nabers.com.au
- Green Star Tools, www.gbca.org.au
- Property Council of Australia Energy Guidelines 2001, section 4, 'Setting Energy Targets'
- SEAV Building Energy Brief for Commercial and Public Buildings, 2003, www.energy-toolbox.vic.gov.au/dmdocuments/building_guidelines/Building_energy_brief_v1.3b.pdf
- *Tenant Energy Management Handbook*, www.nabers.com.au
- The Engineering Sustainable Solutions Program Sustainable Energy Solutions Portfolio, www.naturaledgeproject.net/Sustainable_Energy_Solutions_Portfolio.aspx
- Greenhouse Challenge Plus Energy Audit tools, www.environment.gov.au/settlements/challenge/members/energyaudittools.html

Carpark working overtime

'Analysis of smart metering data collected at 1 York Street Sydney over a 6-month period found that the energy consumption for the carpark supply and exhaust fan was a constant load with no noticeable reduction for weekends and after hours.

The metering contractors notified the building engineer through the monthly report, who then asked the building management systems (BMS) contractor to investigate further. The BMS technician found that the settings on the carpark ventilation controller were incorrect. By reprogramming the correct settings into the controllers the fans now operate only on demand or when carbon monoxide levels are high.

Estimated annual savings calculated from the smart metering data:

- Total savings: $9,500
- Total reduction in usage: 119,212 kWh
- Total reduction in emissions: 112,212 kg/$Co_{2\text{-}e}$'

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Worksheets

Review and use these Word documents:

3.5A Energy action plan

3.5B Energy checklist – base building

Worksheet 3.5A

Energy action plan

This is an example only – adapt this worksheet to suit your organisation's requirements, and review your plan on an annual basis.

Property name:		
Address:		
NLA or GLA of building (m^2):		
Date:	Prepared by:	Approved by:
Key contractors for the following services:		
HVAC:	Controls:	
Electrical:	Cooling towers:	
Lighting:	Lifts:	
Metering:	Other:	

Energy efficiency targets for financial year: *insert your targets*

	Base building energy		**Whole building energy**	
	Previous year actual	**Annual target**	**Previous year actual**	**Annual target**
Total electricity (kWh)				
Total gas (MJ)				
Total other fuels (L)				
Total energy (MJ/m^2) [1]				
Total cost of energy supply ($)				
Total cost of energy supply ($/m^2$)				
Total CO_2 emissions (tonnes) [2]				
NABERS Energy rating				
Other:				

[1] To convert kWh to megajules (MJ) multiply by 3.6

[2] To convert kWh to kg of CO_2 see the National Greenhouse Accounts (NGA) Factors for the latest greenhouse emission factors, Australian Government Department of Climate Change, www.greenhouse.gov.au/workbook/index.html

Short-term opportunities

(Actions with a payback of typically less than 3 years)

	Actions or initiatives to be taken to achieve targets or reduce energy consumption	**Responsibility**	**Expected energy savings** (kWh or MJ)	**Cost to implement**	**Payback period or internal rate of return**	**Time required to implement**	**Planned completion date**	**Actual completion date**
	HVAC ventilation							
	HVAC cooling/heating							
	HVAC pumping							
	HVAC controls							
	Lighting equipment							
	Lighting controls: dimming, switching and time control systems							

	Actions or initiatives to be taken to achieve targets or reduce energy consumption	**Responsibility**	**Expected energy savings** (kWh or MJ)	**Cost to implement**	**Payback period or internal rate of return**	**Time required to implement**	**Planned completion date**	**Actual completion date**
	Domestic hot water							
	Lifts							
	Miscellaneous							

Summary for short-term opportunities

Total energy savings (kWh or MJ):
Total energy savings as a % of total use
Total cost savings ($)
Total cost savings as a % of total cost

Sign:	Sign:
Date:	Date:

Medium-term opportunities

(Actions with a payback of typically between 3 to 5 years, often with other benefits too.)

	Actions or initiatives to be taken to achieve targets or reduce energy consumption	**Responsibility**	**Expected energy savings** (kWh or MJ)	**Cost to implement**	**Payback period or internal rate of return**	**Time required to implement**	**Planned completion date**	**Actual completion date**
	HVAC ventilation							
	HVAC cooling/heating							
	HVAC pumping							
	HVAC controls							
	Lighting equipment							
	Lighting controls: dimming, switching and time control systems							
	Domestic hot water							

	Actions or initiatives to be taken to achieve targets or reduce energy consumption	**Responsibility**	**Expected energy savings** (kWh or MJ)	**Cost to implement**	**Payback period or internal rate of return**	**Time required to implement**	**Planned completion date**	**Actual completion date**
	Lifts							
	Miscellaneous							

Summary for medium-term opportunities

Total energy savings (kWh or MJ):
Total energy savings as a % of total use
Total cost savings ($)
Total cost savings as a % of total cost

Sign:	Sign:
Date:	Date:

Long-term opportunities

(Actions with a payback of typically more than 5 years, but with other significant benefits such as improved maintenance and conditions.)

	Actions or initiatives to be taken to achieve targets or reduce energy consumption	**Responsibility**	**Expected energy savings** (kWh or MJ)	**Cost to implement**	**Payback period or internal rate of return**	**Time required to implement**	**Planned completion date**	**Actual completion date**
	HVAC ventilation							
	HVAC cooling/heating							
	HVAC pumping							
	HVAC controls							
	Lighting equipment							
	Lighting controls: dimming, switching and time control systems							
	Domestic hot water							

	Actions or initiatives to be taken to achieve targets or reduce energy consumption	**Responsibility**	**Expected energy savings** (kWh or MJ)	**Cost to implement**	**Payback period or internal rate of return**	**Time required to implement**	**Planned completion date**	**Actual completion date**
	Lifts							
	Miscellaneous							

Summary for long-term opportunities

Total energy savings (kWh or MJ):
Total energy savings as a % of total use
Total cost savings ($)
Total cost savings as a % of total cost

Sign:	Sign:
Date:	Date:

Worksheet 3.5B

Energy checklist – base building

This checklist should be read in conjunction with AS 3598:2000 *Energy Audits*. It sets out issues to be investigated as part of a comprehensive energy audit for an existing commercial building. This is an example only – adapt this worksheet to suit your organisation's requirements, e.g. delete items not applicable to the audit type or scope, or property being audited.

Item check	Yes, No or N/A	Recommended actions
Lighting		
Calculate the installed lighting power densities and compare to Green Star best practice. Consider using Green Star Office Existing Building Energy Calculator and Lighting Calculator to identify performance, including a preliminary NABERS rating and office lighting power density. See www.gbca.org.au/green-star/rating-tools/		
Based on the above analysis, are there areas where lighting power density can be reduced?		
Are switched lighting zones appropriate to floor occupation patterns? Is there an opportunity to adjust zones to reduce energy consumption?		
Do occupants understand and use the controls for switching circuits? Can on-floor location or labelling of controls be improved?		
Are power reduction devices installed to reduce power to fluorescent lighting once turned on?		
Are triphosphor lamps installed or can they be installed? Can 'de-lamping' be implemented?		
Are diffusers needed? Are existing diffusers efficient? Are diffusers and fittings clean?		
Are surface finishes light in colour to reflect light?		
Can incandescent lamps be replaced with compact fluorescent lamps or similar? (high efficiency, low wattage)		
Are lights left on in unoccupied areas for more than 30 minutes?		
How and when are lights switched on and off each day? Are automatic lighting controls installed and how well to they relate to hours of occupation?		
Are after-hours lighting control schedules adequate to avoid unnecessary energy use?		
Is there reduced perimeter lighting capability?		
Are light levels (lux) suitable for the tasks and can they be reduced?		
Can automatic controls be permanently overridden by mistake?		

Item check	Yes, No or N/A	Recommended actions
High density discharge lighting – is it the most efficient possible? (e.g. can low pressure sodium be used?)		
Check need for controls in specific areas using occupancy detectors, clockwork (e.g. switches where user dials up time required) or time delay switches in rooms not in constant use.		
Are there low voltage halogen lights, and can these be replaced by more efficient lamps?		
Are there decorative lights, and can these use more efficient lamps or be switched off during normal operation?		
Other:		
Other:		
Heating, ventilation and air conditioning (HVAC)		
Are any peak energy demand reduction measures in place? (distributed energy systems, cogeneration etc). If so, to what % capacity?		
Is fresh air supply adequate for demand?		
Check that on/off programming is appropriate to building use.		
Are after hours and holidays programmed correctly?		
For after-hours use, does HVAC operate only for the spaces required?		
Does cooling or heating occur while building is generally unoccupied?		
Can automatic controls be manually or permanently overridden?		
Are there any heaters that are not thermostatically controlled?		
Are personal radiators or fans used anywhere?		
Are northern or western facades separately controlled?		
Are HVAC components appropriately sized?		
Could higher efficiency motors be used?		
Is a low load chiller present for after-hours use?		
Should room air conditioners or split systems be installed in small areas with frequent after-hours use to avoid the need to turn on the full system?		
How old is the HVAC plant? What is its expected economic life?		
Is it a cost effective HVAC solution for this application, considering whole of life costs?		
Is the control system able to be operated by building engineers and capable of achieving reasonable economy?		

Item check	Yes, No or N/A	Recommended actions
Are thermostats located away from heating and cooling devices or external facades?		
Are temperature set points appropriate? Do occupants generally report they are comfortable all year around? Should the range of acceptable temperatures be expanded?		
Is there floor zoning with accessible controls accessible to users?		
Can automatic doors, air curtains or weather screens in front of doors be used to reduce heat loads or losses in foyers?		
Can heat loss or gain be reduced by insulating ducts, pipes, walls or floor spaces; painting outside surfaces with light colours; tinting windows or closing drapes at certain times; or installing building shading devices (inc. trees)?		
Could external shading be improved?		
Are outside doors fitted with automatic door closers?		
Would ventilation of equipment rooms and roof spaces be cost effective?		
Are high efficiency filters used and replaced regularly?		
Are outdoor air volumes increased or reduced appropriately?		
Are outside air levels appropriately matched to the need for outside air at different times?		
Can carbon dioxide sensing or other methods be used to alter the amount of fresh air intake?		
Are processes that contaminate the air isolated so that air changes for other areas are not excessive?		
Is there excessive heat build-up in air plenums due to machinery or solar heat loads?		
Is an economy cycle present or appropriate?		
Can evaporative cooling be used, either as the only source of cooling or to pre-cool outside air for a refrigeration system?		
Is there any reheating of air carried out that could be further developed or avoided?		
Are humidity controls present that can be avoided, relaxed or accomplished more efficiently?		
Is there a time delay on after-hours air conditioning controls? What is the time delay period? Can it be shortened?		
Can the after-hours conditioning button be used to manually turn equipment off?		
Are users aware of this feature? Can labelling be improved?		

Item check	Yes, No or N/A	Recommended actions
Have you considered hybrid cooling tower alternatives that provide lower energy or water conservation options?		
Is all equipment accessible for maintenance?		
Have you considered recommissioning your HVAC and controls system?		
Do you understand how your building automation system operates and how to get the best energy performance from it?		
Have you considered trimming pump impellors?		
Are there opportunities for variable speed drives and variable expansion valves?		
Have you considered using variable speed drives for fans pumps where applicable?		
Can access to after-hours air conditioning be controlled by building managers, and users charged directly for after-hours air conditioning use?		
Are there opportunities for heat recovery (e.g. run-around coils)?		
When were air conditioners last maintained? How often are they maintained? Can maintenance procedures be improved?		
Are dampers well maintained and operating correctly?		
Are filters, fins and heat exchange coils cleaned?		
Are valves checked for leakage?		
Is any air leaking from ducts, doors or windows?		
Check duct insulation by checking for a rise or drop in temperature by measuring temperature at the beginning and end of pipe runs. (A significant temperature change means that insulation needs upgrading, especially if pipes are exposed to the outdoors or enclosed in a hot roof space.)		
Perform an operational and staging check on chillers and boilers. (Analyse equipment that measures all significant operating parameters and calculate a chillers actual coefficient of performance.)		
Are fan static pressures too high? Can duct resistance be reduced by reducing or removing sharp bends or modifying acoustic silencers?		
Check thermostat calibration and that sensors and controllers are operating correctly. Are moving parts properly lubricated?		
Can you implement or optimise existing stop/start or other ‘start up later/switch off earlier’ operating time strategies?		
Is any form of flushing/night purge used?		

Item check	Yes, No or N/A	Recommended actions
Can heaters or chillers be switched off earlier because the building's thermal inertia maintains conditions for some time?		
For leased buildings, check that metering of after-hours air conditioning use and calculation of bills for after-hours air conditioning use is according to actual energy use + 10%.		
For leased buildings, should a kilowatt hour meter be installed to log after-hours air conditioning use instead of an hours-run meter?		
For leased buildings, check that programmed air conditioning start and stop times are not outside the hours of operation being paid for by the building owner.		
Metering, tariffs and billing issues		
Is submetering provided to all high-energy uses in the building? Describe.		
Are tenancies submetered?		
Is carpark energy use metered separately?		
Is load shifting, shedding or power factor correction feasible to reduce energy costs?		
Should a tariff shift be adopted?		
For leased buildings, check which circuits are on which billing meters (to avoid paying for someone else's energy).		
Domestic hot water		
Are all hot water heaters needed? Are any over-sized?		
What hours do hot water heaters run? What hours do they need to run? Can time switching be justified?		
Are existing hot water units efficient? What are their likely economic lives? What should they be replaced with when they reach the end of their lives? Should they be located closer to usage points?		
Are showerheads 3-star and taps 4-star WELS-rated or greater?		
Are flow-restricting valves used on hot water taps?		
Is there any leakage of hot water? (e.g. taps, pipes or valves)		
Do circulating pumps operate when the building is unoccupied? Are they necessary at all times during occupation?		
Is the water temperature unnecessarily above 60-65 degrees?		
Are pipes insulated (min. 10 mm) between hot water heater and taps?		
Should the hot water tank be insulated or more insulated?		

Item check	Yes, No or N/A	Recommended actions
Is heat reclamation from other equipment on site a possible source of water heating?		
Other		
Are lifts programmed to minimise excess travel?		
Are lift motors high efficiency?		

Managing water

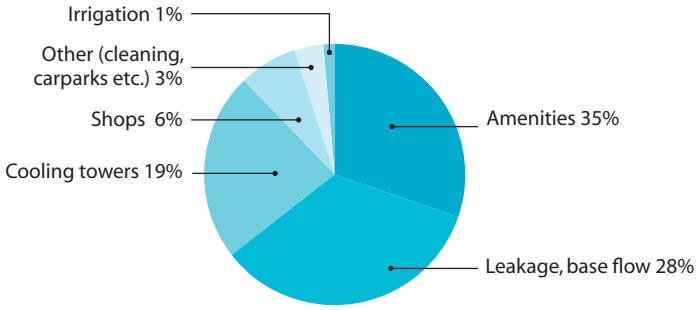
3.6

Context

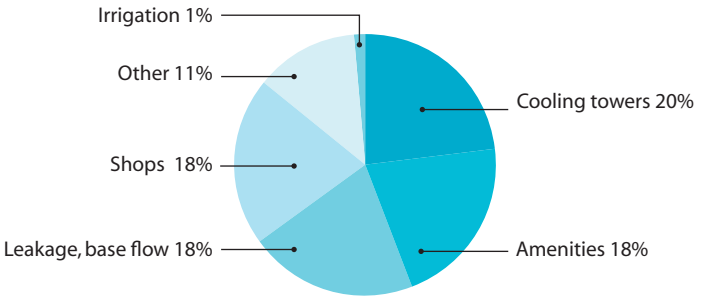
Long-term uncertainty about water supply and prolonged drought has focused our attention on the urgent need to treat water as a scarce resource. Commercial buildings in greater Sydney alone use nearly 75 million litres of water every day (Sydney Water 2007). Couple this with rising water prices, and we have an unquestionable reason why offices and retail centres need to effectively manage their water consumption.

In NSW, a NABERS Water rating improvement of just 1 star equates to water savings of approximately 25%. This should be an achievable goal for your organisation and will demonstrate your environmental credentials as well as save you money.

Typical water consumption of commercial office buildings, including leaks



Typical water consumption of retail centres, including leaks



Source: *Best practice guidelines for water conservation in commercial office buildings and shopping centres*, Sydney Water 2007.

What's in this section

Same as the early 1970s

Community involvement in saving water has been a real success story in Sydney, with the same amount of water being used today as in the early 1970s despite population growth of over 1 million people since then. This success makes it all the more important that the commercial property sector is not seen as wasteful when people have made significant cut backs at home.

Steps: Managing water

1 Measure baseline performance

Identify the current water performance of your building or portfolio. Section 3.4 explains how to do this as part of assessing your property's overall sustainability performance, and Worksheet 3.4A will help you to compile information detailing annual water usage, including:

- total water consumption, plus comparisons to the previous year
- details of metering in place, particularly for areas of high water usage e.g. cooling towers, food courts
- information about whether leaks are a major issue
- information about whether any existing water saving devices have been installed such as dual flush toilets or flow restrictors in taps
- monthly performance data
- your NABERS Water rating.

Worksheet 3.4C is a template for summarising monthly performance data.

It's likely that the process of assessing your water baseline will reveal gaps in your data, e.g. you may have only one water bill for the whole building, with no submetering. The process will also reveal whether any opportunities to supplement your water supply have been investigated e.g. through rainwater harvesting. These discoveries can form the basis of your water action plan (Step 4 below).

2 Benchmark performance

An important aspect of assessing your baseline performance is benchmarking the building's water performance compared to others in the market. Benchmarking your water use may help you identify whether leaks are a problem or if you are using much more water than other similar buildings. To benchmark your building, use the NABERS Water rating system or compare your building to the Sydney Water data.

When your building or portfolio is rated against the benchmarks, you need to ask:

- How does your building or portfolio compare?
- What percentage of your portfolio is below or above average?
- Is this acceptable for the market positioning of your building or portfolio?

Sydney WATER

Water management best practice

An invaluable reference for building managers is *Best practice guidelines for water conservation in commercial office buildings and shopping centres*, published by Sydney Water in 2007. The guidelines:

- set benchmarks for water use in commercial buildings and shopping centres
- explain how to implement water conservation projects
- provide advice on alternative water sources
- contain a practical water saving checklist to identify water saving opportunities. (included in this guide as Worksheet 3.6B).

The guidelines were prepared as part of Sydney Water's Every Drop Counts Business Program for which Sydney Water was awarded the Stockholm Industry Water Award 2006, a Banksia Award for Eco Innovation 2006, and a Department of Environment and Climate Change NSW Sustainability Green Globe Award – Government category – 2008. The best practice guidelines also made Sydney Water a finalist in the 2008 Banksia Awards – Education category.

Find out more about the Every Drop Counts Business Program at www.sydneywater.com.au/SavingWater/InYourBusiness/EDCBusinessProgram.cfm

every drop counts

- What are the ramifications for obtaining and retaining environmentally aware tenants?
- What are the ramifications for the value of your asset?

Use the benchmarks to set improvement targets and to identify and prioritise properties that may need immediate action. See Section 3.4 for more information about benchmarking using NABERS, and also see Sydney Water's *Best practice guidelines for water conservation in commercial office buildings and shopping centres*, available online at www.sydneywater.com.au/SavingWater/InYourBusiness/

Self assessment

You can self-assess building water use at no cost using the NABERS performance rating calculator. See www.nabers.com.au. This calculator is applicable to whole buildings only.

Self-assessment can give you a rough idea of performance, but you need to be careful that the information you enter is as accurate as possible and conforms to the data needed by the calculators.

If you are uncertain about self-assessment look for further information on the NABERS website or seek advice from a NABERS Accredited Assessor.

Accredited assessment

To ensure the accuracy of the results you obtain, and to use the rating to promote your property or organisation, or to use the NABERS trademarks, you must obtain a certified rating from a NABERS Accredited Assessor. Make sure you use an assessor with good knowledge of sustainability practices in both commercial property design and management. A list of assessors is available at www.nabers.com.au. An Accredited Assessor can also give you general advice or help you with an unofficial self-assessment.

3 Set performance targets

Set firm targets for reducing water consumption with milestones for action. Sydney Water suggests organisations that conduct a water audit can identify annual savings targets of 20% or more.

Water targets should relate to your organisation's sustainability goals and should be practical and achievable at a stretch. You may wish to articulate your water commitments and targets in a dedicated water management policy or as part of your overall sustainability policy (See Section 2.3: 'Developing a sustainability policy for your organisation'.)

NABERS

About NABERS

NABERS is the National Australian Built Environment Rating System managed by the Department of Environment and Climate Change NSW. NABERS is a performance-based rating system which measures the operational environmental impacts of existing buildings.

NABERS office tools can be applied to three distinct situations:

- **Tenancy** ratings that cover the space occupied by a single tenant and under the control of that tenant
- **Base Building** ratings that cover all office spaces for that building, and measure the parameters that are under the control of the landlord or base building
- **Whole Building** ratings that are a combination of both Tenancy and Base Building for the situation where a tenant is the owner and/or has control of all services.

For more information see www.nabers.com.au

Water target examples

Example base building water performance targets include:

- increasing the building's NABERS Water rating by 1 star within a 12- month timeframe (be sure to set a specific date)
- reducing the building's water intensity (kL/m^2 or kL/patron) by 30% within 18 months
- installing metering for all water intensive activities within 6 months
- implementing water harvesting measures to reduce mains supply water use within 12 months.

Portfolio targets might include:

- achieving an average 4.5-star NABERS Water rating across the portfolio by a specific date
- reducing water consumption by 30% by a specific date.

When setting targets ask the following questions:

- How do your targets compare with your peers in the market?
- Have you informed your internal and external stakeholders of the targets? Do the targets meet the stakeholders' current and future expectations?
- Can you verify progress in relation to the targets?

Integrate the targets and minimum standards into service or performance contracts with relevant service providers, particularly for cooling tower services and landscaping. Integrate the targets into staff performance where appropriate and make someone responsible for achieving them.

Make sure your targets are not numbers hidden in a report. Make them part of 'business as usual' operations. Promote targets to key stakeholders and ensure they understand the process you have committed to and the intended benefits.

4 Develop a water action plan

Develop an action plan to improve performance and achieve your water savings targets. The plan should identify responsibilities and timeframes for action. You could use Worksheet 3.6A as a guide. Work out what measures need to be undertaken, and when. Assess each action against the business case to determine if the initiatives are:

- short-term opportunities, i.e. actions having a short payback period (typically less than 3 years) or yielding significant water savings. These may often involve changes in building maintenance and operation procedures, such as cleaners reducing water used during cleaning operations or outdoor maintenance staff sweeping rather than hosing down hard surfaces – but don't trade the hose for a carbon intensive leaf blower!
- medium-term opportunities, i.e. actions having a payback period of 3 to 5 years, and may depend on contract renewal timeframes, or
- long-term opportunities, i.e. actions having a payback period of 5 years or more, involving capital upgrades and retrofits and therefore requiring budget allocations over a number of years.

Also identify whether the actions will require collaboration with tenants, such as refurbishment activities and fitouts.

Every Drop Counts

'Sydney Water's Every Drop Counts Business Program helps organisations to implement water savings measures. As of September 2008, four property owners have been leaders and reached 5-stars under the 'One–2–Five' water mangagement diagnostic process. This rating represents best practice and continuous improvement in water management.

The Every Drop Counts Business Program can help you with conducting water audits. Typical recommendations arising from an audit include:

- setting up systems for regular monitoring of water meters
- increasing frequency of preventive maintenance programs to detect early leaks
- reducing flow rates in showers
- reducing size of toilet cisterns to dual flush or 6 litres per flush
- reducing flow rates in taps
- downsizing main meters
- adjusting urinal flush sensors
- increase cooling tower water concentration cycles
- converting to waterless urinals where possible.'

Sydney Water Every Drop Counts Business Program

Going waterless

'The Direct Property Investment Fund (one of the unlisted property funds within Colonial First State Global Asset Management) undertook a pilot project at 39 Martin Place Sydney using a water soluble block placed in urinals. The product reduces the need for regular flushing and has no detrimental impact on sewer outflow or the plumbing system. The 12-month trial achieved:

- total water supply savings of $12,450 or 37% of annual costs
- total reduction of 14.8 megalitres

with a 7-month investment payback.'

Colonial First State Global Asset Management, www.cfsgam.com.au

Identify water conservation initiatives

Once you have identified areas of poor performance, some easy wins will be readily actionable, and should be included in either maintenance programs or future upgrade or refurbishment projects. Some common water conservation measures are listed below.

You could use Sydney Water's water saving checklist provided in Worksheet 3.6B to start identifying improvement steps. The checklist is structured around base building equipment and management processes that are major water consumers:

- amenities
- cooling tower operations and cooling systems
- kitchens and food courts
- fitness centres
- outdoor areas
- cleaning activities.

Key actions might include undertaking detailed technical reviews and water audits. Sydney Water's Every Drop Counts program may be able to help you, see www.sydneywater.com.au/SavingWater/InYourBusiness/EDCBusinessProgram.cfm

See *Your Building* for further information on water saving opportunities: www.yourbuilding.org/display/yb/Home

5 Collect data and monitor performance

Review existing water monitoring and data management capabilities, including the building management and control system. What improvements are required so that accurate data can be collected and reported at least monthly? When designing your monitoring system make sure key tenants or water intensive areas can be submetered, e.g. retail, food courts, fitness centres, carparks and HVAC equipment, such as cooling towers. Make sure the data collected:

- represents the total water used
- can be used for external benchmarking – but check the NABERS website or with your Accredited Assessor first to make sure the data you collect is useful for evaluating and achieving your NABERS targets.

Check that key service providers are able to collect data in the format and at the frequency you require. Do not rely solely on utility company invoices or statements. Check against trend performance and be conscious of which meters are being used to account for usage. Undertake a simple verification check on your water data to ensure its accuracy and comprehensiveness.

Water audits

Conduct a water audit to identify measures you can implement through incremental improvements and regular monitoring as well as larger one-off capital improvements. An audit is particularly important if the property has a history of poor water performance when compared to other similar properties on a kL/m^2 NLA basis, or if the NABERS Water ratings are consistently poor. Make sure that as an outcome of the auditing process you have a comprehensive understanding of flow rates, the water balance and likely leakage rates as well as costed options for capital projects and operational measures that will improve efficiency in the short and longer term.

You could use the checklist in Worksheet 3.6C to outline the audit scope of works as recommended by Sydney Water.

Priorities for submetering

Sydney Water recommends that priority for submetering is given to:

1 cold water supply
2 hot water supply
3 amenities
4 cooling towers
5 food courts and restaurants
6 outdoor areas and water features
7 retail shops
8 sewer discharge.

See Sydney Water's *Best practice guidelines for water conservation in commercial office buildings and shopping centres* for more detail: www.sydneywater.com.au/SavingWater/InYourBusiness/.

6 Update building maintenance and operational procedures

Review building maintenance and operational procedures to make sure that water saving measures are part of everyday activities. For example, check that:

- poor maintenance of water intensive equipment is not causing wastage
- standard building operating procedures are not allowing leaks to go unfixed.

Look for opportunities to capture and reuse water from weekly fire system tests. This can save up to 60 kL of water per test (Sydney Water).

7 Integrate water management into contracts

Review water and other services contracts to identify rewards for water conservation initiatives, e.g. water performance contracting. Build water management requirements in to other contracts, such as cleaning and subcontractors working on site. Make water conservation a key performance indicator for maintenance and controls contracts. See Section 5: 'Sustainability and the Supply Chain'.

8 Report performance monthly

Include water management in regular base building reporting. Ensure monthly reporting tracks performance against targets, and investigate variations or unusual events. This is in addition to responding to water use discrepancies if information about them is available (e.g. daily or real time monitoring). Include performance monitoring results in your monthly property sustainability report. Use Worksheet 3.4C as a guide or adapt it and integrate it into your existing monthly reports.

At team meetings discuss monthly performance and the measures taken to maintain or adjust aspects of building services so they make the best contribution to meeting your water conservation targets.

9 Engage tenants

Regularly engage with your tenants to support them in reducing their water use and keep them up-to date on the performance improvements you are working on. Make them a part of the process and let them know how you are improving their building.

Easy wins

Some common 'easy win' water conservation initiatives include the following:

- Install submetering and 'smart metering' technologies so you have better information for optimising the management and control systems for water services operational cycles.
- Install water saving devices in toilets and plumbing systems, including waterless urinal technologies, low flow taps and urinal sensors.
- Review and increase cooling tower water concentration cycles.
- Install measures to capture and recycle water used for fire systems tests.
- Identify wastage and fix leaks. In particular, check valves, taps and fittings in amenities areas, and check cooling towers for splash and drift losses.

Helping to reduce use of bottled water

By adding a reliable source of filtered water in office kitchens, you could help to reduce the use of bottled water.

Australians spent $385 million on 250 million litres of bottled water in 2006 (AC Nielson). It takes a whopping 141,666 barrels of oil just to make the resin for the plastic bottles (Polyethylene Terephthalate or PET). Then another 314,465 barrels of oil are used to convert the PET to plastic bottles, fill the bottles, transport them and refrigerate the water. This much oil adds up to over 60,000 tonnes of CO_2 emissions. So every time you drink a litre of bottled water, you're using 200 ml of oil (Pacific Institute for Studies in Development, Environment & Security).

Only 35% of bottles actually make it to a recycling depot (Plastics and Chemicals Industry Association 2005–06 report). And for those bottles that are recycled, the recycling process uses another 1,600 barrels of oil each year.

Department of Environment and Climate Change NSW

Encourage tenants to:

- report leaks promptly
- check taps are turned off
- choose water efficient appliances, such as 4-star dishwashers (see www.waterrating.gov.au)
- implement water savings measures in their fitout.

Sydney Water or your water utility can help by providing a range of educational resources such as stickers and posters about saving water.

Raise awareness on reducing water consumption by holding information sessions for tenants, and encourage tenants to reduce water use at home too. Tenants might be interested in rating their home water use compared to similar households using NABERS for homes, see www.nabers.com.au

10 Review performance annually

Review your water consumption trends.

- How have you progressed against your targets?
- What can you do over the next 12 months to improve performance?

Include water conservation in your annual resource efficiency performance review. Section 3.4 and Worksheet 3.4D provide more detail and a template for this.

Public reporting of your performance is the key to ensuring accountability and a positive corporate reputation amongst your stakeholders. Your annual review and report should include official, accredited NABERS ratings. This gives stakeholders confidence that the reported standards are reliable, and that you are committed to achieving the targets you have established.

Update your water action plan once you have completed your review.

Benefits of a water management plan

'Jones Lang Lasalle undertook an audit of water consumption at the Riverside Centre Brisbane, owned by General Property Trust.

Outcomes of the audit suggested the need for a systematic approach using a Water Management Plan. The Plan included a number of water reduction strategies associated with either cyclic maintenance or refurbishment projects.

Over a 3-year period, water efficiency measures included:

- refurbishing existing flush valves to minimise leakage
- replacing membranes around external fountains
- replacing the building cooling towers
- installing additional submetering to identify systems with high water consumption.

The team is also investigating the feasibility of diverting wastewater from the cooling towers to the toilet flusherette system or the fountain make-up water system.

Benefits include:

- saving $11,539 over a 3-year period (a combination of reduced supply and wastewater charges)
- reducing water use by 6%
- saving an estimated 7.23 megalitres of potable water which equates to five Olympic-sized swimming pools.'

'Commercial Property Going Green', Jones Lang Lasalle 2004

Further information

- Australian Building Codes Board, www.abcb.com.au
- *Best practice guidelines for water conservation in commercial office buildings and shopping centres*, Sydney Water 2007, www.sydneywater.com.au/SavingWater/InYourBusiness/
- NABERS Water, www nabers.com.au
- NSW Green Business Program, www.environment.nsw.gov.au/grants/ccfgbp.htm

- *ESD Design Guide for Office and Public Buildings*, Edition 3, Department of the Environment, Water, Heritage and the Arts, May 2007, www.environment.gov.au/settlements/publications/government/esd-design/index.html
- *Water efficiency guide: office and public buildings*, Department of Environment and Heritage, October 2006, www.environment.gov.au/settlements/publications/government/water-efficiency-guide.html
- Green Star Office Existing Building Tool, www.gbca.org.au
- Sydney Water Every Drop Counts (EDC) Business Program, www.sydneywater.com.au/SavingWater/InYourBusiness/EDCBusinessProgram.cfm.
- Water Efficiency Labelling and Standards (WELS) Scheme, www.waterrating.gov.au
- Metropolitan Water Plan, Water for Life, www.waterforlife.nsw.gov.au
- *Guidelines for Water Savings Action Plans*, www.environment.nsw.gov.au

Worksheets

Review and use these Word documents:

3.6A Water action plan

3.6B Water saving checklist

3.6C Planning a water audit – scope of work checklist

Worksheet 3.6A

Water action plan

This is an example only – adapt this worksheet to suit your organisation's requirements, and review your plan on an annual basis.

Property name:		
Address:		
NLA or GLA of building (m^2):		
Date:	Prepared by:	Approved by:
Key contractors for the following services:		
HVAC:	Plumbing (hot water):	
Cooling towers:	Landscaping:	
Metering:	Other:	

Water conservation targets for financial year: *insert your targets*

	Base building water		**Whole building water**	
	Previous year actual	**Annual target**	**Previous year actual**	**Annual target**
Total water (kL)				
Total water (kL/m^2)				
Total water per patron per day (L/patron/day)				
Total cost of water ($)				
Total cost of discharge ($)				
Total cost of trade waste ($)				
NABERS Water rating				
Other:				

Short-term opportunities

(Actions with a payback of typically less than 3 years)

	Actions or initiatives to be taken to achieve targets or potable water consumption	**Responsibility**	**Expected water savings** (kL)	**Cost to implement**	**Payback period or internal rate of return**	**Time required to implement**	**Planned completion date**	**Actual completion date**
	Amenities							
	Cooling towers and HVAC system							
	Kitchens and food courts							
	Specialist tenants including fitness centres							
	Outdoor areas and water features							
	Cleaning and tenant education (including signage)							

	Actions or initiatives to be taken to achieve targets or potable water consumption	Responsibility	Expected water savings (kL)	Cost to implement	Payback period or internal rate of return	Time required to implement	Planned completion date	Actual completion date
	Miscellaneous							

Summary for short-term opportunities

Total water savings (kL):
Total water savings as a % of total use
Total cost savings ($)
Total cost savings as a % of total cost

Sign:	Sign:
Date:	Date:

Medium-term opportunities

(Actions with a payback of typically between 3 to 5 years, often with other benefits too.)

	Actions or initiatives to be taken to achieve targets or reduce potable water consumption	Responsibility	Expected water savings (kL)	Cost to implement	Payback period or internal rate of return	Time required to implement	Planned completion date	Actual completion date
	Amenities							
	Cooling towers and HVAC system							
	Kitchens and food courts							

	Actions or initiatives to be taken to achieve targets or reduce potable water consumption	**Responsibility**	**Expected water savings** (kL)	**Cost to implement**	**Payback period or internal rate of return**	**Time required to implement**	**Planned completion date**	**Actual completion date**
	Specialist tenants including fitness centres							
	Outdoor areas and water features							
	Cleaning and tenant education (including signage)							
	Miscellaneous							

Summary for medium-term opportunities

Total water savings (kL):
Total water savings as a % of total use
Total cost savings ($)
Total cost savings as a % of total cost

Sign:	Sign:
Date:	Date:

Long-term opportunities

(Actions with a payback of typically more than 5 years, but with other significant benefits such as improved maintenance and conditions.)

	Actions or initiatives to be taken to achieve targets or reduce potable water consumption	**Responsibility**	**Expected water savings** (kL)	**Cost to implement**	**Payback period or internal rate of return**	**Time required to implement**	**Planned completion date**	**Actual completion date**
	Amenities							
	Cooling towers and HVAC system							
	Specialist tenants including fitness centres							
	Outdoor areas and water features							
	Cleaning and tenant education (including signage)							
	Miscellaneous							

Summary for long-term opportunities

Total water savings (kL):
Total water savings as a % of total use
Total cost savings ($)
Total cost savings as a % of total cost

Sign:	Sign:
Date:	Date:

Worksheet 3.6B

Water saving checklist

This is an example only – adapt this worksheet to suit your organisation's requirements.

Note: references to Chapters throughout this checklist refer to *Best practice guidelines for water conservation in commercial office buildings and shopping centres*, Sydney Water 2007.

	Yes/No	Recommended action
Managing your water		
Do you monitor and record your water use?		If no, read your meter at least daily or weekly, or install a continuous monitoring system. Record meter reading information so you can identify changes in water use.
Do you benchmark your water consumption?		If no, calculate a L/m^2/year figure and compare it against other buildings in your portfolio and the benchmarks in Chapters 3 and 4 of Sydney Water's *Best practice water conservation guidelines*, and use the free self-assessment tool available from the NABERS website (www.nabers.com.au). It may be preferable to get an accredited rating as part of your management and monitoring program.
Do you know where water is used in your office building or shopping centre?		If no, look at the average water balance graphs in Chapters 3 and 4 in Sydney Water's *Best practice water conservation guidelines* for guidance. Install submeters according to the priorities in Chapter 9 to develop your own water balance.
Do you know where the best opportunities to save water are?		If no: • check for leaks • check cooling tower operations • install flow restrictors on taps • remove all cyclical flush urinals • develop a water balance for your building and see where you are using most water.
Do you regularly review your organisation's water management?		If no, establish a management plan that incorporates water monitoring and conservation. There are tools available from water suppliers such as Sydney Water EDC Business Program or third party providers. Or use the template provided in the NSW Water Saving Action Plan guidelines and Worksheet 3.6A. Concentrate on achieving identified critical actions. Compare your results to previous reviews and rate your achievement of critical actions.
Do you review your submeters, or information from your continuous monitoring system regularly?		If no, establish work procedures so that a member of staff is responsible for water use information and knows what they need to do to if water use changes.

	Yes/No	Recommended action
Do you know how much water, and all associated charges (energy, pumping, chemical, sewer discharge) are costing your business?		If no, refer to information about the true cost of water in Chapter 6. Calculate your own water costs and associated charges. Knowing how much your water costs will establish a business case for water conservation.
Have you developed a water savings plan?		If no, look at the findings of this checklist then develop a water balance and a basic savings plan.
Do you have signs, posters and stickers in your building to encourage water conservation and remind people to report leaks?		If no, business partners in the EDC Business Program can co-brand stickers, posters and shower hangers.
Amenities		
Have you installed submeters on supply lines to amenities and hot water supply?		If no, install meters on supply lines to amenities, as described in Chapter 9. Conduct routine inspections and program maintenance to detect problems before they become large leaks.
Does your building have any cyclic flushing urinals?		If yes, replace urinals immediately with manually flushing urinals, automatic sensor units or ultra low flow or waterless urinals. Refer to Chapter 13.
Does your building have automatic on-demand urinal sensor flushing systems?		If yes, regularly check that sensors are working properly and not detecting unrelated movement. Check that solenoids are operating correctly and replace them if they are faulty or worn.
Does your building have single flush toilets?		If yes, replace single flush toilets in high use areas with 6/3 litre or 4.5/3 litre dual flush models. If toilets are in low use areas, restrict cistern volume and bring forward programmed replacement.
Does your building have dual flush toilets?		If yes, check the flush capacity. Older 11/5.5 litre and 9/4.5 litre dual flush toilets can be replaced with new 6/3 litre or 4.5/3 litre flush models.
Are cistern rubber seals on toilets replaced regularly?		If no, cistern rubber seals should be replaced every two years to prevent leaks.
Do you have a flusherette system?		If yes, check the flow rate and flush timing. Over time, wear will cause excessive flush volumes. Insert flow control regulators into valve bodies to reduce flow.
Do you have flow regulators in all hand basins?		If no, install flow regulators so that flow is reduced to at least 6 litres per minute.
Do you have water efficient showers?		If no, install flow regulators so that flow is reduced to at least 9 litres per minute or install WELS 4-star rated showerheads.
Cooling tower operations		
Does your building have cooling towers?		If yes, continue with this section. If no, go to the next section.

	Yes/No	Recommended action
Is there a water meter on the make-up water pipe?		If no, install a submeter and monitor the water consumption regularly.
When the pump is stopped, is there water flowing from the overflow drain pipe?		If yes, check that the drain valve is correctly set and if there are any leaks. Check if the valve is closed and adequately sealed.
When the pump is stopped, does the water flow out of the overflow drain pipe whilst the water is coming in through the make up water line?		If yes, this indicates that the ball float valve is incorrectly set. The ball float valve needs to be reset.
If you have a V shaped basin, when the pump stops does the cooling tower overflow?		If yes, consider installing a break tank, or a more precise make-up control.
Is there is a significant length of condenser water pipework running at high level, causing the tower overflow when the pump stops?		If yes, consider reconfiguring the pipework.
If you have two or more cooling towers interconnected, when the pump stops does water flow from the drain pipe?		If yes, check the ball float valve settings and the height of the tower basin. If one basin is higher than the other some modifications may be required.
Is the water overflowing the edge of the tower basin?		If yes, check that the overflow pipe is set correctly or not blocked.
Is the area around the tower regularly or constantly wet?		If yes, water is splashing out of the tower. Install or replace anti-splash louvres.
Is any leakage present in the tower, casing, basin, or any intake or exhaust ducts or flexible connectors?		If yes, joints need to be adjusted and sealed.
Does the cooling tower have drift eliminators, or old or ineffective eliminators?		If no, install a drift eliminator that limits drift loss to no more than 0.002%.
Do any pumps have packed gland pump seals?		If yes, ensure pumps are inspected monthly and seals tightened as needed. Also consider replacing the seals with mechanical seals.
Does your water treatment contractor clean the conductivity sensor every month?		If no, make this part of their ongoing duties. Ensure it is recalibrated every month.
Is the water treatment system installed with a bleed blockout?		If no, install a bleed blockout to ensure that unnecessary bleed does not occur during chemical dosing.
Does the cooling water system have a side stream filter that uses water for back flushing purposes?		If yes, consider capturing the bleed off in a backwash holding tank and then using it to backwash the side stream filter.

	Yes/No	Recommended action
Have you contacted your water treatment contractor to discuss increasing the cycles of concentration in your cooling tower to reduce the bleed rate?		If no, ask your contractor to do so. Water supply in Sydney should be able to be cycled to about 9. If your contractor is unable to do this, discuss opportunities of changing to a treatment system that can function effectively at high cycles of concentrations.
Does your cooling tower water treatment contract require the contractor to report back on all water leaks after each service?		If no, amend contract to ensure this occurs.
Do you have a certificate stating that an effective process of disinfection is installed and operating?		If no, make sure your contractor can supply one. These certificates are mandatory in NSW.
Cooling systems and building design		
Have you integrated economy cycle or fresh air venting into your air conditioning system?		If no, investigate if this can be done with your current HVAC equipment.
Have you reduced the heat load in your building as far as possible?		If no, install energy efficient lighting, building insulation, external shading, high performance insulation, sympathetic landscaping, and heat efficient natural lighting.
Is your cooling load under 500 kWR?		If yes, you should investigate the possibility of air cooled systems. In smaller systems, air cooled systems can be appropriate because they do not consume water and have lower maintenance costs.
Have you looked at alternative water sources for your cooling system?		Lake water, groundwater, sea water, reclaimed water, recycled water, rainwater and condensate may all be used in cooling systems.
Have you considered other cooling systems?		If no, investigate options including evaporative pre-cooled air cooled condensers with pad or spray cooling, variable refrigerant volume systems, hybrid coolers or condensers, phase change materials or chilled beam technology. These are viable alternatives to traditional cooling towers and should be investigated when building or renovating.
Kitchens and food courts		
Are the water supply lines to kitchens submetered?		If no, install sub meters on the supply lines to food businesses, especially high volume, water intensive kitchens.
Do you benchmark water use in each of the kitchens or your food court?		If no, use submetering information to establish benchmarks so you can track kitchen water use over time. Common benchmarks are litres per cover, litres per meal served, or litres per patron.
Do you have flow regulators on kitchen sinks and basins?		If no, install 9 or 12 litres per minute flow restrictors on kitchen sinks and 6 litres per minute restrictors on hand basins.

	Yes/No	Recommended action
Do you have waterless woks in your kitchen?		If no, consider installing a waterless wok. You may be able to get information and financial assistance from the Ethnic Communities Council of NSW. If you are accepting new tenancies into your food court, make the installation of waterless woks a lease condition.
Do you have a water efficient dishwasher?		If no, replace your existing model with a water efficient model. You will save money through water and energy savings.
Do staff in food courts and kitchens operate dishwashers and glass washers efficiently?		If no, ensure all staff receive information about water efficient dishwasher operation. If you are accepting new tenancies, make installation of water efficient dishwashers and glass washers a lease condition.
Do staff in food courts and kitchens rinse plates before washing?		If yes, install water efficient 6 litres per minute WELS rated pre-rinse spray valves. Sydney Water is offering a rebate system for their installation.
Do you check the condition of pre-rinse spray valves?		If no, inspect pre-rinse spray valves every 2 weeks to check for leaks and worn valves. Worn valves waste water and reduce cleaning efficiency.
Do staff in food courts and kitchens leave taps running while they are cooking and cleaning?		If yes, install signs to remind staff to turn taps off. Consider installing sensor taps or foot-operated taps. Waterless woks have hip controls and automatic turn off swivel taps.
Are kitchen floors and food court areas hosed down?		If yes, consider using mops or squeegees instead of hoses. Microfibre mops are highly water efficient. If hoses must be used, ensure they are fitted with trigger nozzles.
Is food ever defrosted under running water?		If yes, ensure all food is defrosted in a refrigerator, or in a microwave if it is to be cooked immediately.
Are water cooled steamers used?		If yes, install more efficient steamer equipment. Efficient steamers can use up to 90% less water and up to 60% less energy than older models and have shorter cook times, higher production rates and reduced heat losses.
Do tenants pay for their own water consumption?		If no, you may be able to establish leases so that submetering information can be used to charge tenants for their water consumption. This gives each tenant a financial incentive for water conservation.
Fitness centres		
Does your building contain a fitness centre?		If yes, continue with this section. If no, go to the next section of this checklist.
Are the showers water efficient?		If no, install 9 litres per minute flow restrictors or WELS 3-star rated showerheads on showers.
Do you have flow regulators in all hand basins?		If no, install flow regulators so that flow is reduced to 6 litres per minute or less.

	Yes/No	Recommended action
Does the fitness centre contain a swimming pool?		Ensure you submeter supply and refer to the Sydney Water fact sheet *Swimming pools* for benchmarking and water conservation information.
Outdoor areas and water features		
Do you have a landscaped area or water features?		If yes, continue with this section.
Do you submeter your irrigation supply and water features?		If no, consider installing submeters to determine your water use and identify leaks. This is especially important if you have large areas of irrigated areas or large water features.
Do you improve your soils?		Improving soil quality can improve plant growth and water retention. Add organic matter such as compost or composted animal manure.
Do you use an alternative water source to irrigate your garden?		If no, consider using rainwater, stormwater or treated wastewater for irrigation.
Cleaning		
Do you communicate with cleaning staff regularly?		If no, cleaning staff will need information about water wise cleaning techniques and the correct way to clean specialised equipment such as waterless urinals. You could use Sydney Water EDC Business Program stickers, posters and fact sheets to communicate with staff.
Do cleaners hose down floors or carparks?		If yes, remember that water restrictions prohibit the hosing of hard surfaces. Use brooms or mops to clean floors, or use rainwater or other water sources if you must use the hose. In most large carparks, commercial street or footpath cleaning equipment can be used.

Source: *Best practice guidelines for water conservation in commercial office buildings and shopping centres*, Sydney Water 2007, www.sydneywater.com.au/SavingWater/InYourBusiness/

Worksheet 3.6C

Planning a water audit – scope of work checklist

This is an example only – adapt this worksheet to suit your organisation's requirements.
Source: Adapted from Sydney Water's Every Drop Counts Business Program.

	Include in audit? Yes/No
Objectives	
General objective – e.g. to carry out a comprehensive water efficiency audit to achieve the following:	
Identify current water usage patterns	
Benchmark water use against standard or best industry practices	
Describe the current hydraulics system and identify any deficiencies	
Identify water conservation opportunities (including reuse and rainfall capture)	
Document the extent of existing water efficiency, reuse and rainfall capture	
Recommend plumbing retro-fit and other water saving initiatives, demonstrating the costs and savings including payback period.	
General methodology	
To carry out a comprehensive water audit in an efficient manner that is least disturbing to the building/centre occupants, the audit may involve:	
On-site investigation to quantify water usage at each of the following:	
Amenities – toilets, basins, showers, urinals and kitchen fittings	
Air conditioning systems and cooling towers	
Cleaning and house keeping	
Grounds maintenance	
Fire Services	
Other water-using fixtures and equipment	
Review of owner's plumbing maintenance practices	
Leakage measurement through flow metering	
Review existing water meter size (for possible downsizing)	
Review building's water reuse arrangements (if any are in place)	
Specific measures:	
Meeting with Building Management to discuss audit, access to information, documentation and a walk-through of the building/centre	
Inspecting water services, meters, pumps, reservoirs, tanks and water fixtures throughout the building/centre	
Inspecting all relevant water services plans	
Obtaining water meter readings from the local provider for the past 3 years and assessing this information to determine usage trends	
Installing a pulse unit and data loggers for submeters (existing or specifically installed for audit)	
Installing acoustic flow meters to monitor flow profile and usage – at supply-to-main domestic storage and fire hydrant tanks; and at water-out-of-main domestic water tanks	

	Include in audit? Yes/No
Flow testing water fixtures throughout the building/centre	
Analysing data obtained to determine daily usage and base flows	
Installing people counters at entrances to support normalisation of usage data	
System modelling over X days to identify usage for various areas or equipment within the building/centre	
Assessing base flow in system and calculating water charges	
Identifying and assessing water saving options	

Managing waste and recycling

3.7

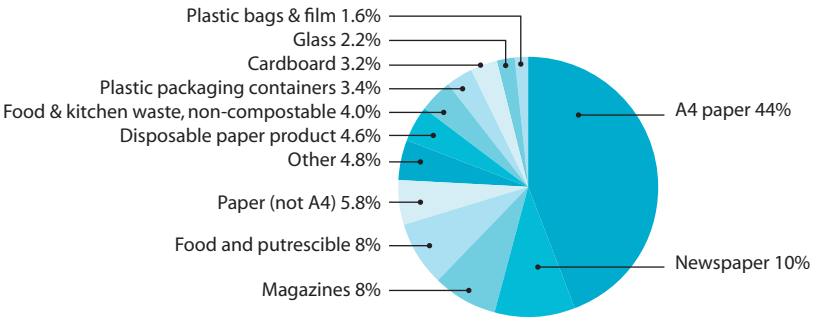
Context

More than 75% of all unwanted material generated in offices is paper or cardboard. Cardboard and packaging are also a significant proportion of the waste flow from a retail centre. Depending on the tenant mix, up to 40% of retail centre waste is organic and opportunities to divert this from landfill are increasing. For example, organic matter such as food waste can be diverted from landfill to alternate waste technology facilities such as Earthpower or UR3R. This means you have an excellent opportunity to divert a large proportion of your waste to recycling.

Having an effective waste and recycling system is a vital part of your sustainable building operations. Your waste and recycling system is a key interface between you and tenants, and tenants' participation in separating materials for recycling is critical to its success.

Achieving good recycling rates has a number of benefits, including:

- reducing running costs by avoiding landfill charges – in NSW the waste levy for the Sydney region and the Hunter, Central Coast and Illawarra will increase by $10 per tonne per year, indexed to CPI, from 1 July 2009 until 2015–16
- reducing your greenhouse gas emissions and hence your overall carbon footprint by minimising emissions from landfills and from extraction of new materials
- providing an excellent opportunity for you to work closely with your tenants and to help them save money by, for example, reducing waste through measures such as using less paper and reducing waste disposal costs.



Typical composition of waste and recyclables generated in Sydney offices 2006

Average of all systems.
Percentage by weight 'as received'.

What's in this section

Steps: Managing waste and recycling

1 Measure baseline performance

Gather information to establish baseline data for your waste and recycling infrastructure and current waste and recycling flows. You could use the waste and recycling review in Worksheet 3.7A as a guide. Gather the following information:

- What type of waste and recycling systems are already in place in tenancies and base building areas? Note the types of bins and waste handling equipment such as balers, compactors etc.
- Identify whether waste and recycling bins are available in high waste generating areas, e.g. photocopying and document preparation areas or food courts and retail tenant areas.
- Determine whether contamination in the recycling stream has been an issue, and if so, find out the details.
- Collate your current waste and recycling tonnes or volume. Will you be able to report performance data monthly?
- Find out whether contracts provide for reporting of waste tonnages.

Optimising your waste and recycling system is an ongoing process. You will need to make sure there are regular system checks (e.g. for contamination rates, signage and bin configurations and tenant participation) in order to keep tenant participation rates high. Actions resulting from your regular system checks can form the basis of your waste and recycling action plan (Step 4).

2 Benchmark performance

An important part of assessing your baseline performance is comparing your building's waste and recycling generation rates and recycling performance with others in the market. Use the NABERS Waste rating tool to benchmark your property (www.nabers.com.au). Under NABERS Waste, three types of ratings are available: a base building rating, a tenancy rating, and a whole building rating, which considers both the base building and tenancy performance.

When your building or portfolio is rated against the benchmarks, you need to ask:

- How does your building or portfolio compare?
- What percentage of your portfolio is below or above average?

Key things we know about waste and recycling in offices

- If you have a recycling system tenants generally will participate.
- Typical recycling rates range from 60–70% of waste generated.
- Within a tenancy, different people (depending on their job function) will be high generators of waste and low generators, but we know they are very consistent. The amount of waste generated and recycled by office workers 'week to week' is remarkably consistent.
- Offices with the highest amount of double-sided printing throw out less waste and use dramatically less paper.
- More waste appears to be placed in bins when each desk has a waste bin.

Department of Environment and Climate Change NSW

NABERS

About NABERS

NABERS is the National Australian Built Environment Rating System managed by the Department of Environment and Climate Change NSW. NABERS is a performance-based rating system which measures the operational environmental impacts of existing buildings.

NABERS office tools can be applied to three distinct situations:

- **Tenancy** ratings that cover the space occupied by a single tenant and under the control of that tenant
- **Base Building** ratings that cover all office spaces for that building, and measure the parameters that are under the control of the landlord or base building
- **Whole Building** ratings that are a combination of both Tenancy and Base Building for the situation where a tenant is the owner and/or has control of all services.

For more information see www.nabers.com.au

- Is this acceptable for the market positioning of your building or portfolio?
- What are the ramifications for obtaining and retaining environmentally aware tenants?
- What are the ramifications for the value of your asset?

Use the benchmarks to set improvement targets and to identify and prioritise properties that may need immediate action. See Section 3.4, Step 2, for more information about benchmarking using NABERS. Note that NABERS Waste is based on an amount of waste generated per person, therefore you will need accurate occupancy data (e.g. a computer count which represents the number of frequently used computers – not the number in the asset register.)

Self assessment

You can self-assess building environmental performance at no cost using the NABERS performance rating calculator (see www.nabers.com.au). The calculator is applicable to base buildings, tenancies and whole buildings.

Self-assessment can help you get a rough idea of performance, but you need to be careful that the information you enter is as accurate as possible and conforms to the data needed by the calculators.

For example, if you're using the base building waste calculator, the area should be based on the net lettable area (NLA) minus spaces that can be excluded such as retail areas in office buildings, and the data needs to relate only to the part of the building being rated, e.g. the base building. If the information you enter is not accurate the results can be misleading. If you are uncertain about self-assessment look for further information on the NABERS website or seek advice from a NABERS Accredited Assessor.

Accredited assessment

To ensure the accuracy of the results you obtain, and to use the rating to promote your property or organisation, or to use the NABERS trademarks, you must obtain a certified rating from a NABERS Accredited Assessor. Make sure you use an assessor with good knowledge of sustainability practices in both commercial property design and management. A list of assessors is available at www.nabers.com.au. An Accredited Assessor can also give you general advice or help you with an unofficial self-assessment.

DECC policy on bottled water

The environmental costs of bottled water (producing, transporting, refrigerating and disposing of the bottles) has led the Department of Environment and Climate Change NSW (DECC) to eliminate all non-essential purchasing of bottled water. The only bottled water purchased by DECC will be where there is an occupational health and safety requirement, such as for staff fighting fires, conducting fieldwork or working in remote locations without a reliable water supply. Staff can purchase their own bottled water, but are asked to think twice before doing so, and consider refilling bottles from the tap.

Australians spent $385 million on 250 million litres of bottled water in 2006 (AC Nielson). Tap water costs about $1 per cubic metre or 1,000 litres. Bottled water at $2.50 a 600 ml bottle costs over $4,100 a cubic metre. It takes a whopping 141,666 barrels of oil just to make the resin for the plastic bottles (Polyethylene Terephthalate or PET). Then another 314,465 barrels of oil are used to convert the PET to plastic bottles, fill the bottles, transport them and refrigerate the water. This much oil adds up to over 60,000 tonnes of CO_2 emissions. So every time you drink a litre of bottled water, you're using 200 ml of oil (Pacific Institute for Studies in Development, Environment & Security).

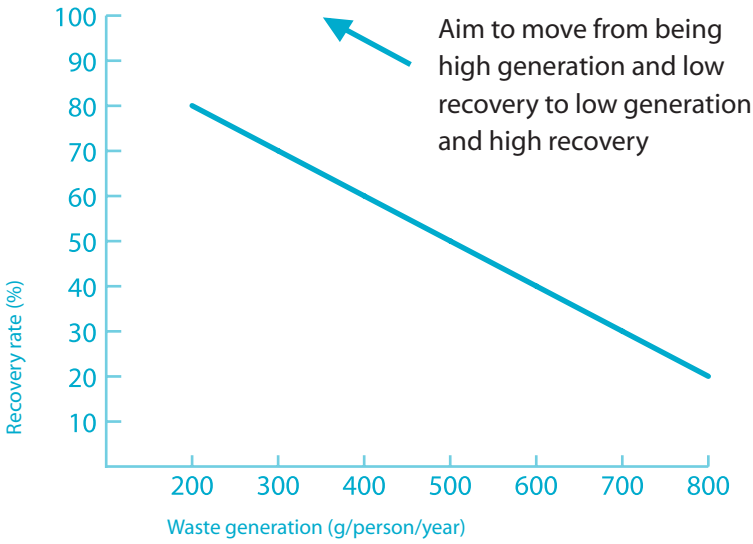
Only 35% of bottles actually make it to a recycling depot (Plastics and Chemicals Industry Association 2005–06 report). And for those bottles that are recycled, the recycling process uses another 1,600 barrels of oil each year.

Department of Environment and Climate Change NSW

3 Set performance targets

Set firm targets and milestones for reducing waste and optimising recycling. Targets should be twofold, relating to:

- reducing the overall amount of waste generated (total waste generated = waste to disposal + recycling)
- maximising the amount of material recycled.



You may wish to articulate your waste and recycling commitments and targets in a dedicated waste and recycling management policy or as part of your overall sustainability policy (See Section 2.3: 'Developing a sustainability policy for your organisation'.)

When setting targets ask the following questions:

- How do your targets compare with your peers in the market?
- Have you informed your internal and external stakeholders of the targets? Do the targets meet the stakeholders' current and future expectations?
- Can you verify progress in relation to the targets? Report your success rate back to staff to increase confidence that recyclables are being recycled.

Source or write articles for staff newsletters or email distribution that increase awareness of landfill issues and products produced from recycled materials.

Allocate responsibility for achieving the targets. Where applicable, integrate the targets and minimum standards into service or performance contracts with relevant service providers and staff performance agreements. Make sure your targets are not hidden in a report. Make them part of 'business as usual' operations. Promote targets to key stakeholders and ensure they understand the process you have committed to and the intended benefits.

Waste and recycling performance target examples

Examples of targets include:

- increasing the base building's NABERS Waste rating by 2 stars within a 12-month timeframe (be sure to set a specific date)
- increasing recycling rates to 80% of total waste generated
- reducing waste generation by 20%
- reducing contamination rates of recyclables to less than 2%
- increasing tenant participation in recycling to over 95% of building tenants.

Portfolio targets might include:

- achieving an average 4-star NABERS Waste rating across the portfolio by 2010
- achieving recycling rates of over 70%
- reducing waste generation by 20%.

Choosing a bin configuration

There are a number of recycling bin configurations available. To choose one that is appropriate for your situation you need to look at:

- what materials you want to collect e.g. paper-only, mixed paper including cardboard, co-mingled containers (drink bottles, aluminium cans), wet/dry systems (where putrescible waste is separated from dry material and recyclables)
- whether recycling materials will be separated on site by users, e.g. having paper-only bins, or using co-mingled bins which rely on off-site processing to separate materials
- the cleaning costs, e.g. emptying bins on a daily basis or less frequently.

Consider removing waste bins adjacent to desks and having a central recycling area. Research by the Department of Environment and Climate Change NSW shows that removing general waste bins can result in less waste being generated overall. Make sure materials separated for recycling in the office don't end up in the building's general waste dumpster.

4 Develop a waste and recycling action plan

Develop an action plan to improve your recycling performance and reduce waste generated within your building. The plan should identify responsibilities and timeframes for action. You could use Worksheet 3.7B as a guide.

Setting up a new waste and recycling system

If you don't already have a recycling system in place, work with your cleaners and waste contractors to set up your system.

- Identify the materials you want to divert and the materials accepted for recycling by your existing or potential waste contractors.
- Identify which system is best suited for the materials you want to collect, the types of tenants you have, how often bins are to be cleared (e.g. daily for putrescible waste) and how it will impact on your cleaning contract (e.g. number of bins to be collected daily)
- Ask your tenants if they have any special requests (e.g. secure destruction service) or if they have their own recycling programs in place (e.g. toner cartridge recycling). Look for opportunities to share services as this could reduce the number of trips collectors need to make to your building thereby reducing transport impacts.
- Identify high waste and recycling generation points to ensure that adequate recycling and waste bins are provided e.g. paper recycling in photocopy or utility rooms, organic waste bins in retail food preparation areas.
- Set up clear signage and instructions on how to use the system, including what can be recycled. You should be able to see the signage from at least 5 m away. Standard recycling signs can be found at www.environment.nsw.gov.au/warr/RecyclingSigns.htm
- All bins need to conform to AS 4123.7-2006: Mobile waste containers – *Colours, markings and designation requirements*.
- Educate your cleaners and tenants on how to use the system and don't forget to tell them about the benefits of being involved.
- Make sure the recycling gets recycled.

For more information see 'Waste Reduction in Office Buildings': www.environment.nsw.gov.au/sustainbus/buildingsandoffice.htm

Improving an existing system

To keep your existing waste and recycling system running at its optimum level, carry out regular checks:

- Encourage consistent separation of paper and cardboard from co-mingled recycling and general waste streams.
- Ensure correct bins, colour-coded bags and signage remains in place (at desks, kitchen areas, in shops or in food court areas).
- Identify non-participants or places where tenants have made changes to the system. Determine whether more education is required or if the system needs to be modified e.g. adding extra recycling bins.
- Identify any issues with collection and transfer of material to centralised areas and loading docks (e.g. avoid cardboard boxes piling up and blocking walkways).
- Identify opportunities to expand the range of material collected e.g. toner cartridges, mobile phones, fluorescent lamps and electronic waste. Arrange for regular clearance to suit the amounts collected. If tenants are already have their own programs in place, look for opportunities to collaborate in a building-based collection to help other tenants get involved and reduce overall transport impacts.
- Keep tenants up-to-date so they know about any system upgrades e.g. new materials that can be recycled, and so continuing problems can be addressed.

5 Collect data and monitor performance

Work with your cleaning and waste removal service providers to collect data by weight. Often waste and recycling data is provided as a volume measurement, or is based on frequency with a number of bin lifts per week. Converting volume to weight is often problematic due to the variable nature of waste and recycling, e.g. one empty cardboard box can fill half a 240-litre mobile garbage bin and weigh only a small amount. While weights may not be available in the short term, work towards a system where weight can be accurately reported at least monthly.

What do the terms mean?

- Total waste generation = waste sent to disposal + waste sent to recycling.
- Recycling rate = (material recovered – contamination) /total waste generation.

Sometimes there can be a difference between the amount of material you recover and how much is actually recycled. The recycling rate can be affected by:

- contamination rates – this is material that is not accepted for recycling in a particular recycling stream; for example, for source-segregated paper recycling this means any non-paper products (even if they are recyclable). Contamination can cost you money if your recycling load is rejected and sent to landfill
- the sorting efficiency of the recycling processing facility – for co-mingled recycling streams your recycling rate can be affected by the effectiveness of the recovery facility's sorting processes.

Carry out verification checks on the sorting facility your recycling materials are sent to, to make sure the materials are being diverted from landfill.

6 Update cleaning and operational procedures

Work with your cleaners to review cleaning and waste removal procedures and ensure that good recycling practices are part of everyday activities. Make sure cleaners and maintenance staff understand the waste and recycling system, including:

- which materials are accepted in each container and which are not (minimising contamination)
- which colour-coded bag to use (use of transparent bags for recycling helps cleaners identify contamination)
- which designated lift and storage areas to use.

Conducting waste and recycling audits

It's good practice to carry out waste audits to provide a detailed analysis of waste and recycling flows, the savings that can be made, and the cost of achieving those savings.

When planning your audits and assessments clearly identify the outcomes you want to achieve. For example, do you want to:

- Design your new recycling system? The audit should focus on identifying the material available for recycling.
- Check for contamination? Organise cleaners to carry out more regular system checks.
- Track your recycling and waste flows? Make sure it can be repeated regularly.
- Benchmark your property using NABERS Waste? You'll need to conduct your audit using the NABERS Waste protocol. Talk to a NABERS Assessor for more information, www.nabers.com.au.
- Verify the off-site sorting efficiency, i.e. the sorting efficiency of the recovery facility your recycling materials are sent to? A third-party auditor might be appropriate.
- Work out your carbon/ecological footprint? To calculate your greenhouse gas impacts you'll need to identify the amount and composition of waste going to landfill. Any material being diverted and recycled will not add to your greenhouse gas emissions.

For more information on how plan an office waste audit see *A WRAPP Guide to conducting an Office Waste Assessment*: www.wrapp.nsw.gov.au/education/WA_course/howtoguide0615.pdf

Regularly engage with cleaners to ensure they understand the importance of reducing waste and optimising recycling. Make sure all workers and contractors involved with cleaning and waste understand their responsibilities and know how to:

- collect recyclable material and keep it separate from the general waste stream
- keep waste storage and handling areas clean and tidy, without creating litter by allowing bins to overflow
- safely use waste handling equipment such as compactors, balers and bin lifting equipment.

Dealing with specific waste types

Office electronics, equipment and furniture

Set aside space for infrequent waste flows from office equipment (including electronic waste (e-waste) such as computers and televisions). Investigate opportunities for reuse through charities or auction houses or recyclers that specialise in e-waste. Refer to www.environment.nsw.gov.au/warr/ewaste.htm for more information.

Construction and demolition materials

Ensure waste and recycling material from retrofits and service contracts is well managed. For example, include appropriate provisions for waste and recycling management in construction contracts or service contracts. The provisions could include a requirement for an approved waste and recycling plan, or could specify recycling rates etc. Refer to www.environment.nsw.gov.au/warr/CnDWasteStream.htm for more information.

Hazardous and liquid wastes

Ensure any hazardous or liquid wastes such as waste oil, solvents, paints and other chemical wastes are appropriately managed. Undertake an assessment of the waste management practices you and your tenants such as drycleaners, photo processors, clinics and surgeries have for these wastes. For more information see the liquid waste factsheets at www.environment.nsw.gov.au/waste/liquidwastefs.htm

7 Update waste and recycling contracts

Review cleaning, waste and recycling contracts and set performance standards to ensure that accurate and regular (e.g. monthly) data can be collected. Build a monthly review into contracts to check the performance of the system. It's also a good idea to include regular tenant education on how to use the system as part of your cleaning, waste and recycling contracts.

Meeting an ambitious target for recycled or reused materials

While developing their new Sydney office, Stockland achieved an ambitious target of using 80% recycled or reused materials. For a new build this is not such a difficult achievement. However, for an existing building, where remaining tenancy furniture from more than ten different tenants on eight different levels had to be managed, this was a significant challenge. For example, although plasterboard offcuts can be recycled, painted plasterboard will not be accepted by any recycling operations.

'Specialist demolition contractors deconstructed the floorplate and recycled or onsold items. The builder sorted waste on site during the construction phase. Through a balance of working with suppliers and industry partners Stockland significantly reduced the waste output from a major construction site. When Stockland moved from their existing offices they applied similar principles, including managing to give most workstations away to Mission Australia. Stockland's office now diverts over 85% of waste from landfill.'

Stockland, www.stockland.com.au

Worksheets

- See Worksheet 3.7C for issues to address in a waste collection contract.
- See Worksheet 3.7D for model clauses that can be included in cleaning contracts.

8 Report performance monthly

Include waste and recycling management in regular base building reporting. Report monthly so you can track and understand variations or unusual events such as tenant clean-outs. An example of a monthly review is provided in Worksheet3.7A.

Include performance monitoring results in your monthly property sustainability report Use Worksheet 3.4C as a guide or adapt it and integrate it into your existing monthly reports.

Highlight steps that need to be taken to improve performance and progress towards meeting your targets.

9 Engage tenants

Regularly engage with your tenants to support them in reducing waste and optimising recycling. Keep them up-to-date on the performance improvements you are working on. Some tenants may be entirely unaware of the waste they create and hence have no drivers to encourage diverting material to recycling.

Encourage tenants to adopt waste avoidance methods such as double-sided printing. DECC research shows that offices with high doubled-sided printing rates have lower waste generation rates. It is also important to close the recycling loop and encourage the purchase of recycled content paper – the higher the better. Other ways to reduce waste include encouraging tenants to:

- think before they print – do all emails need to be printed?
- use reusable mugs, crockery, bottles and glasses (many coffee shops provide a discount to users)
- provide filtered water and reduce the reliance on bottled water (see sidebar on page 3 of this section)
- reduce the number of plastic bags they use
- think of other ways to reduce their waste through purchasing strategies such as reusable packaging.

See Section 3.3: 'Tenant engagement and green leases' and Section 5: 'Sustainability and the Supply Chain' for more information.

10 Review performance annually

Review and report your waste and recycling performance on a yearly basis too. How have you progressed against your targets? What can you do over the next 12 months to improve performance?

Include waste and recycling in your Annual Resource Efficiency Performance Review. Section 3.4 and Worksheet 3.4D provide more detail and a template for this.

Greater awareness after refurbishment

'While many tenants are implementing effective office waste recycling schemes, excessive amounts of recyclable material are still finding their way into landfills.

The Direct Property Investment Fund (DPIF), one of the unlisted property funds within Colonial First State Global Asset Management, used a major building refurbishment as the vehicle to introduce a new recycling system. After a situation appraisal through on-site audits, managing agents Colliers International, in collaboration with cleaners, waste removal companies and tenants, introduced a new recycling system focused on paper, cardboard and recyclable containers.

After a short promotion campaign the results have been outstanding, with the overall recycling rate increasing from 32% to 62% over a 6-month period. The diversion of 67 tonnes of waste from landfill is equated to saving 107 tonnes of greenhouse gas emissions, 874 trees, 188 barrels of oil, 275,632 kWh of electricity or 2.13 ML of water. The next step is an organics waste recycling initiative.'

Colonial First State Global Asset Management, www.cfsgam.com.au

Environmental benefits of recycling

A 'Benefits of Recycling' study found that, by recycling, each year NSW households are saving 2,654 Olympic-sized swimming pools of water, the annual electricity requirements of almost 334,000 households and taking 55,000 cars off the road permanently. For more information see www.environment.nsw.gov.au/warr/BenefitRecycling.htm

Public reporting of your performance is critical to ensuring accountability and a positive corporate reputation among your stakeholders. Your annual review and report should include official, accredited NABERS ratings (see www.nabers.com.au for more information). This gives stakeholders confidence that the reported standards are reliable, and that you are committed to achieving the targets you have established.

Update your waste and recycling action plan once you have completed each annual review.

Further information

- *ESD Design Guide for Office and Public Buildings*, Edition 3, Department of the Environment, Water, Heritage and the Arts, May 2007, www.environment.gov.au/settlements/publications/government/esd-design/index.html
- Department of Environment and Climate Change, www.environment.nsw.gov.au/waste/ and the 'Benefits of Recycling Calculator', www.environment.nsw.gov.au/warr/BenefitRecycling.htm
- *Know your printing paper: A guide to purchasing recycled content printing paper for corporate stationery and promotional materials*, www.environment.nsw.gov.au/sustainbus/officewasteguides.htm
- NABERS Waste, www.nabers.com.au
- Waste Reduction and Purchasing Policy, including the *WRAPP Guide to Conducting an Office Waste Assessment,* www.wrapp.nsw.gov.au/
- *Waste Reduction in Office Buildings – A Guide for Building Managers*, Resource NSW 2002, www.environment.nsw.gov.au/sustainbus/buildingsandoffice.htm
- NSW Waste Avoidance and Resource Recovery Strategy 2007, www.environment.nsw.gov.au/warr/WARRStrategy2007.htm
- Recycling signs, www.environment.nsw.gov.au/warr/RecyclingSigns.htm
- E-waste, www.environment.nsw.gov.au/warr/ewaste.htm
- Construction and demolition waste, www.environment.nsw.gov.au/warr/CnDWasteStream.htm
- Liquid waste, www.environment.nsw.gov.au/waste/liquidwastefs.htm

Worksheets

Review and use these Word documents:

3.7A Property waste and recycling review

3.7B Waste and recycling action plan

3.7C Waste collection contract checklist

3.7D Clauses for cleaning, waste and recycling contracts

Using contracts to support waste reporting

'Until recently, waste and recycling data collection has been a low priority for building managers, and so property owners have had little information to from which to measure potential sustainability initiatives.

The Direct Property Investment Fund (DPIF), one of the unlisted property funds within Colonial First State Global Asset Management, has overcome this by developing an enhanced cleaning and waste service contract on three buildings in Sydney, totalling 43,000 m^2 NLA. Through a revised cleaning tender, incorporating waste management reporting requirements as part of the contractual obligations, detailed information on waste streams has become available. Previously there was little or no quantified information. Accuracy has improved by an order of magnitude.

The benefits are significant:

- Cost of new cleaning contracts has reduced 7% yet there have been significant increases in waste collection and recycling.
- There is now credible base data which can be used to benchmark new tenant waste minimisation and recycling initiatives.'

Colonial First State Global Asset Management, www.cfsgam.com.au

Know your printing paper

Published by DECC, *Know your printing paper: A guide to purchasing recycled content printing paper for corporate stationery and promotional materials* is a guide to help printers, graphic designers and their customers to choose recycled printing paper. It lists all recycled content printing paper available for corporate stationery and promotional materials, along with paper specifications, characteristics and environmental labels. The guide also discusses the environmental benefits of recycled paper manufacture and describes the meaning of labels and certifications.

www.environment.nsw.gov.au/sustainbus/officewasteguides.htm

Worksheet 3.7A

Property waste and recycling review

This is an example only – adapt this worksheet to suit your organisation's requirements.

Property or retail centre name and address:		
Review date:	Reviewer:	Approved by:
Floors and tenancies audited:		
No. of occupants (e.g. for an office, a computer count)		
Current cleaning/waste contractors (1):		Contact name: Phone/fax:
Current cleaning/waste contractors (2):		Contact name: Phone/fax:

Item	*Yes/No/NA*	*Comment/Action required*	*Action #*
Waste and recycling action plan			
Is there an approved Waste and Recycling Action Plan (WRAP) or similar being implemented?		See Worksheet 3.7B for Waste and Recycling Action Plan template	
Is there an induction program for new tenants, cleaners and contractors to help them understand the waste and recycling management system?		(As a minimum, incorporate into an induction procedure an understanding of the waste and recycling system and responsibilities in regard to appropriate materials handling.)	
Cleaning and waste contract			
Do current cleaning and waste contracts provide for separation of recyclables? If so, list the recyclables collected.		Update contracts to include recycling, or expand the range of materials collected for recycling e.g. paper, cardboard, organics, co-mingled containers, toner cartridges etc. (See Worksheet 3.7C for an outline of issues to address in new waste and recycling contracts.)	
Do current cleaning and waste contracts require regular reporting of waste and recycling flows? If so, is the data reported by weight or volume?		Update contracts to include monthly reporting of waste and recycling data (by weight where possible).	
Are the relevant specific responsibilities of the cleaning and waste contractors being implemented satisfactorily? If not, list non-conformances.		Work with contractors to improve performance.	
List observations on the execution of tenants' waste contracts (where applicable) e.g. container management, signage, odour and litter.		Work with tenants and tenants' contractors to improve handling of waste and recycling.	
Tenancy waste facilities			
Answer these questions in conjunction with the following Tenancy waste and recycling configuration			
Is signage on tenant waste and recycling bins visible and appropriate?		(Note bin locations where new signage or new recycling containers are required.)	

Item	*Yes/No/NA*	*Comment/Action required*	*Action #*
Are recycling bins missing and needing replacing?		Identify number and location of containers to be replaced	
Are individual and centralised waste and recycling bins being used as intended?		(Describe any modifications made by user i.e. introduced extra bins. If impacting on the system then raise with tenant.)	
Are recycling bins located in areas of high waste generation, e.g. paper recycling in photocopy rooms, containers in staff kitchens, organics in food prep. areas, paper towels in bathrooms?			
Identify the level of contamination in the individual and central recycling bins (as a %). Note typical and major contaminants in each stream (e.g. food).		(Low, moderate but acceptable, unacceptable [1])	
Is the contractor using the required bag colour?		(Consider using transparent bags for recyclables to allow contamination and recyclables to be easily identified.)	
Are the right bags going into the right trolleys?		Work with cleaners to ensure recycling is not mixed with general waste.	
Other observations:			

Tenancy waste and recycling configuration

Describe tenant recycling bin configuration	*Describe size and number of containers*	*Frequency of collection*	*Observations/ Contamination issues*	*Actions/Improvements*
Office areas: Under-desk general waste bin				
❑ General waste	e.g. 20 L waste bin with black waste bag	e.g. cleaner empties daily into black bags		
❑ No waste bin (recycling only)				
❑ Wet waste				
Office areas: Under-desk recycling container				
❑ Paper only	e.g. cardboard box at each desk	e.g. tenant empties as required to centralised bin	e.g. missing recycling boxes	e.g. replace 6 missing recycling boxes on Floor A
❑ Mixed paper: newsprint, cardboard, magazines				
❑ Co-mingled containers				
❑ Co-mingled containers plus mixed paper				
❑ Dry waste				

[1] Unacceptable – high probability that recycling collector or recycling treatment process will reject the load. Refer back to waste management plan allowable contamination rates.

Describe tenant recycling bin configuration	*Describe size and number of containers*	*Frequency of collection*	*Observations/ Contamination issues*	*Actions/Improvements*
Office areas: Centralised recycling bins				
❑ General waste				
❑ Paper only				
❑ Mixed paper – newsprint, cardboard, magazines				e.g. improve signage on centralised bins, add extra recycling bin in photocopy room
❑ Co-mingled containers				
❑ Co-mingled containers plus mixed paper				
❑ Secure waste				
❑ Dry waste				
Office kitchens, bathrooms etc.: Centralised bins				
❑ General waste				
❑ Mixed paper – newsprint, cardboard, magazines, paper towels				Note: paper recycling streams can be subject to high contamination in kitchen areas therefore sometimes better to limit to paper towel recycling only.
❑ Paper towel				
❑ Co-mingled containers				
❑ Co-mingled containers plus mixed paper				
❑ Organic waste				
❑ Wet waste				
Other centralised recycling:				
❑ Loose cardboard	At lift			
❑ Toner cartridges	In all utility rooms			
❑ Mobile phones	At reception			
❑ Batteries	At reception			
❑ Reusable stationery				
❑ Other (internal cafés, child care facilities, gyms etc.) Describe system and bin configuration				
Retail areas: General retail tenants				
❑ General waste				
❑ Cardboard				

Describe tenant recycling bin configuration	*Describe size and number of containers*	*Frequency of collection*	*Observations/ Contamination issues*	*Actions/Improvements*
❑ Co-mingled containers				
❑ Co-mingled containers plus mixed paper				
❑ Organic waste				
❑ Wet waste				
❑ Mixed cardboard, paper, magazines				
❑ Other: (e.g. coat hangers)				
Retail areas: Food court tenants				
❑ General waste				
❑ Cardboard				
❑ Co-mingled containers			If co-mingled, list recyclables accepted	
❑ Glass bottles				
❑ Plastic containers				
❑ Aluminium and steel cans				
Retail areas: General areas and food court				
❑ General waste				
❑ Cardboard				
❑ Co-mingled containers			If co-mingled, list recyclables accepted	
❑ Glass bottles				
❑ Plastic containers				
❑ Aluminium and steel cans				
❑ Other:				
Retail areas: Major tenants				
❑ General waste				
❑ Cardboard				
❑ Other				
Detail specialist waste streams (e.g. solvents from drycleaners etc.) and responsibility for their management.				
Other:				

Describe tenant recycling bin configuration	*Describe size and number of containers*	*Frequency of collection*	*Observations/ Contamination issues*	*Actions/Improvements*

Item	*Yes/No/NA*	*Comment/Action required*	*Action #*
Transfer of waste and recycling to base building handling areas			
Is cleaners' access to transfer bins via a specific route e.g. goods lift?		Ensure waste handling procedures clearly describe collection and access to minimise tenant disturbance especially if office hours cleaning is undertaken.	
Are access-ways adequate for the size and type of bins being used?		Can any improvements be made if corridors or lifts are not of adequate size, e.g. smaller bins collected more often?	
Do tenants with their own services (e.g. secure paper) use the same access route? Any issues?		Work with tenants to develop procedures to reduce disturbance from transferring bins to centralised waste handling and storage areas.	
Waste and recycling handling areas/compound			
Answer these questions in conjunction with the 'Base building recycling and waste form' (see page 8).			
Are waste and recycling bins handling areas appropriately located and of adequate size?		If handling areas are under-capacity consider more frequent collections.	
Are waste and recycling bins or containers colour-coded, signposted and properly used?		Ensure signage can be viewed at least 5 m away.	
Are the correct bags being placed in the correct containers?		Consider colour coding bin floor areas to ensure that recycling and waste bins are not confused.	
Are waste and recycling bins and handling areas being maintained as required?		Keep waste handling areas clean and tidy to encourage proper use of the area. If bins are constantly overflowing, investigate options for compactors or cardboard balers to reduce bulk.	
Are waste and recycling bins adequately covered?		Ensure bins are secure and rainwater etc. cannot access bins.	
Is there provision for regular bin washing? Who is responsible for washing bins e.g. contractor?		If washed on-site ensure bin washdown area is connected to sewer.	
Is there adequate access and storage for tenant secure paper bins or specialist recycling services such as toner cartridges, computers, e-waste, batteries, paints, solvents, fluorescent tubes etc.			
Is there space for furniture and other reusable equipment or a strategy to send to reuse options (e.g. charities) rather than disposal?			
Are there any hazardous or classified wastes in any waste or recycling containers?		Keep classified waste in a separate secure area.	

Item	*Yes/No/NA*	*Comment/Action required*	*Action #*
Does the waste handling area have adequate bunding and connection to sewer?		If storing waste liquids see DECC bunding and spill management guidelines (www.environment.nsw.gov.au/water/bundingspill.htm)	
Are measures in place to ensure secure paper bin storage and collection is adequately secure?			
Are building contractors required to have a construction and demolition waste management plan?		Make sure building contractors understand the waste and recycling system and don't contaminate recycling streams.	
Is there adequate access for collection vehicles?		If no access, ensure that provisions are made to avoid littering or blocking access to your building or to the public.	
Is your waste collection and handling impacting on your neighbours, e.g. blocking roads or creating litter, noise?		Work with contractors and cleaners to identify remedial measures.	
Is there an odour problem?		Work with contractors and cleaners to identify remedial measures. If a large amount of organic waste is stored, investigate different container options or more frequent collections.	
Is there a moderate to significant litter problem in this area?			
Waste records			
Is the approved cleaning and waste contract specification available for view?			
Are waste streams being measured and recorded in volumes and weights?		Work with contractors to implement weight-based reporting.	
Are weekly/monthly waste records available?			
Is weekly/monthly waste data being provided by weight? If so, is data being converted from volume or weighed? What conversion factor is being applied?			
Have all monitoring reports been received and filed?			
Have all weighbridge dockets been received and filed?			
Are all waste and recycling related management requirements as set out in the contract being adequately addressed?			

Other observations:

Performance conclusion		
Total wet/putrescible waste removed from floors/area (average amount/floor) kg	Total recyclable waste streams removed from floors/area: (average/floor) Paper/cardboard kg Co-mingled kg	Total diversion from landfill: _____ % of total waste _____ (kg)
Does the evidence suggest the Waste and Recycling Action Plan and/or waste contract provisions are effective? Explain.		

List key remedial/corrective actions required:

Action #	
Action #	
Action #	
Action #	
Action #	
Action #	
Action #	

End of audit

Base building waste and recycling form

Item	*Describe collection receptacle* *e.g. 120 L MBG*	*Material handling* *(container, tenant or cleaner handles)*	*Management option* *(e.g. sent to recycling or disposal)*	*Contractor details*	*Disposal/recycling facility details*	*Amount tonnage:* *kg/month or tonnes/year*	*Material tracking proof or evidence:* *documents, third party verification?*	*Action required*
❑ Paper		e.g. paper transferred in 240 L MBG	Collected in 240 L MGB for recycling					
❑ Cardboard								
❑ Mixed paper/ cardboard/ magazines								
❑ Co-mingled containers (describe items accepted)							e.g. receipts and facility sorting efficiency estimated provided	Investigate reporting of data
❑ Co-mingled containers with paper (describe items accepted)								
❑ Secure paper			e.g. destruction and recycling	e.g. tenant's contractor details	e.g. tenant contactor			
❑ Organic (e.g. food waste and garden)								
❑ Toner cartridges								Identify number of tenants with their own service. Look for opportunities for base building contract to reduce transport impacts.
❑ Mobile phones								Set up mobile muster collection program (www.mobilemuster.com.au)
❑ Batteries								

Item	*Describe collection receptacle e.g. 120 L MBG*	*Material handling (container, tenant or cleaner handles)*	*Management option (e.g. sent to recycling or disposal)*	*Contractor details*	*Disposal/recycling facility details*	*Amount tonnage: kg/month or tonnes/year*	*Material tracking proof or evidence: documents, third party verification?*	*Action required*
❑ Fluorescent lamps and compact fluorescents								Designate storage area for used lamps and arrange for recycler to collect
❑ Electronic waste (e.g. computers, printer etc., televisions								Investigate reuse opportunities with charities
❑ Furniture								Investigate reuse opportunities with charities
❑ Other								
❑ General waste								
❑ Wet waste								
❑ Dry waste								
Retail:								
❑ Cardboard								
❑ Paper								
❑ Plastic wrap								
❑ Glass								
❑ Aluminium cans								
❑ Steel cans								
❑ Plastic containers: list plastic types collected (PET, HDPE, etc.)								
❑ Co-mingled containers: list materials collected (e.g. glass, plastic, cans)								
❑ Plastic strapping								

Item	*Describe collection receptacle e.g. 120 L MBG*	*Material handling (container, tenant or cleaner handles)*	*Management option (e.g. sent to recycling or disposal)*	*Contractor details*	*Disposal/recycling facility details*	*Amount tonnage: kg/month or tonnes/year*	*Material tracking proof or evidence: documents, third party verification?*	*Action required*
❑ Coat hangers								
❑ Waste oil								
❑ Grease trap								
❑ Organic (food and garden)								
❑ Other:								

Worksheet 3.7B

Waste and recycling action plan

This is an example only – adapt this worksheet to suit your organisation's requirements, and review your plan on an annual basis.

Property name:		
Address:		
NLA or GLA of building (m^2):		
Date:	Prepared by:	Approved by:
Key contractors for the following services:		
Cleaning:	Specialist recycling contractors:	
Waste removal:	Liquids (e.g. waste oil):	
General recycling contractors:	Fluorescent lamps:	
Organics (e.g. food waste):	Other (e.g. toner cartridges, batteries, mobile phones):	
NABERS Waste rating:		

Waste generation targets for financial year

Waste stream *(adapt this for your waste stream)*	Monthly target (kg or tonnes)	Annual target (kg or tonnes)	Contamination % [1]	Method of disposal and contractor
Putrescible waste				
Paper (unsecure)				
Paper (secure)				
Cardboard				
Co-mingled plastics				
Green waste				
Food waste				
Cooking oils				
Other:				

[1] Contamination % subject to confirmation by Waste Collection Contractor

Short-term opportunities

(Actions with a payback of typically less than 3 years)

	Actions or initiatives to be taken to achieve targets or reduce waste generation, contamination levels etc.	Responsibility	Expected waste savings (kg)	Cost to implement	Payback period or internal rate of return	Time required to implement	Planned completion date	Actual completion date
	Cleaning and waste contracts and waste records							
	Tenancy waste facilities							
	Transfer of waste and recycling to base building handling areas							
	Waste and recycling handling areas/compound							

Summary for short-term opportunities

Total waste savings (kg):
Total recycling achieved (kg)
Total recycling as percentage of total waste generated (%)
Total cost savings as a % of total cost

Sign: Sign:

Date: Date:

Medium-term opportunities

(Actions with a payback of typically between 3 to 5 years, often with other benefits too.)

	Actions or initiatives to be taken to achieve targets or reduce waste generation, contamination levels etc.	Responsibility	Expected waste savings (kg)	Cost to implement	Payback period or internal rate of return	Time required to implement	Planned completion date	Actual completion date
	Cleaning and waste contracts and waste records							
	Tenancy waste facilities							
	Transfer of waste and recycling to base building handling areas							
	Waste and recycling handling areas/compound							

	Actions or initiatives to be taken to achieve targets or reduce waste generation, contamination levels etc.	Responsibility	Expected waste savings (kg)	Cost to implement	Payback period or internal rate of return	Time required to implement	Planned completion date	Actual completion date

Summary for medium-term opportunities

Total waste savings (kg):					
Total recycling achieved (kg)					
Total recycling as percentage of total waste generated (%)		Sign:		Sign:	
Total cost savings as a % of total cost		Date:		Date:	

Long-term opportunities

(Actions with a payback of typically more than 5 years, but with other significant benefits too such as improved maintenance and conditions.)

	Actions or initiatives to be taken to achieve targets or reduce waste generation, contamination levels etc.	Responsibility	Expected waste savings (kg)	Cost to implement	Payback period or internal rate of return	Time required to implement	Planned completion date	Actual completion date
	Cleaning and waste contracts and waste records							
	Tenancy waste facilities							
	Transfer of waste and recycling to base building handling areas							

	Actions or initiatives to be taken to achieve targets or reduce waste generation, contamination levels etc.	Responsibility	Expected waste savings (kg)	Cost to implement	Payback period or internal rate of return	Time required to implement	Planned completion date	Actual completion date
	Waste and recycling handling areas/compound							

Summary for long-term opportunities

Total waste savings (kg):	
Total recycling achieved (kg)	
Total recycling as percentage of total waste generated (%)	
Total cost savings as a % of total cost	

Sign:		Sign:	
Date:		Date:	

Worksheet 3.7C

Waste collection contract checklist

A waste or recycling contract should include the following information. The contract agreement should make it clear whether any extra costs will be associated with any waste or recycling activities. This is an example only – adapt this worksheet to suit your organisation's requirements.

For further information see *Waste Reduction in Office Buildings, A Guide for Building Managers*, available at www.environment.nsw.gov.au/sustainbus/wastereductioninofficebuildings.htm

Provision of service

Scope of the service required, including container sizes (garbage and recycling) and frequency of collection and service level and fees associated with each. Fees may be charged for containers considered over-full.

Recycling assurance

Where materials have been separated for recycling by the tenant or cleaners, the service provider will make all reasonable efforts to ensure the material is recycled according to its highest resource use.

Contamination penalty

The client agrees to pay a penalty clause for contamination in the recycling containers on a condition that the service provider can provide documented evidence of continual contamination above agreed levels. Agreed levels should be stated in the contract and in part related to maximum levels accepted by the receiver of the recycling material e.g. the re-processor. This penalty will allow the client to enforce improved practices by tenants or cleaners.

Flexibility

The client reserves the right to review the number and size of containers for waste and recycling every 3 months. The service fee will be altered to reflect the change of service according to agreed costs. This will allow alteration of the proportion of garbage to recycling containers should recycling rates increase or decrease.

Collection times

All waste and recycling will be collected between the hours of [9 pm] and [6 am]. Client to determine collection times that suit building occupancy patterns.

Non-scheduled pick-ups

The service provider should make non-scheduled collections of waste and recycling as requested by the client based on an agreed schedule of fees.

Collection point

The client will be responsible for placing the waste and recycling bins at an agreed collection point. Note the likelihood of an additional fee for the waste contractor to enter the building (e.g. loading dock area) or to travel an excessive distance from the truck to container.

Maintenance

Identify cost of repairs to containers where damage is caused by the client (or cleaners). Identify who is responsible to clean waste and recycling containers.

Bin stickers

Waste contractor to ensure all waste and recycling containers are appropriately and clearly labelled included labelling on lids, front side and rear.

Reporting

Monthly reports to the client on quantity of each waste and recycling stream collected in tonnes. Frequent reports on the composition of the recycling stream should also be provided.

Worksheet 3.7D

Clauses for cleaning, waste and recycling contracts

The following inserts may be suitable for inclusion in new cleaning, waste and recycling contracts tendered for office properties. This has been adapted from the original text by Colonial First State Global Asset Management. This is an example only – adapt this worksheet to suit your organisation's requirements.

Conditions of tendering

Performance objectives

Include as an additional objective: 'A reduced impact on the environment through a commitment to sustainability and environmentally sound systems of resource recovery.'

Performance benchmarks

Include the following KPIs:

Key performance indicator	Performance level	Measurement/comments	Source of data
Regulatory compliance	100%	No formal infringement or penalties associated with any relevant environmental or safety regulation, by-law etc.	Contractor and/or subcontractor
Verification of recycling	95%	Provision of accurate and comprehensive information on building recycling performance on at least a monthly basis.	Waste Contractor receipts, weighbridge receipts, Contractor records.
Principal's audits	No significant non-compliance	Minor non-compliances rectified within 5 days.	Audit report

Terms and conditions

1.0 Statutory obligations and safety and environmental compliance

The Contractor shall, in the execution and performance of the service required by this agreement, comply with all statutes, regulations, ordinances, by-laws and requirements of all competent authorities which relate to or affect the service.

The Contractor shall take all reasonable and proper safety and environmental precautions to prevent death or injury to any person or damage to any property in or near the property. In particular, all equipment and cleaning materials used by the Contractor shall be used in a manner and maintained and stored so as to prevent unauthorised use or misuse thereof and to minimise the danger of accident, spills, injury or loss arising from the use of such items.

1.1 Preparation of Environmental Management Plan

The Contractor must have an Environmental Management Plan that complies with ISO 14001:2004 and that details the impact of its service delivery on the environment and measures to improve environmental performance and management.

A draft of the Contractor's Environmental Management Plan must be submitted at least 1 month prior to the Services Commencement Date.

The Landlord may direct that the Contractor make any amendments to the Environmental Management Plan that it considers appropriate. However, non supply of comments does not relieve the Contractor of the responsibility for the Environmental Management Plan and its implementation.

1.2 Review of Environmental Management Plan

The Contractor must review the Environmental Management Plan annually and advise when the review has taken place. Any amendments to the plan must be submitted and any such review must be to the satisfaction of the Landlord.

2.0 Storage

The landlord will provide a dedicated area within the property for temporary storage of segregated waste materials for collection by the waste removal contractor/subcontractor. The contractor is to confirm that the waste handling area is, and remains, of sufficient size and location to enable effective removal of recyclable and residual waste from the subject property.

3.0 Specifications for mobile bins

Unless otherwise agreed with the Landlord, mobile bins used in the performance of services must conform to the following specifications:

- comply with AS 4123: 2006 *Mobile waste containers*
- be coloured coded as detailed in the particular service specification
- contain a minimum of 30% post-consumer recycled Australian content
- where reasonably possible, be made in Australia
- be hot stamped with individual identification serial numbers
- be labelled with high quality stickers to identify materials, using the standard signs and symbols recommended by the Department of Environment and Climate Change NSW, and
- may contain bar coding, embedded passive chip systems or RFID where these devices are used by the Contractor to improve collection service, for data gathering, monitoring and reporting.

The Contractor must retrieve all damaged bins, or bins no longer required, at any location and either:

- recycle them where it is practicable
- dispose of them where a practicable recycling option is not available, if they are damaged beyond repair, or
- repair them and store them at the Contractor's depot for re-issue to locations as required.

3.0 Cleaning materials

The Contractor shall submit details of all cleaning and polishing materials and equipment intended to be used in the performance of the work. Those details shall include Material Safety Data Sheets indicating environmental and safety precautions and the toxicity of the materials.

Where the properties of cleaning materials reduce the impact on the environment and risk of adverse health effects, such as low toxicity cleaning chemicals or cleaning cloths that do not require chemicals, these are to be offered over the conventional materials. Such a provision should be highlighted in the submission for consideration as it is appreciated this may impact on the price for the supply of the materials.

4.0 Emission management system for diesel vehicles

The Contractor must introduce an emission management system that complies with the standards of the Clean Fleet™ Program for Diesel Vehicle Maintenance for all collection vehicles that are diesel vehicles. Within 6 months of the Services Commencement Date, the Contractor should become a member of the Clean Fleet™ Program for Diesel Vehicle Maintenance and pay any associated costs including for periodic audits.

Scope of work (property requirements)

Waste management and recycling

A comprehensive waste management and recycling program using an approved recycling contractor will constitute a major part of this contract.

Waste removal performance objectives

- To maintain an appropriate size and frequency of service applicable to the recycling activity within the property in a cost-effective manner.
- To collect, remove and dispose of all wastes in accordance with relevant State environmental legislation
- To ensure all recyclable wastes including paper, cardboard, co-mingled containers and wet wastes (if applicable) are removed to a proper recycling or reprocessing facility, and
- To ensure all waste activity is quantified (by weight) and outcomes verified for reporting back to building management.

Waste handling generally

Waste material (recyclable and putrescible) collected from tenants' floors shall be by lightweight, leak-proof, collapsible trolleys. Contractors will ensure that the corners of these trolleys are suitably protected to prevent damage to office furniture and equipment and to walls within the building. The contractor shall only use the goods lift for wet and recycling material removal. This lift [if applicable] will be available for this purpose between the hours of [1800 to 0600 the following morning].

Putrescible waste and the recyclable wastes are to be collected in separate colour-coded bags and placed in the bins located in the [basement/ground floor loading dock] for collection by the responsible contractors. Black bags are to be used for putrescible waste only. If

supplied, the waste contractor's container (e.g. skip, compactor), or similar equipment provided by the Landlord, will be used to store the wastes.

The Contractor is to ensure all waste storage facilities have adequate and appropriate signage to ensure no contamination of waste containers by inappropriate wastes. The Contractor is also to ensure that tenants do not contaminate the waste containers or leave materials or prevent proper working of the waste containers. The Contractor is to ensure the waste contractor has adequate access to the waste containers for removal and delivery.

The Contractor is to advise the building manager immediately where hazardous or toxic materials have or are likely to have been disposed of in the waste system.

The Contractor is to advise building management where opportunities arise or are identified to improve the recycling system and further divert wastes from landfill.

Wet/putrescible waste removal responsibilities

The Contractor is responsible for:

- delivery of wet waste to a waste collection point on a daily basis as described in the cleaning scope of works
- safe removal of tenant waste from the property, including redundant chemicals used for cleaning services
- supplying and maintaining appropriately sized waste bins serviced at optimum frequency as applicable to the property and the generation of waste
- ensuring signage on tenant waste bins (if provided), particularly in office hubs or similar central bin locations, is easily visible and appropriately located to facilitate waste disposal by building occupants
- where directed by the building manager, installation and maintenance of an odour desensitising system, or similar, in the basement or central waste handling area
- ensuring waste is not stored on the premises for an unnecessary period of time so as to lead to odour, vermin problems or complaints by tenants
- removal of all waste from the property to a licensed waste facility
- collecting and reporting to the building manager waste performance on a monthly basis and maintaining records as necessary to verify performance (by weight only of material removed)
- assisting the building manager as necessary and providing all information required during the course of waste performance reviews or activity audits, and
- making recommendations to and assisting the building manager in efforts to increase tenant awareness of waste avoidance or minimisation.

Recycling service performance responsibilities

The Contractor shall be responsible for:

- day-to-day operation of recycling systems in a way that maximises recycling efficiencies
- provision of adequately sized, located and signed recycling containers within tenant floors and in the central waste handling area in the [basement/ground floor loading dock]

- the use of a colour-coded bag system to allow differentiation of recyclable materials from generation point to the recycling collection point
- periodically assessing the contamination rates of material disposed of in the recyclable containers/bins and advising the building manager if contamination is likely to be significant or put at risk the collection of recycled material by the recycling contractor
- delivery of recycling material to recycling collection points on a basis as described in the cleaning scope of works
- ensuring all recycling material collected and removed from the building is sent to the appropriate recycling facility for reprocessing of these materials
- collecting and reporting to the building manager recycling performance on a monthly basis and maintaining records as necessary to verify recycling performance (by weight only of material in each recycling stream removed)
- assisting the building manager as necessary and providing all information required during the course of waste performance reviews or activity audits, and
- making recommendations to and assisting the building manager in efforts to increase tenant awareness of recycling and improved recycling results.

Education

The Contractor must actively participate in the education and training of tenants in the use of these services. This includes:

Developing and delivering pre-service and start-up education

The Contractor will nominate and provide appropriately qualified and experienced personnel to develop, implement and evaluate the pre-service and start-up education program on behalf of the building manager. The pre-service and start-up education phase will cover the period prior to the Services Commencement Date and include the first 12 months of the Contract Term.

The Contractor must purchase environmentally preferable goods where possible for the development of the pre-service and start-up education. Printed materials should be produced in an environmentally sensitive manner and must contain a minimum of 50% recycled fibre and be manufactured using cleaner production printing practices, including but not limited to, use of vegetable-based inks and manufacture without the use of bleaches containing chlorine.

Pre-service and start-up education plan

One month prior to the Services Commencement Date, the Contractor must provide a draft pre-service and start-up education plan for approval by the building manager.

At a minimum, this plan must include:

- ultimate and immediate outcomes of the plan
- design and production of bin stickers
- design and production of pre-service information flyers
- tenant information packages
- other initiatives to assist tenants to correctly use the Services
- proposed environmentally preferable goods to be purchased

- detailed timeline and responsibilities for activities
- details on how the plan will be evaluated including useful, feasible key performance indicators for the ultimate and immediate outcomes, and
- ongoing education for tenants on at least an annual basis.

The pre-service and start-up education plan must be approved by the building manager prior to implementation. The Building Manager reserves the right to make amendments or additions to the education plan prior to final approval.

Ongoing education

Annual education plan

Two months prior to each anniversary of the Contract Commencement Date, the Contractor will prepare and submit for approval, a detailed annual education plan for the following year of the Contract. This will include:

- ultimate and immediate outcomes of the plan
- groups that the plan will target
- strategies to be used to target each group
- new resources to be developed
- reprinting of existing resource materials
- proposed environmentally preferable goods to be purchased
- details of how the plan will complement or enhance other contractual obligations such as contamination management and reporting recycling performance back to users on a quarterly basis
- specific timeframes and responsibilities for carrying out tasks
- reporting timeline and methods
- details on how the plan will be evaluated including useful, feasible key performance indicators for the ultimate and immediate outcomes, and
- methods of ensuring that customers understand the importance of:
  - – separated waste streams
  - – end-markets for recyclables
  - – outcomes of recycling by material types, and
  - – minimising waste.

The annual education plan must be approved by the building manager prior to implementation.

Reporting

The Contractor must provide reports on a quarterly basis as per Section XXX and as required by [specific agencies]. The reporting should be in accordance with NSW Government Policy and the Contractor's compliance with that policy.

The Contractor must report waste and recycling flows on a monthly basis and maintain records as necessary to verify recycling performance (by weight only of material removed). Where data is collected in volume then the conversion factor used must also be disclosed.

The Contractor must report composition of the co-mingled recycling streams on a 6-monthly basis via an accredited third-party verified audit. This must be a percentage figure (%) of the different recyclables collected.

The Contractor must verify the sorting efficiency of any off-site separation of co-mingled recyclable material. The ‘sorting rate’ of the Sorting Facility must be provided via an accredited third-party verified audit. This must be a percentage figure (%) of the recycling and re-use materials collected from a particular building.

Managing indoor environment quality

3.8

Context

Managing indoor environment quality (IEQ) is an essential component of the sustainability plan for any commercial property. The quality of the environment created within a building is fundamental to its occupants' health and wellbeing. This is particularly true for commercial property – both office and retail – where many people spend a large proportion of their working life, generally in an artificially maintained environment.

The indoor environment is influenced by:

- indoor air quality (IAQ) – ventilation standards, air change effectiveness and levels of pollutants (chemical, biological and physical)
- lighting quality – light levels, both artificial and natural, and visual comfort
- acoustic quality – noise levels
- thermal comfort – temperature, humidity and air speed
- office layout – spatial arrangements of walls, partitions, furniture and equipment in relation to fixed elements like windows and heating, ventilation and air conditioning (HVAC).

Engaging with tenants is an important part of managing indoor environment issues because responsibility is often shared between the building owner and the building occupants. You can help tenants by giving them advice about how to manage indoor environment quality and by outlining the flow-on benefits they might enjoy, such as improved workplace productivity. Increasingly, tenants are keen to avoid risks to their staff from occupying unhealthy buildings. This is putting greater pressure on building owners to introduce systems to ensure – and be able to prove – they have and can maintain a high level of indoor environment quality.

What's in this section

Drivers for managing indoor environment quality

Recently there has been significant international focus on healthy indoor environments and the links to occupant wellbeing and productivity. The 'Your Building' website (www.yourbuilding.org/display/yb/Home) presents recent IEQ research and case studies applicable to the Australian property industry.

Key drivers for tenants and building occupants

- Realise improved work performance benefits due to a pleasant and comfortable working environment.
- Realise commercial benefits from improving the productivity of individuals – for the individuals and the whole organisation.
- Reduce illness, absenteeism and building-related illness rates.
- Help attract and retain high quality staff.

Key drivers for property managers and owners

- Achieve better rental yields and retain tenants.
- Reduce tenant complaints and hence achieve operational and maintenance costs savings.
- Maximise marketing opportunities derived from improving the reputation of the property or organisation.
- Achieve high-performing buildings as recognised by the environmental rating tools.
- Reduce exposure to possible litigation and insurance costs.
- Reduce the burden of compliance in the future.

These drivers have been sourced from 'Your Building: Indoor environment, productivity and sustainable commercial buildings', Philip Paevere and Steve Brown et al, 2007. For more information visit the 'Your Building' website: www.yourbuilding.org/display/yb/Home

Steps: Managing indoor environments

1 Measure baseline performance

Gather information to establish a baseline analysis of your property. You could use the indoor environment review in Worksheet 3.8A as a guide. Some of this information can be obtained from BMCS (building management and control systems) and utility records, and other aspects will require a site inspection. This review will increase your understanding of the physical characteristics of the property that influence its indoor environment quality and help you to identify any data gaps that may need to be addressed.

Investa staff benefit from healthier office fitout

'Investa prides itself on the quality of office accommodation it provides to tenants and has 'walked the talk' in its own office accommodation at 126 Philip Street Sydney. In addition to the fitout's strong performance on energy – 30% more energy efficient than the level required to achieve a 5-star tenancy rating under NABERS Energy – it has been rewarded a 5-Star Green Star Office Interiors rating in recognition of broader sustainability credentials, including healthier indoor environment quality. Innovative features incorporated into the fitout include:

- Outside air supply volumes have been increased to 50% more than a typical office to give people fresher air (using the supplementary supply normally dedicated to meeting rooms).
- None of the paints used emit harmful fumes – nor will they off gas harmful volatile organic compounds (VOCs) into the work environment.
- There are no toxic chemicals in any of the joinery substrates.
- There is a specially selected pot plant for every person in the office to help filter the air.

In February 2008, an Office Environment Satisfaction Survey was undertaken among Investa office staff at 126 Phillip Street by Bond University in association with the Green Building Council of Australia to explore the impact of the 'green' initiatives. The survey revealed a high level of satisfaction with the office environment overall. Of the 64 respondents, the following percentages of staff agreed with these comments:

- 84% – "I have a positive opinion about my workplace."
- 80% – "My physical office environment has a positive impact on my job satisfaction."
- 94% – "Working in a Green Office makes me feel that my organisation has genuine concerns about the wellbeing of its employees"'

(See photo page 3.)

Investa Property Group

Implement measures that will help you to better understand the risk factors in base building operation. Make sure these factors are included in regular building inspections.

2 Benchmark and set performance targets

Use the NABERS Indoor Environment rating system to benchmark your building's performance and set performance targets for your indoor environment. Establish a measuring and monitoring regime to support your performance reporting (see www.nabers.com.au).

NABERS Indoor Environment has been designed to reflect the sharing of responsibility for indoor environment quality between owner and occupant. By making this information available and working with your tenants you could add value to the tenancy relationship.

What does NABERS Indoor Environment involve?

NABERS Indoor Environment assesses five environmental measures: air quality, acoustic comfort, lighting, office layout and thermal comfort. Which measure is assessed for each rating type (Base Building, Whole Building or Tenancy) reflects the ability to control the measure. For example, thermal comfort is not assessed for Tenancy ratings as this measure is not generally controlled by the tenant.

NABERS Indoor Environment involves direct physical measurements of a range of indoor pollutants, sound levels, temperature, relative humidity, air speed and lighting levels. For NABERS Indoor Environment Tenancy and Whole Building ratings the assessment includes an occupant satisfaction survey to provide an indication of satisfaction with various aspects of the indoor environment that cannot be fully assessed through direct physical measurements (refer to Worksheet 3.8D for more information). An occupant satisfaction survey is not required for Base Building ratings.

Self assessment for your building?

You can self-assess the environmental performance of the base building at no cost using the NABERS self assessment calculator (see www.nabers.com.au). This involves collecting temperature, relative humidity and air speed data, measuring Particulate (PM_{10}), airborne microbial and carbon dioxide levels and recording the base building sound levels to assess how well the building removes external noise and how noisy or silent base building services are (e.g. air conditioning). Most building management systems are designed to record temperature, relative humidity and air speed data, but may need to be set up to retain this information over a longer time period.

Investa's fitout at 126 Philip Street Sydney

NABERS

About NABERS

NABERS is the National Australian Built Environment Rating System managed by the Department of Environment and Climate Change NSW. NABERS is a performance-based rating system which measures the operational environmental impacts of existing buildings.

NABERS office tools can be applied to three distinct situations:

- **Tenancy** ratings that cover the space occupied by a single tenant and under the control of that tenant
- **Base Building** ratings that cover all office spaces for that building, and measure the parameters that are under the control of the landlord or base building
- **Whole Building** ratings that are a combination of both Tenancy and Base Building for the situation where a tenant is the owner and/or has control of all services.

For more information see www.nabers.com.au

Under NABERS, a higher score is awarded where there is a 12- month period of continuous temperature, relative humidity and air speed data.

Accredited assessment

To use the NABERS Indoor Environment Base Building rating to promote your property, or to undertake a NABERS Indoor Environment Whole Building or Tenancy rating to promote your organisation, or to use the NABERS trademarks, you must obtain a rating from a NABERS Accredited Assessor. Employ an assessor with good knowledge of sustainability practices in both commercial property design and management. A list of assessors is available at www.nabers.com.au

3 Develop an indoor environment action plan

Once you have established a baseline and performance targets for your building, develop an action plan for managing indoor environment issues and implementing improvement initiatives.

Use a simple risk assessment exercise to prioritise the actions. This is particularly important where real or perceived risks may be high, such as in situations where there is a history of tenant complaints or where pollutant concentrations are more likely to be high (e.g. poorly ventilated car parks).

Work out what remedial measures need to be undertaken, and when. For example, does the risk mean that measures should be undertaken:

- immediately e.g. to address occupational health and safety issues
- as part of ongoing building maintenance, or
- as part of refurbishment activities, and perhaps requiring collaboration with tenants.

The action plan should also identify responsibilities. Where issues are primarily a tenant responsibility, the plan needs to nominate a strategy for working with the tenant to raise their awareness of the issues and identify remedial measures.

Worksheet 3.8B details some mitigation measures to improve air quality. For in-depth advice and technical detail on this subject refer to *Indoor Air Quality, Mechanical Engineering Services Application Manual No. DA 26,* Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH), www.airah.org.au

Make sure indoor environment improvements are included in scheduled cyclic maintenance or capital upgrades and in the building's operational budgets.

New thinking about thermal comfort

'Thermal comfort of building occupants is determined by air temperature, mean radiant temperature, air speed, relative humidity and expectation. Then there are two personal parameters – clothing (insulation) and activity level (body heat).

In office buildings the most common thermal discomfort is people being too cold in summer. This is often the result of a mismatch between clothing levels (selected for variable outdoor weather) and a constant air conditioned indoor temperature.

Predicted Mean Vote (PMV) is an index which represents the average comfort level experienced by a large group of people exposed to the environment in question. A related index is the Predicted Percentage Dissatisfied (PPD) which, as the name suggests, estimates what proportion of the occupants in a given environment will be dissatisfied due to thermal factors. The PMV/PPD indices aim to achieve a high level of thermal comfort in a fully sealed, air conditioned building.

In 2004, The American Society of Heating, Refrigeration and Air Conditioning Engineers, in ASHRAE Standard 55-2004, adopted the ADAPTIVE model of thermal comfort for mixed mode and naturally ventilated buildings. In 2007 the Europeans followed suit with Standard EN 15251. Occupants of such environments are generally more tolerant of thermal discomfort and can take some actions such as opening or closing a window in order to restore comfort to their indoor environment. This represented a fundamental shift in thinking about how to achieve comfort in commercial buildings. Older models such as PMV/PPD ignored completely the myriad factors contributing to a building occupant's comfort expectations.'

Assoc. Prof. Richard de Dear,
Division of Environmental and Life Sciences,
Macquarie University, Sydney

Keep abreast of local and international research and information available through industry associations. Wherever practical, apply this knowledge to improving the quality of your property's indoor environment.

4 Check building services and management control systems are running effectively

Make sure all building services are functioning to the required specifications and meeting the needs of the building occupants. For example, are temperature settings based on predicted occupant use? Make sure building records include up to date information on:

- HVAC equipment
- modifications to the building that might impact on HVAC functions
- information about chemicals stored and their storage requirements.

5 Review maintenance procedures

A good preventive maintenance program is probably the most effective management tool for preventing problems. Consult building services specialists to confirm preventive maintenance practices and make sure subcontracting arrangements are achieving the best results. Check that maintenance procedures effectively cover:

- **Air and water systems** – understand and implement the best practice requirements set out in *AS/NZS 3666.2: Air handling and water systems of buildings – Microbial control – Operation and maintenance* (see Standards Australia SAI GLOBAL webshop, www.saiglobal.com/shop/Script/search.asp).
- **Cleaning procedures** – use cleaning procedures to help reduce the presence of indoor pollutants such as mould and dust. Make sure cleaners use only low toxicity cleaning agents (e.g. natural, solvent-free and hydrocarbon-free cleaning products) and store chemicals safety. Check that cleaning staff are adequately trained in awareness of indoor environment issues and what they need to do to reduce risks.
- **Storage of chemicals** – check that chemicals, including cleaning products and pesticides, are stored in such a way that they do not impact on indoor environment quality.
- **Maintenance and repair activities –** where possible make sure that paints, adhesives and sealants used for repair and maintenance jobs have low levels of volatile organic compounds (VOCs), e.g. water-based glues and natural paints. Make sure all maintenance contractors are aware of your requirements.

Measures of indoor environment quality

'The Green Building Council of Australia's *Technical Manual for Green Star Office Design & Office As Built* Version 3, 2008 – Section: Indoor Environment Quality – contains the following measures (with explanations):

- ventilation rates
- air change effectiveness
- carbon dioxide monitoring & control
- daylight
- daylight glare control
- high frequency ballasts
- electric lighting levels
- external views
- thermal comfort & control
- hazardous materials
- internal noise levels
- volatile organic compounds
- formaldehyde minimisation
- mould prevention
- tenant exhaust riser.'

Green Building Council of Australia
www.gbca.org.au

6 Develop a sustainable refurbishment strategy

Many indoor environment risks can be mitigated through careful design and choice of materials. Refurbishments and upgrades provide the opportunity to use healthier alternatives to high-risk building materials, finishes and furnishings.

Design attributes that improve IEQ

The Green Building Council of Australia's Green Star rating system allocates credit points for building attributes that improve or help reduce impacts on indoor environment quality, including maximising daylight and reducing glare. The Green Star Interiors tool can be used to guide design and material choices – see www.gbca.org.au

Product choices that improve IEQ

Good information is available about the environmental performance of many commercial building fitout materials, products and office equipment. Information can be found in sources such as:

- manufacturers' environmental fact sheets or material data sheets
- product certification schemes such as the Good Environmental Choice Label administered by the Australian Environmental Labelling Association: www.aela.org.au
- 'ecospecifier' – an online tool with information about environmentally preferable products, materials, technologies and resources: www.ecospecifier.org
- 'Sustainable Choice' – a sustainable procurement program for NSW local government that also has an online database with information about sustainable products and services: www.lgsa-plus.net.au/sustainablechoice

Post-refurbishment occupation

Make sure there is sufficient time to purge newly constructed premises before occupation. This could include repeated outside air exchange cycles in HVAC operation, washing down surfaces to remove dust, or sealing and heating premises to accelerate off gassing from building materials or finishes such as paints and glues.

Participate in post-occupancy evaluation research programs involving new or refurbished buildings or tenancies.

Worksheet 3.8C summarises design measures that can improve air quality during fitouts. See also Section 4: 'Sustainability and Project Delivery'.

7 Engage with tenants

It's extremely important to work with tenants during the design phase of any fitouts or refurbishments because many of their choices – materials, finishes, fittings, locations of printing equipment, office layout – will have significant impacts on indoor environment quality. Strategies for working with tenants include:

Regular engagement

Implement measures to regularly engage with tenants about indoor environment issues, including the operation of base building facilities and tenancy facilities.

Consider using an annual survey similar to the tenant survey included in Worksheet 3.8D. Discuss the findings with the tenants and agree on improvement actions.

Collaborate on gathering information about trends in productivity levels including sick leave, time off, workplace injuries and staff complaints.

Responding to tenant issues or complaints promptly

Make sure tenants can see you have responded to their concerns. Promptly identify the source of an issue and the actions that will be required to deal with it.

Educating tenants

Work with tenants to help them understand how they can actively contribute to improving indoor environment quality. For example,

encourage them to place indoor plants in the workplace because this can help to reduce indoor pollutants. However, make sure tenants also understand that over watering of plants could generate mould and fungi.

Encourage tenants to design and manage their fitout in accordance with the Green Building Council of Australia's Green Star Office Interiors tool (see www.gbca.org.au).

Encourage tenants to consult the *Green Lease Guide* – a good source of tips for improving a tenancy fitout (e.g. choices of materials and finishes, joinery, floor coverings, workstations etc.) and office operations (e.g. equipment choice). See www.environment.nsw.gov.au/sustainbus/greenlease.htm.

Reporting improvements

Keep tenants informed about any improvements or modifications you have initiated that will enhance their indoor environment quality, such as higher ventilation rates or upgrades to the HVAC system.

8 Establish ongoing monitoring

Make sure operational budgets include allowances for regular monitoring, particularly in higher risk situations. Use the monitoring data to show trends in indoor environment quality so this information can be used to inform management decisions.

Set up an annual testing regime, using an accredited assessor, in accordance with NABERS standards so you can benchmark your building against industry practices (see www.nabers.com.au).

9 Report performance

Review and report on indoor environment quality as part of your annual building performance review. Use public reporting, such as the NABERS program, to ensure accountability and make a positive contribution to your organisation's reputation.

CH2 – Council House 2, Melbourne

'CH2 is a 10-storey office building that houses approximately 500 City of Melbourne staff and also has some ground floor retail space. The building has a 6-star Green Star rating and has been occupied since October 2006. It incorporates a range of sustainable design philosophies and technologies including use of photovoltaic cells and wind driven turbines, active louvres, opening windows on the north and south facades, sewer mining for water recycling, night purging and chilled beams to aid air circulation and radiant cooling. Indoor environment quality design features include 100% fresh air ventilation, radiant and evaporative cooling, use of low toxicity materials and extensive use of plants.'

www.agdf.org.au/Images/ftp/Information/Projects/MelbourneCC_CH2.pdf

Further information

- NABERS, www.nabers.com.au
- Green Lease Guide, www.environment.nsw.gov.au/sustainbus/greenlease.htm
- Your Building, recent Australian research, including 'Your Building: Indoor Environment, productivity and sustainable commercial buildings', Philip Paevere, Steve Brown et al, 2007, www.yourbuilding.org/display/yb/Home

- Standards Australia, www.standards.com.au; SAI GLOBAL webshop, www.saiglobal.com/shop/Script/search.asp
- Good Environmental Choice Label, Australian Environmental Labelling Association, www.aela.org.au
- 'ecospecifier' guide to environmentally preferable products and materials, www.ecospecifier.org
- 'Sustainable Choice' sustainable procurement program for NSW local government, www.lgsa-plus.net.au/sustainablechoice
- For articles and technical papers: Australian Institute of Refrigeration Air Conditioning and Heating (AIRAH), www.airah.org.au
- *Indoor Air Quality, Mechanical Engineering Services Application Manual No. DA 26*, Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH)
- Building Code of Australia, www.abcb.org.au
- CSIRO Australia, www.csiro.au/science/psd1.html
- Clean Air Society Of Australia & New Zealand, www.casanz.org.au/
- 'Indoor Air Quality', State of the Environment Technical Paper Series, Australian Government Department of The Environment, Water, Heritage and the Arts, www.environment.gov.au/soe/1996/publications/technical/12indora.html
- 'Air Toxics and Indoor Air Quality in Australia', State of knowledge report, Environment Australia 2001, Australian Government Department of the Environment and Water Resources, www.environment.gov.au/atmosphere/airquality/publications/sok/index.html
- *ESD Design Guide for Australian Government Offices* (Edition 2), (former) Commonwealth Department of Environment and Heritage, 2006
- ESD Case Study: 'Council House 2, Melbourne, Victoria', www.agdf.org.au/Images/ftp/Information/Projects/MelbourneCC_CH2.pdf
- 'Indoor Environment Quality and Occupant Productivity in the CH2 Building': Post Occupant Summary Report #USP2007/23, Philip Paevre & Stephen Brown, CSIRO Highett, Victoria, 2008
- *Exposure Standards for Atmospheric Contaminants in Occupational Environment*, National Health and Medical Research Council, Australian Government Publishing Service, 1995
- *Green Star Office Design & Office As Built Technical Manual*, Version 3, 2008, Green Building Council of Australia, www.gbca.org.au
- National Occupational Health and Safety Commission, www.nohsc.gov.au
- 'Indoor Air Quality in Large Buildings', US EPA, www.epa.gov/iaq/largebldgs/index.html
- EcoLibrium, 'How well do we understand thermal comfort?', December 2007, www.airah.org.au
- American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), www.ashrae.org
- ASHRAE Standard *55-2004, Thermal Environmental Conditions for Human Occupancy*

Worksheets

Review and use these Word documents:

3.8A Indoor environment review

3.8B Indoor pollutant sources and tips on mitigation

3.8C Indoor air quality considerations during fitouts

3.8D Tenant survey: indoor environment quality

Worksheet 3.8A

Indoor environment review

Use this review to identify issues and the measures that can be carried out to improve indoor environment quality. For benchmarking indoor environment quality use NABERS methodology (see www.nabers.com.au). This is an example only – adapt this worksheet to suit your organisation's requirements.

Property:		
Address:		
Tenant:		
Prepared by:		Date:
Approved by:		Date:

	Whole building	Actions required/ responsibility
Overall:		
Is there a tenant complaints register that includes indoor environment issues?		
Have tenant issues been satisfactorily resolved?		
Has an occupant satisfaction survey been undertaken?		
What remedial measures are in place as a result of the survey? (and when will they be carried out)		
• immediately		
• during ongoing maintenance		
• as part of refurbishment		
Has a NABERS Indoor Environment rating been undertaken?		
• Was it a self-assessment or accredited assessment?		
List all common areas in the building, e.g. foyers, lifts, stairwells, carpark, outdoor areas		

	Tenanted areas	Base building	Actions required/ responsibility
1 Thermal comfort			
Does the building management control system (BMCS) record:			
• space temperatures?			
• relative humidity?			
• outdoor temperatures?			
Is the BMCS system providing appropriate space temperatures and relative humidity?			
Have spot readings for the above also been taken?			
Have there been any tenant complaints about thermal comfort in common areas or in tenancies?			
What modifications have been made to the building or tenancies that may impact on the HVAC system?			
2 Air quality			
Is the BMCS providing optimum air quality and ventilation rates?			
Have there been any tenant complaints about air quality in common areas or in tenancies?			
Has testing been undertaken for:			
• carbon dioxide			
• carbon monoxide			
• particulate matter			
• airborne microbials			
• –formaldehyde			
• total volatile organic compounds (VOCs)			
Have possible and actual sources of indoor air pollutants been identified?			
What remedial measures can be undertaken? (and when)			
• immediately (safety issues)			
• during ongoing maintenance			
• as part of refurbishment			

	Tenanted areas	Base building	Actions required/ responsibility
Are procedures in place to encourage, or require, new tenancy fitouts to minimise the introduction of pollutants during fitout and in the ongoing management of premises?			
3 Lighting			
Have there been any tenant complaints about lighting in common areas or tenanted areas?			
Have luminance levels been assessed in the tenanted office spaces?			
What remedial measures can be undertaken? (and when)			
• immediately (safety issues)			
• during ongoing maintenance			
• as part of refurbishment			
4 Acoustic comfort			
Have there been any tenant complaints about noise in common areas or in tenanted areas?			
Have the ambient sound levels been measured in the tenanted office spaces?			
What remedial measures can be undertaken? (and when)			
• immediately (safety issues)			
• during ongoing maintenance			
• as part of refurbishment			
5 Office layout			
Are procedures in place for working with tenants to raise awareness of indoor environment issues?			
Has consideration been given to optimising:			
• air quality and ventilation			
• access to natural light			
• minimal noise			
• privacy			
• lighting, including task lighting			
• temperature			
• workstation design			

	Tenanted areas	Base building	Actions required/ responsibility
Are procedures in place to make sure new tenancy fitouts do not compromise air or water handling systems?			

Worksheet 3.8B

Indoor pollutant sources and tips on mitigation

Category/common sources	Tips for mitigation and control
Housekeeping and maintenance	
cleaning products waxes and polishes disinfectants 'air fresheners' adhesives cleaners' cupboards storage cupboards wet mops drain cleaners vacuuming paints and coatings solvents pesticides lubricants	• Use low-emission products • Avoid aerosols and sprays • Dilute to proper strength (manufacturer's instructions) • Do not overuse • Use during unoccupied hours • Use proper protocol when diluting and mixing • Store properly with containers closed and lid tight • Use exhaust ventilation for storage spaces (eliminate return air) • Clean mops: store mop top up to dry • Avoid 'air fresheners' – clean and exhaust instead • Use high-efficiency vacuum bags and filters • Use integrated pest management • Record all materials stored and used
Occupant-related sources	
tobacco products office equipment: printers photocopiers ovens or microwaves art supplies marking pens paper products personal products (e.g., perfume) tracked in dirt or pollen	• Enforce non-smoking policy • Use exhaust ventilation with pressure control for major local sources • Use low-emission art supplies and marking pens • Avoid paper clutter • Provide educational material for occupants and staff

Category/common sources	Tips for mitigation and control
Building uses as major sources	
print and photocopy shop dry-cleaning science laboratory medical office hair or nail salon cafeteria pet store	• Use exhaust ventilation and pressure control • Use exhaust hoods where appropriate; check hood airflows
Building-related sources	
plywood or compressed wood construction adhesives asbestos products insulation wall and floor coverings (vinyl or plastic) carpets and carpet adhesives wet building products transformers upholstered furniture renovation and remodelling	If materials that will offgas will be used, e.g. those containing VOCs or formaldehydes: • Use low-emission products • Air out in an open or well ventilated area before installing • Increase ventilation rates during and after installation • Keep material dry before enclosing • Apply an appropriate sealant • Follow renovation guidelines
HVAC systems	
contaminated filters contaminated duct lining dirty drain trays humidifiers lubricants refrigerants mechanical rooms cooling towers maintenance activities combustion appliances boilers and furnaces hot water systems generators stoves	• Perform HVAC preventive maintenance in accordance with AS/NZS 3666.2 • Check filter change protocols • Clean drain trays; check slope and drainage • Use potable water for steam humidification • Keep duct lining dry; move lining outside duct if possible • Fix leaks and clean spills (see filter change protocol) • Maintain spotless mechanical room (not a storage area) • Avoid back drafting • Check and maintain flues from boilers to outside • Keep combustion appliances properly tuned • Disallow unvented combustion appliances • Perform polluting activities during unoccupied hours

Category/common sources	Tips for mitigation and control
Moisture	
Mould	• Keep building dry • Review mould and moisture control protocols
Vehicles	
Underground or attached carpark	• Use exhaust ventilation • Maintain carpark under negative pressure relative to the building • Check air flow patterns frequently • Monitor carbon monoxide

Source: US Environmental Protection Agency: www.epa.gov/iaq

Worksheet 3.8C

Indoor air quality considerations during fitouts

Component	Factors to control	Design/management options
From outside the building		
Climate	Air temperature and humidity	Optimise ventilation
Outside air ventilation and infiltration	Intake air quality	Select location of intake to reduce non-designed air entry
Infiltration of water	Unwanted moisture entry	Design and maintain waterproof construction; ensure moisture does not form in heating, ventilation and air conditioning (HVAC) systems
From the building and HVAC systems		
Building design	Natural or mechanical ventilation	Building depth, location and orientation
Adhesives and sealants	Solvent emissions	Chose low-emission products
Glass	Lamination inter-layers and coatings	Impact on indoor air quality (IAQ) unknown as yet
Metals	Pre-painting	Impact on IAQ unknown as yet
Termite control	Chemicals	Use mechanical over chemical controls
Timber preservation	Use of toxic chemicals	Avoid where possible; use durable timbers
Brick and block	Natural radioactivity	Found to be low in a range of products
Timber framing	Volatiles affecting sensitive individuals	Impact on IAQ unknown as yet
Thermal insulation	Fibre and volatile organic compound (VOC) emissions	Product selection
HVAC systems	Generation, transfer and removal of air contaminants	System design and maintenance
Interior design generally	Pollutants sources, ventilation flow	Material selection, ventilation design
Plywood/laminated veneer lumber (LVL)	Formaldehyde and VOCs	Select low-emission products
Reconstituted wood based panels/veneers	Formaldehyde and VOCs	Select low-emission products and overlay adhesives
Plastic laminates	VOCs	Select low-emission adhesives

Component	Factors to control	Design/management options
Plaster/gypsum board	Few emissions but sinks for pollutants	
Ceramic tiles	Emissions from adhesives and grouts	Select low-emission adhesives
Wallpaper	Formaldehyde and VOCs	Low-emission products; delay occupancy
Paints	Solvents and additive vapours during and after application	Low-emission products
Carpet	Odour and VOCs; accumulation of contaminants	Low-emission adhesives; cleaning methods; walk-off mats
Linoleum	VOCs from adhesives	Low-emission products
Vinyl	Long-term emissions of volatiles and plasticisers	Low-emission products
Furnishing and furniture	Formaldehyde and VOCs from components and surface treatments; dust collection	Low-emission products; avoid thick fibre coverings
Equipment and appliances	VOCs and ozone from photocopiers and printers; combustion products from gas and fuel appliances	Low-emission products; exhaust flues
Occupant activities	Smoking, cooking, hobbies, cleaning	Smoking prohibition, range hoods, cleaning regime
Pest management	Pesticide residue, indoor and outdoor	Product usage
Cleaning	VOCs from cleaning products; dust disturbance	Low emission/toxicity products; high efficiency vacuum cleaners
Interior renovation practices	Pollutant transfer through building	Isolate the area

Adapted from the CSIRO BCE Technical Report TR97/3, December 1997

Worksheet 3.8D

Tenant survey: indoor environment quality

The purpose of an occupant satisfaction survey is to provide a good indication on how indoor measures such as lighting and air quality impact on the occupants. Occupant satisfaction surveys provide useful information on occupant satisfaction that is not easily measured through direct (quantitative) measurements, for example office layout.

To avoid any survey bias, the occupant survey must be done prior to any direct measurements.

NABERS Indoor Environment – Tenancy and Whole Building Ratings

Occupant Satisfaction Survey

Introduction

The aim of the NABERS Indoor Environment rating tool is to measure the impact of a building on the environment and its occupants. The NABERS Indoor Environment tool uses a combination of direct measurement and an occupant satisfaction survey for Tenancy and Whole Building ratings. An occupant satisfaction survey is not required for Base Building ratings.

NABERS uses an occupant satisfaction survey for Tenancy and Whole Building NABERS Indoor Environment ratings to provide an indication of satisfaction with various aspects of the indoor environment that can not be fully assessed through direct (quantitative) measurements. The occupant satisfaction survey is not a health or safety survey and is more directed towards measuring comfort and satisfaction. NABERS assumes that health and safety is covered under statutory obligations.

There are two recognised NABERS occupant satisfaction survey providers with surveys that are benchmarked to best practice and can therefore provide reliable evaluation of some aspects of the indoor environment.

Instructions

To apply for a NABERS Indoor Environment Tenancy or Whole Building rating, an online occupant satisfaction must be undertaken by one of the two recognised providers. This survey must be undertaken prior to any direct measurements.

To ensure an appropriate response, the occupant survey must be available to staff for up to two weeks and as a minimum 75% of full-time staff must be surveyed, with a response rate of either 50% of distributed surveys or 40% of the total number of staff.

The two recognised NABERS providers are:

- Building Use Studies (BUS) – Usable Buildings, England
- Center for the Built Environment (CBE) – The University of California, Berkeley, USA.

The fee is approximately $1500 – $2000 per occupant satisfaction survey.

The results provided by the NABERS recognised provider are then entered into the NABERS Validation Protocol spreadsheet by an Accredited Assessor where it is combined with the direct measurements to give an overall score for each measure, e.g. air quality, lighting.

For further information on the two recognised NABERS providers contact NABERS at www.nabers.com.au

Self assessment occupant satisfaction survey

An occupant satisfaction survey has been developed for self assessments of the indoor environment. Please note that to apply for a NABERS Indoor Environment Tenancy and Whole Building rating, the occupant satisfaction survey must be undertaken online by one of the recognised NABERS providers listed above.

Instructions for a self assessment survey

All questions are rated on a scale of 1 to 7, with 1 being a very poor result that causes you discomfort or distracts you from your work and 7 being an excellent result for something that is noticeably pleasing. A score of 4 would indicate a neutral position where you are neither satisfied nor dissatisfied.

Please answer all questions and only answer each question once by placing a circle around the most appropriate answer. If you change your mind you can put a cross through your previous selection and then circle the new option.

If you have recently moved offices then please answer the questions as they relate to your new location only. If you work in more than one location in the same office (not in different buildings, the survey relates only to the current building) then please answer only for the space you occupy most of the time.

The survey is not intended to rate your satisfaction only on the day of completing the form, but you should try to remember conditions throughout the last year or as much of it as you can. For example, temperature conditions might be good in summer and poor in winter so your overall score should reflect this fact and how the building environment affects you throughout the entire year not just today or the last month. Similarly there might be an issue with space today because of packing boxes that you know will be moved shortly, but if the space has been good all year your score should reflect this.

Privacy

All survey results are confidential and no personal data will be collected. Individual results will not be analysed or distributed, but only the aggregated results will be used as part of a self assessment for the overall building or tenancy.

Survey questions

1 Thermal comfort

1a How satisfied have you been with the temperature level (i.e. whether you get too hot or cold) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

1b How satisfied have you been with the temperature stability (i.e. how much the temperature fluctuates during the day) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

1c How satisfied have you been with the level of airflow (i.e. do drafts make you uncomfortable, or is the air too still) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

1d How satisfied have you been with the humidity (i.e. do you feel either dry or clammy) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

1e Overall, do the thermal conditions (a combination of the above items) of this building interfere with your ability to get your job done, or enhance it?

Interfere *Enhance*

1	2	3	4	5	6	7

2 Air quality

2a How satisfied have you been with the odour (i.e. do smells distract you or limit your ability to perform your required tasks) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

2b How satisfied have you been with the level of dust (i.e. airborne and stationary) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

2c How satisfied have you been with the levels of mould and fungi (both smells and visual presence) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

2d How satisfied have you been with the levels of fresh air (i.e. at any stage do you feel stuffy, sleepy, or unnecessarily tired) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

2e When moving around your office, how satisfied have you been with the consistency (i.e. are the conditions the same in all parts of the workspace) of air quality at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

2f Overall, does the air quality (a combination of the above items) in your workspace interfere with or enhance your ability to get your job done?

Interfere *Enhance*

1	2	3	4	5	6	7

3 Acoustic comfort

3a How satisfied have you been with the level of air conditioning noise at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

3b How satisfied have you been with the levels of noise from outside the building (i.e. road traffic, aircraft, trains, pedestrians, events, etc.) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

3c How satisfied have you been with the level of general building equipment noise (i.e. lifts, machinery etc.) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

3d How satisfied have you been with your sound privacy (i.e. ability to have conversations without your neighbours overhearing and vice versa) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

3e How satisfied have you been with the amount and level of distracting noise (i.e. sudden or sustained noises coming from within the building or other occupants) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

3f Overall, does the acoustic comfort (a combination of the above items) interfere with or enhance your ability to get your job done?

Interfere *Enhance*

1	2	3	4	5	6	7

4 Lighting

4a How satisfied have you been with the quantity and quality of light (i.e. enough to perform your tasks without interference or eye strain) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

4b How satisfied have you been with the amount of glare (i.e. bright lights in your field of view or reflections on your screen) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

4c How satisfied have you been with the amount of light contrast (i.e. either finding it difficult to adjust to differing brightness levels, having strong shadows, or having very uniform and bland levels) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

4d How satisfied have you been with the amount of artificial lighting flicker at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

4e How satisfied have you been with the amount of natural light at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1 | 2 | 3 | 4 | 5 | 6 | 7

4f How satisfied have you been with the amount of lighting control (i.e. availability of dimmers, blinds for controlling natural light levels, etc.) at your workspace in the previous 12 months?

Very dissatisfied *Very satisfied*

1 | 2 | 3 | 4 | 5 | 6 | 7

4g Overall, does the lighting comfort (i.e. a combination of the above items) interfere with or enhance your ability to get your job done?

Interfere *Enhance*

1 | 2 | 3 | 4 | 5 | 6 | 7

5 Office layout

5a How satisfied have you been with the amount of work and desk space available for you to perform your job function in the previous 12 months?

Very dissatisfied *Very satisfied*

1 | 2 | 3 | 4 | 5 | 6 | 7

5b How satisfied have you been with the amount of storage available for you to perform your job function in the previous 12 months?

Very dissatisfied *Very satisfied*

1 | 2 | 3 | 4 | 5 | 6 | 7

5c How satisfied have you been with the location and arrangement of general office equipment (i.e. storage, printers, fax, copiers etc.) in the previous 12 months?

Very dissatisfied *Very satisfied*

1 | 2 | 3 | 4 | 5 | 6 | 7

5d How satisfied have you been with your proximity to a view (i.e. being able to see into the distance either through a window or pleasing outlook) in the previous 12 months?

Very dissatisfied *Very satisfied*

1 | 2 | 3 | 4 | 5 | 6 | 7

5e How satisfied have you been with the comfort of your office furnishings (i.e. chair, desk, computer, equipment, etc.) in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

5f How satisfied have you been with the appearance and quality of your office furnishings (i.e. chair, desk, computer, equipment, etc.) in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

5g How satisfied have you been with your ability to adjust your furniture to meet your needs in the previous 12 months?

Very dissatisfied *Very satisfied*

1	2	3	4	5	6	7

5h Overall, does the office layout (i.e. a combination of the above office layout items) interfere with or enhance your ability to get your job done?

Interfere *Enhance*

1	2	3	4	5	6	7

Responsible refrigerant use 3.9

Context

Synthetic refrigerants used in commercial property air conditioning systems have two main environmental impacts if they are released into the atmosphere:

- contributing to the depletion of the atmospheric ozone layer (ozone depleting potential, ODP)
- contributing to climate change through global warming (global warming potential, GWP). Some refrigerants have a global warming impact up to 3,000 times greater than CO_2 alone.

They also remain in the atmosphere for a very long time.

For these reasons, the control and phase-out of ozone depleting substances and synthetic greenhouse gases – from refrigerants and other sources such as foams, aerosols, solvents and fire extinguishers – is well underway. The original international agreement (the Montreal Treaty) was signed over 20 years ago and due to its success the mandatory timetable for the phase out of ozone-depleting substances has been accelerated.

As a result there has been a significant shift in the use and recovery of refrigerants in Australia. To continue this good performance you need to maintain a high standard of refrigerant management in existing buildings, including:

- being aware of your responsibilities e.g. it is illegal to deliberately release synthetic refrigerants such as chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs) into the atmosphere
- eliminating leakage of refrigerants – up to 20% of refrigerants used in commercial properties leak into the atmosphere during operation or maintenance activities
- seeking alternatives to synthetic refrigerants based on both ODP and GWP (some low ODP refrigerants have very high GWP e.g. R410A has a GWP of 2000)
- reclaiming unwanted refrigerants for destruction.

What's in this section

Making the transition to alternative refrigerants

In 1996 the Australian Government ended imports and manufacturing of CFCs and introduced controls on imports and manufacturing of HCFCs. The use of these transitional synthetic-based refrigerants was permitted to allow the industry to develop zero-ODP alternatives. Imports of HCFCs peaked in 1998–1999 and are subject to a phase-out quota system. Substantive imports will cease by 2020 with only very limited supplies then available until 2030 to service remaining HCFC-dependent equipment.

The commonly used transitional refrigerants are HCFCs such as R22 and R123. Because transitional refrigerants will also be phased out, many manufacturers are already moving to zero-ODP, chlorine-free substitutes such as hydrofluorocarbons (HFCs). HFCs include R134a, R407C and R410A, depending on the operating temperature of the air conditioning and heat pump systems.

Licensing and importation of transitional refrigerants is administered by the Australian Government Department of Environment, Water, Heritage and the Arts.

Source: *Air Conditioning and Refrigeration Industry Refrigerant Selection Guide 2003*, Australian Institute of Refrigerants, Air Conditioning and Heating (AIRAH), www.airah.org.au

Natural refrigerants

With the increased focus on refrigerants it's likely that more refrigeration system designers and users will select natural refrigerants as an alternative. In addition to having zero ODP and low or zero GWP, they are compatible with common materials found in refrigerating systems and are soluble in conventional mineral oils. They contain no chlorine or fluorine atoms so do not react with water to form the strong acids that can lead to premature system failure. For more information see *Air Conditioning and Refrigeration Industry Refrigerant Selection Guide 2003*, AIRAH, www.airah.org.au

Reclaiming refrigerant

'Refrigerant Reclaim Australia (RRA) is a not-for-profit organisation based in Canberra that works nationally with the refrigeration and air conditioning industry to share responsibility and costs to recover, reclaim and destroy ozone depleting and synthetic greenhouse gas chemicals.

RRA reports increasing amounts of refrigerants being collected annually, with more than 2,400 tonnes recovered and collected by June 2008. This equates to approximately 8 million tonnes of ozone saved and the equivalent of approximately 8 million tonnes of CO_2 emissions prevented. The work is not over yet – there are thousands more tonnes to collect across Australia.

RRA uses an Australian-developed plasma-arc technology and plant owned and operated by BCD Technologies to destroy refrigerants. This transforms fluorocarbon refrigerants, such as CFCs and HCFCs, to salts and water, with a higher than 99.999% efficiency.

In 2003, RRA expanded its recovery program to include the synthetic gases listed by the Kyoto Protocol, HFCs and PFCs, the collection and safe disposal of which is now mandatory.'

Refrigerant Reclaim Australia

Steps: Managing refrigerants

1 Review refrigerants and equipment used

Identify your baseline by carrying out a review of all the types of equipment and refrigerants used in each plant or system. You could use Worksheet 3.9A as a template for this review.

Develop a refrigerant register and keep it up to date. Use the register to record the type and quantity of refrigerants used and stored on the property. Worksheet 3.9B is an example register.

Use the refrigerant register, or similar, to account for any estimated or measured losses in refrigerants. Make sure building management reports acknowledge refrigerant losses and recommend remedial measures.

Include an evaluation of the refrigerant loss risks when undertaking regular HVAC inspections and maintenance.

2 Check contractors credentials

Make sure all contractors responsible for maintaining and installing equipment that uses refrigerants have the appropriate licence and registration, as required by government regulations.

Check maintenance specifications

Check that contractors' licensing requirements are included in the maintenance specifications for all HVAC equipment.

Check that the maintenance specifications also require contractors to take particular caution when handling refrigerants to avoid accidental losses.

Where to find an authorised organisation

The Australian Refrigeration Council Ltd (ARC) administers the licensing of refrigerants handling and authorised refrigerant trading organisations. You can find more information and search for a certified contractor on their website: www.arctick.org/index.php.

3 Check leak detection and containment systems

Refrigeration equipment should be located in moderately air-tight enclosures with a refrigerant leak detection system covering the high-risk part of HVAC plant such as chillers.

Where no refrigerant containment system is in place, or where containment may be inadequate, upgrade containment using the latest technologies to minimise refrigerant loss in the event of leakage or handling errors.

- Install refrigerant detectors where feasible.
- Specify that refrigerant dye be installed in compressors during maintenance activity, in accordance with manufacturer's advice, to assist in showing leakages.
- Where old CFC or HCFC refrigerants are used consider halide torch detectors.
- Leak detection systems should be installed and maintained where more than 100 kg of a refrigerant gas is located within one chiller unit in areas where ventilation is likely to be poor.

Using alternative or natural refrigerants

Alternative refrigerants such as ammonia, carbon dioxide and hydrocarbons are being used in specifically designed plant and equipment for suitable applications. Because they occur in nature, they are often referred to as the 'natural' refrigerants.

As alternatives to fluorocarbon refrigerants, natural refrigerants can also help to facilitate the heat transfer process, at the same time mitigating some of the environmental risks of global warming and ozone depletion.

These substances have been used as refrigerants for many years and they are now finding their way into commercial applications where fluorocarbons have previously been the preferred option.

Ammonia is widely used for cool stores and carbon dioxide is being trialled in some supermarkets and data centres.

While hydrocarbons are used on industrial and petrochemical sites, they were also trialled in ice-cream cabinets and drink fridges during the Sydney Olympics in 2000.

Where the application of natural refrigerants may not directly affect a commercial property at this stage, their uses will be relevant to the greening of the supply chain. See Section 5: 'Sustainability and the Supply Chain'.

For case studies about using natural refrigerants see www.airah.org.au/downloads/natural-refrigerants-case-studies.pdf

4 Develop a refrigerant management plan

Develop a plan to replace fluorocarbon refrigerants with alternative refrigerants. Seek to reduce storage of refrigerants to an absolute minimum, and eliminate it altogether if possible.

Keep informed about local and international advances in transition refrigerants and in adoption of natural refrigerants as replacements for synthetic ones. Government and industry websites and trade publications regularly provide updates on progress, issues and regulatory expectations.

Consult with equipment manufacturers and design consultants to better understand the feasibility of early retrofit of existing equipment with lower ODP and GWP refrigerant alternatives such as HFCs. Where feasible, include retrofit in cyclic maintenance or upgrade projects.

When major refurbishments or upgrades are planned and chillers are to be replaced, make sure the design team comprehensively evaluates the use of alternative low-impact synthetic or natural refrigerants and avoids specifying building materials which use fluorocarbon refrigerants in their manufacture, for example polystyrene materials that use fluorocarbons as a blowing agent. See Section 5: 'Sustainability and the Supply Chain'.

5 Recover refrigerants

Consider refrigerant recovery systems such as those that automatically pump refrigerants to a sealed tank or heat exchanger with isolation valves. Automatic systems can be more reliable and, unlike manual procedures, not subject to handling risks and resulting fugitive emissions.

Make sure all recovered refrigerants are sent to RRA. Note that RRA pays a rebate per kilo of returned refrigerant (see www.refrigerantreclaim.com.au).

6 Engage stakeholders

Provide advice to tenants about alternative refrigerants and proper maintenance practices associated with their supplementary HVAC equipment.

Raise staff and tenants' awareness of global warming and ozone depletion and suggest measures they could take, in addition to improved energy efficiency, to contribute to solutions. For example, suggest they avoid purchasing polystyrene cups made using synthetic refrigerants. See Section 5: 'Sustainability and the Supply Chain'.

Rewarding lower ODP and GWP

'The Green Star rating scheme rewards a range of initiatives:

- where refrigerants have to be used, selecting ones with zero ODP and GWP less than 10
- having leak detection systems
- using automatic refrigerant recovery systems
- using thermal insulation materials with zero ODP.'

For more information visit the Green Building Council of Australia's website: www.gbca.org.au

Recognising lower ODP and GWP

'The Australian Environmental Labelling Association (AELA) has developed voluntary standards to benchmark products or services as part of the Australian Ecolabel Program. If the standards are achieved a Good Environmental Choice Label is awarded. A standard has been developed for all categories of refrigerant products including domestic and industrial air conditioning refrigerants. A refrigerant qualifies for the Good Environmental Choice Label if it complies with:

- zero ODP
- GWP less than or equal to 50.

The Australian Ecolabel Program also has a standard for thermal building insulation materials which considers their ODP and GWP.'

For more information visit www.aela.org.au and www.geca.org.au

Further information

- *Air Conditioning and Refrigeration Industry Refrigerant Selection Guide 2003*, AIRAH, www.airah.org.au
- For licensing requirements for handling synthetic gases (refrigerants) and refrigerant trade: Australian Refrigeration Council, www.arctick.org/index.php
- *Australian Standard HB 40.1-2001: The Australian Refrigeration and Air-conditioning Code of Good Practice – Reduction of emissions of fluorocarbon refrigerants in commercial and industrial refrigeration and air-conditioning applications,* www.saiglobal.com/shop/script/Details.asp?DocN=AS624407634280
- The Australian Refrigeration Council Ltd. (ARC) administers the licensing of refrigerants handling and authorised refrigerant trading organisations: www.arctick.org/index.php
- For information on ozone and synthetic greenhouse gases, Montreal Protocol and regulations: Australian Government Department of Environment, Water, Heritage and the Arts, www.environment.gov.au/atmosphere/ozone/index.html
- Green Building Council of Australia:
  Green Star Office Design & Office As Built Version 3, 2008, www.gbca.org.au
- Good Environmental Choice Label, www.geca.org.au/standards/GECA%2026-2005%20-%20Refrigerants%20v1.2.pdf
- Australian Environmental Labelling Association (AELA), www.aela.org.au
- Refrigerant Reclaim Australia, www.refrigerantreclaim.com.au

Using refrigerants safely

Care should always be taken with refrigerants as they can have a range of toxicity and flammability risks. Refer to the AIRAH Refrigerant Selection Guide 2003 (www.airah.org.au).

With wider use of new technology and alternative refrigerants, people working in the refrigeration industry need to increase their practical and theoretical knowledge of alternative and natural refrigerants – particularly hydrocarbons. Make sure your contractors are up-to-date with the latest technical and safety information. Industry bodies such AIRAH can provide this information and training.

www.airah.org.au

Worksheets

Review and use these Word documents:

3.9A Refrigerant and equipment review

3.9B Refrigerant gases register

Worksheet 3.9A

Refrigerant and equipment review

This is an example only – adapt this worksheet to suit your organisation's requirements.

Property name:		
Property address:		
Name of refrigerant/HVAC contractor:		Contractor's licence number:
Review date:	Review prepared by:	Review approved by:

1 Equipment details
What is the age of the plant?
What is the life expectancy of the plant?
What refrigerant is used?
What type of lubricant is used?
What type of elastomers (rubber/plastic seals, gaskets etc.) and metals are used?
Describe other system components:
What is the compressor type? (e.g. hermatic, semi-hermatic or open drive)
Can the existing compressor be converted?
What are the system operating pressures?
Are there alternative refrigerants available that are suitable for the existing system operating pressures?
Are there alternative refrigerants available that are chemically compatible with the existing system? What is the likely impact on type of lubricant, elastomers (rubber/plastic seals, gaskets etc.) and metals used?
What is each system's required cooling capacity?
What is each system's shortfall or surplus cooling capacity?
Is refrigeration equipment located in moderately air-tight enclosures? Describe.
Is the refrigerant containment system adequate?
Is there a refrigerant leak detection system, maintained in good working order?
Is there more than 100 kg of a refrigerant gas located within one chiller unit in areas where ventilation is likely to be poor?

Does the refrigerant leak detection system cover the high risk parts of HVAC plant such as chillers?

2 Refrigerant usage
What is the total quantity of each chlorinated and alternative refrigerant being stored on site in the existing system and equipment? (Complete register in Worksheet 3.9B)
Is the system leaking refrigerant? (Refer to annual usage figures or leak detection system.)
What steps have been undertaken to stop leaks?

3 Management options	
❑	**Continue to use existing plant** [Only an option if the system is leak free.] A leak detection system is installed and an emergency plan is in place in case of system failure.
❑	**Leak reduction** A leak detection system is installed. Equipment must be replaced if it leaks.
❑	**Refrigerant recovery and reuse** Refrigerants from old plant that has been decommissioned must be recovered. Refrigerant should only be handled by a qualified refrigeration engineer or accredited technician.
❑	**Use alternative refrigerant** Replacement has low or zero ozone depletion potential (ODP) and low or zero global warming potential (GWP). Replacement refrigerant also has high efficiency and safety of use.

Source: Based on steps outlined in *Air Conditioning and Refrigeration Industry Refrigerant Selection Guide 2003*, Australian Institute of Refrigerants, Air Conditioning and Heating (AIRAH). For more information see www.airah.org.au

Worksheet 3.9B

Refrigerant gases register

This is an example only – adapt this worksheet to suit your organisation's requirements.
Retain register on building management records.

Property name:		
Property address:		
Name of refrigerant/HVAC contractor:		Contractor's licence number:
Register date:	Prepared by:	Approved by:

Existing refrigerants used						**Upgrade information**		
Plant/item description	**Location**	**Refrigerant**	**Quantity charged (kg)**	**Date charged**	**Estimated loss**	**Retrofit date**	**Retrofit cost**	**Alternative refrigerant**
		Total quantity on site (kg)		Total estimated loss (kg)				

Total summary	
Total quantity refrigerants stored on site (kg)	
Total estimated refrigerant loss (kg)	
Date measured	
Measured by (name)	

our environment it's a living thing

Department of Environment and Climate Change NSW

4

Sustainability and Project Delivery

Colonial First State

Global Asset Management

Department of **Environment & Climate Change** NSW

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4.0

Section 4 overview

This section provides ideas and tools to help integrate environmental and social sustainability into your project delivery for refurbishments or fitouts.

Spending capital funds to refurbish existing offices or new fitouts provides an opportunity to effectively integrate sustainability into your procurement process, and to strengthen the business case for sustainability. The benefits can be both direct and indirect (e.g. improved reputation or marketability resulting from good environmental performance) and become part of the value matrix.

Early decisions on identifying and integrating sustainability standards into the property cycle are more likely to result in the creation of long-term value. However, throughout the whole project delivery continuum there are key windows of opportunity for setting and achieving higher levels of performance based on sustainability standards.

Capital or recurrent funded development projects can provide the scale and momentum to support improved environmental and social standards. Whether a refurbishment, an upgrade or new fitout, sustainable development projects allow your organisation to demonstrate its commitment, comply with policy goals, engage with your stakeholders and achieve better standards.

This section does not set out to provide design solutions for environmental sustainability. Design solutions, standards and technical information for designers and managers working in the property industry are readily available elsewhere. Green building standards are increasingly demonstrating what can be achieved. Competencies in the use of these standards and their integration into project management is also increasing.

4.1 Sustainable building through design management

Explains how design management tools can help your design team and project managers set and achieve desired sustainability outcomes.

Worksheet 4.1A Sustainable Design Plan (SDP) template

Worksheet 4.1B Choosing the appropriate environmental rating tool

4.2 Sustainable building projects through tendering

Outlines the role of the tendering and contract documentation process in supporting your project's sustainable design intent.

Worksheet 4.2A Environmental specifications – building refurbishment and fitout projects

Worksheet 4.2B Environmental evaluation of project tenders

4.3 Sustainable fitouts

Suggests how you can use commercial fitouts as an opportunity to engage with your tenants and help them integrate sustainability into their fitout design and construction.

Worksheet 4.3A Checklist for sustainable fitouts

4.4 Sustainable base building refurbishment (retrofitting)

Provides guidance on assessing the current performance of the base building, scoping refurbishment (retrofitting) in accordance with good property fundamentals, changing tenant demand for green performance and the established environmental rating tools.

4.5 Reporting sustainability outcomes

Provides a template for listing the benefits of completed projects to help you promote these outcomes to key stakeholders.

Worksheet 4.5A Project completion sustainability report

Project delivery process

The project delivery process for building projects and upgrades provides many opportunities for adding or better defining sustainability practices:

1 Planning
- Establish sustainability vision and goals
- Build sustainability cost allowance into project budget

2 Concept design
- Identify key responsibilities
- Develop initial sustainable design plan

3 Commissioning
- To ensure the targets are achieved include commissioning expertise from project inception and scoping through to ongoing management of the completed and rated project

4 Detailed design
- Explore design options and undertake cost benefit analysis
- Update sustainable design plan

5 Tender documentation
- Determine tender environmental specifications
- Determine environmental management provisions to be included in the contract

6 Tender evaluation
- Include sustainability in tender evaluation criteria
- Review tenderer's outline Environmental Management Plan

7 Contract administration
- Ensure contractor's detailed Environmental Management Plan is satisfactory (and Waste Management Plan if applicable)

8 Occupation
- Prepare project completion sustainability report
- Negotiate green leasing arrangements
- Conduct post-occupancy environmental evaluations

Sustainable building through design management

4.1

Context

The design process – and good design – is critical to sustainability. This section contains advice about how to manage the design process for building refurbishment or fitout projects to support your organisation's sustainability goals. This applies to any form of commercial construction, whether:

- starting a new development on a greenfield or brownfield (previously developed) site
- refurbishing an existing base building (also called retrofit), or
- constructing a new tenancy fitout or deconstructing and rebuilding a fitout for an existing tenancy.

A project's design phase is the primary context for selecting the options and initiating the actions that will determine whether your refurbishment or fitout will result in a property that is sustainable in the short and long term. Your sustainability initiatives must be included from the outset because they cannot easily be added later. Optimum environmental and social outcomes are more likely if your design process is guided by a structured and accountable approach, rather than relying on a designer's inherent capabilities or including general statements about aspirations in a project design brief.

Sustainable Design Plan (SDP)

One approach to help integrate sustainability criteria into your design process is to use a project management tool such as a Sustainable Design Plan (SDP). Elements from an SDP can also be incorporated into other project management tools as your project team's experience in incorporating sustainability issues develops.

An SDP applies to your design and contract documentation phases. Its purpose is to set, track and record progress against your project's sustainability objectives. An SDP can also provide a vehicle for:

- transferring design intentions through to a project's construction and operational phases
- increasing end users' awareness of sustainability features and helping to transfer to them the responsibility for effectively managing those features.

What's in this section

An SDP does not replace the use of environmental rating tools for buildings, such as NABERS or Green Star. Rather, it presents your desired building performance attributes in a format that allows your project manager, or other design team members, to:

- assign accountabilities
- track progress
- record decisions made and the rationale behind them.

Worksheet 4.1A contains a template you could use as the starting point for project managing the sustainability aspects of your building design process. This template could be applied to any commercial or retail property base building refurbishment (retrofit) or tenancy fitout.

Steps: Integrating sustainability into the design process

The following steps can be integrated into existing planning and evaluation processes.

1 Establish the sustainability vision and goals

Achieving recognised ratings such as NABERS and Green Star is generally seen as being critical to the owner's ability to lease or sell the buildings. The market recognises the star ratings, even if they do not understand the detail of how ratings are calculated.

Defining the goals

Goals and other desired outcomes – such as specific performance targets (e.g. energy efficiency improvements of 20% above portfolio average NABERS and Green Star rating) – could be defined in a workshop situation. The participants could include:

- a recognised sustainability facilitator or environmental practitioner who is able to set the context for sustainability in the relevant marketplace
- your project team, e.g. architects, services consultants, structural engineers, quantity surveyors, commissioning agent
- the client or owner of the project
- if an external service provider is to be appointed to manage the property, a representative of the proposed property management organisation
- if the project is to be leased or sold, a representative of the organisation that will be selling or leasing the property.

Using sustainable design plans

'The Colonial First State Global Asset Management Sustainability Manual provides instructions for fund, portfolio and development managers about how to use sustainable design plans (SDPs) in the design and delivery of new buildings and major refurbishments.

The purpose of SDPs is to:

- facilitate a process for identifying project sustainability objectives and integrating them into the design process
- track and monitor design team progress, including the rationale behind decisions that influence the project's ability to achieve its sustainability objectives
- record the outcomes of design or product investigations (for knowledge-transfer purposes) and
- increase awareness of Colonial First State Global Asset Management's commitment to property sustainability in the design and contracting market.

SDPs are mandatory requirements on all capital projects in excess of $2.5 million, and projects over $150 million in total have SDPs as part of their delivery process. Examples include 259 George Street, Sydney; 1 York Street, Sydney and 367 Collins Street, Melbourne.

Project outcomes include:

- increasing diversion of demolition waste from landfill
- using materials with a high percentage of recycled content
- specifying waterless urinals
- increasing use of energy efficient lighting
- avoiding toxic materials
- increasing the potential NABERS ratings (Energy, Water and Waste)
- achieving Green Star credit points.'

Colonial First State Global Asset Management, www.cfsgam.com.au

Even if leasing or selling agencies have not been appointed at this stage their objectives can be set now – to be worked into a contract later on. It's important to involve the full project team in this workshop session because the decisions may involve all the various disciplines.

When defining sustainability goals, your analysis should include the whole-of-life operational savings that will result from achieving a green building standard, as well as the costs and benefits of each initiative. The goals could be set out as aspirations with an agreement to strive for the best possible result within the resources available.

Evaluating the business case

When deciding which sustainability goals to pursue, evaluate the business case as described in Section 3.1: 'Incorporating sustainability into decision making'. This will help to establish a logical and reviewable framework for making decisions.

Remember to test the outcomes so that your goals and the resulting scope of works:

- are coordinated to perform to grades or ratings
- meet your strategy for the building or tenancy
- meet market demand.

Provide a broad timeframe and plan for each goal, including a priority list.

2 Incorporate goals into the building project briefs

The project brief, project manager's brief and design consultant's brief all need to set out:

- the agreed sustainability goals and targets, including NABERS and Green Star ratings
- the key performance indicators that will be used to measure achievements in relation to these goals and targets
- the roles and responsibilities of the project manager, design team and sustainability facilitator or environmental practitioner.

The SDP could be the formal link between design work and your sustainability goals. (The alternative is to incorporate the sustainability goals into other existing project management tools.) Where an SDP will be used as a project management tool make sure your design team understands this from the outset.

Check against industry tools from the start

If you intend to have the project Green Star or NABERS rated, or graded against the Property Council of Australia's *A Guide to Office Building Quality*, then use their tools and guides from the outset and refer to them regularly to make sure the project complies with them where possible. It's difficult to reverse or correct early decisions at a later stage.

For example, under Green Star, the early engagement of a commissioning agent is important. If this is missed, you may lose the opportunity to achieve some of the commissioning points.

If you are entering into a Commitment Agreement for a NABERS Energy rating, this should be done in the earliest stages of a project, while it is still possible to make adjustments to the design.

Use the tools as checklists

Use the NABERS and Green Star categories and tools as checklists. The Green Star Credit Summary Tables provide an excellent document that can be used as a checklist to ensure that most aspects of sustainability have been considered.

For NABERS see www.nabers.com.au

For Green Star see www.gbca.org.au

For the PCA's *A Guide to Office Building Quality* see www.propertyoz.com.au

3 Develop a Sustainable Design Plan

Before any design work begins, your project manager (or design manager) needs to adapt the generic SDP template (Worksheet 4.1A) to suit the project scope and the agreed sustainability goals. Any aspects of performance and desired environmental outcomes ('design intent') agreed to previously should be included in the SDP, with a clear instruction that your design team needs to collaborate as necessary to achieve these goals.

To support this process, get your project manager and design team together to review the environmental or other risks associated with non-delivery or under-achievement in relation to the sustainability goals and targets.

If you have the support of all parties, this does not need to be quantified, but qualified. The environmental goals and aspirations can be broad – put your time and energy into moving forward with the appropriate, environmentally sensitive design plan and selecting the appropriate ratings tool. Before the first design team meeting:

- ask your design team to review the SDP template and add any 'actions to be taken' (See Worksheet 4.1A), and then
- ask your project manager to review the actions, compile the project's draft SDP, and comment on the plan's comprehensiveness and practicality.

Review and refine the SDP to make sure it covers all relevant areas and is appropriate for the scope of the project and your sustainability goals. A sustainability facilitator could help with this task.

At the design team's first meeting, ideally before the project brief has final approval, discuss the SDP to refine the actions and confirm the responsibilities. Once all the applicable sections of the SDP have been compiled, seek final approval.

Once formally accepted, the SDP becomes the agreed Project Management Tool for facilitating sustainable design during the design and documentation phase of your project. As such, make sure it is included in the normal project management process undertaken by your project manager and used as a reference tool during design meetings.

4 Implement the SDP

Use the SDP to monitor the project's design development and check whether the project is on track to achieve the required sustainability goals. Comprehensively record all actions, outcomes and decisions relating to sustainability during the design phase. In particular, the capacity to achieve the sustainability goals and targets should be assessed and

Fostering innovation

Encourage a culture of innovation within your design team, so that all possible options for achieving the sustainability goals can be explored. Options that might require senior management comment or agreement should be presented as part of usual project management procedures, supported by information about capital costs, whole-of-life costs and whole-of-life benefits. In some cases it will be appropriate to use life cycle assessment techniques to present the environmental costs and benefits.

reported on. Other documentation, e.g. supplier's product statements or outcomes of building investigations, may also be appended to the SDP. (See Section 5: 'Sustainability and the Supply Chain'.)

Reviews and updates

Review and report on the SDP progressively during the design and contract documentation phases and update it as required. Assess which sustainability benchmarks (e.g. energy efficiency performance or material selection) are on track and which goals can be achieved within the project budget. This may involve changes to the design. It's also important to feed this information back through your project team.

If your design team's brief is to achieve a desired environmental rating then it's crucial that progress towards this goal is reviewed. The team should periodically carry out a test rating of the project to track progress by using a comprehensive checklist, e.g. the Green Building Council of Australia have one in their design tool, titled 'Credit Criteria' (see gbca.org.au). Note that while a NABERS Energy rating cannot be obtained until you have at least 12 months' energy data after the building has been substantially occupied, it is possible to sign a Commitment Agreement to achieve a future rating. This allows you to promote the future rating from the outset of a project. See www.nabers com.au for more information.

Encourage design team members to regularly review their actions and update the SDP as necessary so that it accurately reflects progress and outcomes. As a minimum, review and update the project's progress against the SDP at the following stages:

- confirmation of the design brief
- 50% design stage
- 95% design stage
- 50% contract documentation stage
- tender stage.

Add an updated copy of the SDP to the project file at each of these stages so it's available when required.

Before going to tender, the relevant design team members should sign off the final SDP as confirmation that all tasks have been completed as described in the plan. Make sure the completed SDP is accompanied with sufficient documentation to support an application for a formal environmental rating such as Green Star or NABERS.

Managing knowledge

It's important the SDP also records outcomes or decisions about why a particular goal or target could not be achieved. This will help to support the knowledge management process between all the team members.

Capacity building

When used effectively, the SDP can facilitate transfer of knowledge right through to documentation for handover to occupants and other end users. This could be prepared as a Building Users' Guide or information for tenants. It can also support transfer of knowledge within a property or design organisation and between various property projects.

Benefits of experience

Using a contractor with sustainability experience can be of benefit to the project. As an example, using contractors with ISO 14001 certification may enable you to gain additional points under Green Star.

Involving the contractor

Include a completed, final SDP in the tender and contract documentation to be provided to the successful building contractor. This will help to facilitate your contractor's awareness and compliance during the construction phase.

Many building projects use a design and construct contract or guaranteed maximum price contract where the project is not fully documented prior to tender. Care must be taken where there are strict sustainability requirements. There may be benefit in involving your contractor before the construction documentation is finalised to contribute construction expertise to your project team and deal with issues such as buildability, choice and availability of materials and constraints from existing structures and services.

Encourage your contractor to incorporate key aspects of the SDP into their project management system and to progressively report on performance against the intent of the SDP, as well as on any specific contract requirements related to the project's sustainability goals.

5 Monitor the SDP during the construction phase

Monitor the project performance during the construction phase to ensure everything is on track to achieve the required sustainability goals. This is particularly important where non-delivery of sustainability initiatives could significantly impact on the project's creditability or achievement of the chosen rating. Include review of environmental performance as a subject in project site meetings.

6 Report sustainability achievements

At the end of the project report and evaluate the sustainability outcomes. This will enable you to compare achievements against the goals and make sure that lessons learned are available for future projects. See Section 4.4 on reporting sustainability outcomes.

Further issues to consider

A tool, not a statement of objectives

An SDP is not a substitute for sustainability standards in your project design brief. Your approved project brief should describe or quantify the desired sustainability objectives for the project e.g. to achieve a 5 star NABERS Energy rating or to set a new benchmark in green building performance. The SDP is a tool to help achieve these objectives.

Record the rationale

Your SDP should record decision-making processes and why certain actions or design elements (whether included in the budget or not) were or were not integrated into the tendered design. This is especially desirable where further investigation is required, e.g. finding more information about the energy performance of various chiller options or the air emissions of a particular flooring product. The SDP records the outcomes of such investigations and your rationale behind decisions made.

When is it mandatory?

You can set thresholds above which an SDP should become a mandatory component of your design process. There is no prescriptive benchmark to follow, other than to acknowledge that improved project design can lead to improved outcomes no matter what your project's capital cost. Whether an SDP is applicable depends on how you perceive the risk of NOT achieving sustainability performance. Your achievements can be quantified using the NABERS or Green Star rating tools. However, sustainability measures must be maintained because the smallest job not carried out to your sustainability standards can damage the environmental performance of your property.

Worksheets

Review and use these Word documents:

4.1A Sustainable Design Plan (SDP) template

4.1B Choosing the appropriate environmental rating tool

Worksheet 4.1A

[Project name]

Sustainable Design Plan

This is an example only – adapt this worksheet to suit your organisation's requirements.

Working document—initial schematic design stage

Compiled for [name of Design team leader] by [name of Sustainability Facilitator]

Date of issue to Project Manager:	Last review date:	Design Manager approval: date	Project Manager approval: (completion of all actions) date

Using this template

Guidelines for using this template are included here and in Section 4.1 of the DECC NSW Sustainable Property Guide.

This Sustainable Design Plan (SDP) template could be applied to any commercial or retail property base-building refurbishment (retrofit) or tenancy fitout.

Adapt this generic SDP template to suit your project. Adaptations might include adding references to Green Star, NABERS, the Property Council of Australia's (PCA) *A Guide to Office Building Quality* or other performance categories which will help achieve the project's sustainability vision.

This SDP will be retained as a project management record of commitments at schematic design stage and will be progressively updated as investigations proceed, decisions are made and outcomes are progressed during the design and contract documentation phases.

Importantly, information should be provided in sufficient detail to explain why initiatives have been incorporated and why others have been considered, investigated and discounted. Wherever possible, likely outcomes or benefits (e.g. energy/CO_2 savings, potable water savings) should be quantified, based on a traditional design approach.

Aim: To stimulate, track and record the sustainable design process and to ensure every reasonable effort is made to support the project's environmental and social sustainability goals.

Model: The content of the SDP may be guided by a building environmental rating tools e.g. the Green Star or NABERS rating system.

Sustainability intent: The 'design intent' listings in the SDP are a result of a sustainability workshop. They represent the desired sustainability goals for this project.

Design team responsibility: Review relevant sections and add information to Column B 'Design team actions' to record actions that will be taken during the design, design development and contract documentation phases to achieve the design intent. Actions will be discussed and confirmed at the first team meeting.

Sustainability Facilitator responsibility: Progressively record status of actions, investigations and decisions made against each action item. Include options presented for approval and resulting decisions. Quantify expected environmental or social benefits wherever feasible.

[Company name] is responsible for maintaining this SDP, seeking updated information from the design team and providing advice to the Design Manager as necessary to ensure an appropriate record of the sustainable design decisions on this project are maintained for project and client purposes.

[name of Sustainability Facilitator/Environmental Practitioner]

[Contact details]

Appropriate benchmarks (examples)

Identify a set of appropriate design benchmarks against which this project can be compared. Design objectives may exceed these benchmarks. Individual criteria from tools may be used.

Benchmark examples	Source
2 star NABERS Energy	Current accommodation
2.5 star NABERS Energy and 4 star Green Star	Current portfolio average
3.5 star NABERS Energy	Competitors recent achievement in this market
1 star NABERS Water	Current accommodation
1.45 kL/m^2 NLA pa potable water	Current accommodation
No refrigerant containment	Current accommodation
22% tenant waste recycling	Current accommodation
67% construction waste diversion from landfill	Last development
tenant complaints regarding comfort and air quality reduced to 57% of all complaints	Last development
313 mJ/m^2/pa base building energy consumption – Sydney best practice	Property Council of Australia
Other: NABERS Waste NABERS Indoor Environment PCA *Guide to Office Building Quality*	

List key agreements and actions arising from the sustainability workshop (if undertaken)

Project context

Identify information that sets the context for sustainable design objectives and design team actions. Examples may include:	
Have outcomes of the feasibility study been provided to design team?	yes/no
Have key findings of the contaminated site investigation been provided to design team?	
Have sustainability objectives been stated in the project brief?	
Has a tenant agreement been entered into to provide a specific level of environmental quality?	

Key people involved	
Client Representative	[name]
Project Director	[name]
Project Manager	[name]
Design Manager	[name]
Sustainability Facilitator/ Environmental Practitioner	[name]

Sample only: how the tables work

A Design intent	**B Design team actions**	**C Resp.**	**D Status and outcomes**	**E Indicators**	**Complete**
Briefly describe the design intent in regard to sustainability, item by item.	For each design intent, list actions proposed or agreements made by the design team at the initial concept design workshop.	Identify who is primarily responsible for carrying out the agreed actions. List key supporters if necessary.	Update this section as design and documentation work progresses.	Identify performance indicators for areas of responsibility. May relate to agreed 'green building' indicators. These indicators will provide information for promoting the outcomes to key stakeholders.	Sign off when complete.

Integrated design

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
Examples: Achieve an effective and collaborative design process by engaging the multiple design disciplines, as well as owners, users, contractors, facility managers and operations personnel.					
Establish project environmental and social performance goals and use these as the basis for selecting and implementing related building design, construction and operational strategies.					

Sustainable site

Describe the environmental features of the site, including proximity to public transport, Green Star credits and any limiting factors or likely DA conditions.

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
Examples: Reduce the environmental impact of the location of the development on adjacent residential or business communities.	List actions that will optimise environmental and social outcomes of site development. Refer to any environmental studies (or site contamination studies) and resulting required mitigating actions relating to design work.				

Sustainable site

Describe the environmental features of the site, including proximity to public transport, Green Star credits and any limiting factors or likely DA conditions.

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
No adverse visual impact when viewed from neighbouring areas.					
Undertake site remediation and rehabilitation as required to optimise site use and eliminate health hazards.					
Conserve, protect and enhance existing natural areas and restore damaged areas providing environmental habitat.					

Water efficiency

Describe the appropriate performance benchmark to measure outcomes against e.g. local water authority best practice, Green Star credits or NABERS Water rating, or current accommodation water efficiency.

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
Examples: Eliminate use of potable water for HVAC equipment cooling.			As above	As above	As above
Limit or eliminate the use of potable water for landscape irrigation.					
Reduce generation of wastewater and potable water demand through innovative water demand technologies.					

Water efficiency

Describe the appropriate performance benchmark to measure outcomes against e.g. local water authority best practice, Green Star credits or NABERS Water rating, or current accommodation water efficiency.

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
Maximise potable water usage efficiency to reduce burden on municipal water supply and wastewater systems.					
Achieve a NABERS Water 4 star rating.					
Through sub-metering, provide for ongoing accountability and optimisation of building water use efficiency over time.					
Reduce use of process water—use building system equipment with low-flow or no-flow water use. Reduce or eliminate use of potable water for non-potable processes.					
Use 5-star WELS rated water efficient appliances throughout.					
Use waterless urinals throughout.					

Energy and atmosphere

Describe the appropriate performance benchmarks to measure outcomes against e.g. Green Star credits; NABERS Energy rating, PCA Quality or current accommodation energy efficiency.

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
Examples: Establish the minimum level of energy efficiency for the building and systems.	List specific actions by specific members of the design team to achieve design intent				
Reduce use of non-renewable energy sources through increased energy efficiency of building services and lighting.					
Achieve a performance comparable to 5 star NABERS Energy (base building).					
Investigate use of renewable energy technologies to reduce fossil fuel use by 10%.					
Ensure that fundamental building elements and systems are designed, installed and calibrated as intended.					
Reduce ozone depletion potential and global warming potential through careful selection of chillers and their refrigerants.					

Energy and atmosphere

Describe the appropriate performance benchmarks to measure outcomes against e.g. Green Star credits; NABERS Energy rating, PCA Quality or current accommodation energy efficiency.

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
Provide for the ongoing accountability and optimisation of building energy consumption performance over time.					

Materials and resources

Describe the appropriate performance benchmarks to measure outcomes against e.g. Green Star credits, emerging good practice or best practice trends or client's current accommodation recycling performance.

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
Examples: Conserve material resources by minimising initial resource use and designing for flexibility and ease of adaptation for future uses.	List specific actions by specific members of the design team to achieve design intent				
Divert at least 90% of construction and demolition waste materials from landfill through recycling and reuse.					
Reduce operational phase solid waste to landfill by designing effective recycling facilities for tenants.					

Materials and resources

Describe the appropriate performance benchmarks to measure outcomes against e.g. Green Star credits, emerging good practice or best practice trends or client's current accommodation recycling performance.

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
Reduce ozone depletion potential and global warming potential by preventing refrigerants leaks and through careful selection of materials.					
Use materials with a recycled content.					
Encourage environmentally responsible forest management through use of certified timbers.					
Ensure life-cycle impacts are identified in material selection.					

Indoor environmental quality

Describe the appropriate performance benchmarks to measure outcomes against e.g. Green Star credits, NABERS Indoor Environment, NHMRC thresholds, or current accommodation

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
Examples: Provide a high level of control over temperature and ventilation or lighting systems for occupants to promote their productivity, comfort and wellbeing.	List specific actions by specific members of the design team to achieve design intent				

Indoor environmental quality

Describe the appropriate performance benchmarks to measure outcomes against e.g. Green Star credits, NABERS Indoor Environment, NHMRC thresholds, or current accommodation

A Design intent	B Design team actions	C Resp.	D Status and outcomes	E Indicators	Complete
Establish minimum indoor air quality (IAQ) performance requirements to prevent the development of IAQ problems.					
Provide capacity for IAQ monitoring during occupation to sustain long-term safety and comfort.					
Provide for the effective delivery and mixing of fresh air to support occupants' safety, comfort and wellbeing.					
Reduce emissions of indoor air contaminants from materials that are odorous, potentially irritating or harmful to the comfort and wellbeing of installers and occupants.					
Avoid materials or products with urea-formaldehyde resins.					
Avoid all fitout or building materials which off-gas VOCs.					
Use very low-VOC finishes throughout.					
Avoid using furnishings that may foster allergens or dust mites.					

Worksheet 4.1B

Choosing the appropriate environmental rating tool

Environmental rating tools fall into two categories:

1 Those used to validate the environmental initiatives of the design phase of a:

- new building
- base building refurbishment / retrofit, or
- fitout / interiors.

These validate that the environmental initiatives proposed in the design phase have been implemented.

2 Those used to assess a building's environmental impact when in use.

Tools for the design phase

Green Star

Green Star ratings, managed by the Green Building Council of Australia, are used to assess the design of a building against various environmental criteria. The following rating tools are available for new buildings and those undergoing substantial refurbishment:

- Green Star Office Design and As-Built
- Green Star Interiors (internal fitout)
- Green Star Retail (shopping centres)
- Green Star Education

Other rating tools are being developed.

NABERS

NABERS ratings, managed by the Department of Environment and Climate Change NSW (DECC), measure the actual impact of an existing building in operation. However, it is possible to use the NABERS Energy tool to predict the future performance of a building. Developers and builders can promote the energy efficiency of their proposed buildings by entering into a Commitment Agreement with NABERS.

The NABERS Energy Commitment Agreement allows developers and building owners to promote and market excellent greenhouse performance of new and refurbished office buildings from the outset. The Commitment Agreement will state a commitment to design, build and commission the premises to 4, 4.5 or 5 star performance. The project undergoes a careful review process to ensure that it is able to meet the agreed performance level.

Tool for buildings in use

NABERS

DECC has established the NABERS ratings for assessing the performance of existing buildings based on their historical measured operational impacts on the environment. Ratings are available for office and hotel buildings, and ratings for other building types are under development.

NABERS can be used to rate offices and hotels in the following categories:

NABERS can be used to rate offices in the following categories:

NABERS Ratings	Offices	Hotels
Energy	Yes	Yes
Water	Yes	Yes
Waste	Yes	No
Indoor Environment	Yes	No

Further information

For more information visit:

www.gbca.org.au

www.nabers.com.au

Sustainable building projects through tendering

4.2

Context

This section contains advice about how to use the tendering process for building refurbishment or fitout projects to support your organisation's sustainability goals.

Project tendering, tender evaluation and contract administration are critical processes for delivering the sustainable or 'green building' outcomes established as design goals during the building or fitout design phase (See Section 4.1: 'Sustainable building through design management'). By detailing your expectations in regard to performance standards and sustainability, and by vetting prospective contractors, the tendering process has a crucial role in maintaining desired environmental and social outcomes in the long term. As well as detailing your requirements, the tendering process needs to help contractors, managers and suppliers understand the role they will be expected to play in supporting the required environmental and social outcomes.

For day-to-day purchasing of goods and services, sustainability goals can be supported by developing and implementing a purchasing policy that includes sustainability provisions. (See Section 5: 'Sustainability and the Supply Chain'.)

What's in this section

Steps: Integrating sustainability into the tendering process

The following steps can be integrated into your organisation's standard project procurement processes.

1 Determine thresholds

Determine the threshold at which sustainability criteria and performance standards will be included in tender and contract specifications.

The following thresholds are examples only:

Project scope	Threshold for sustainability provisions
New developments	All 'main contractor' construction tenders
Building fitouts or refurbishments	All tenders over $200,000 value
Building services equipment upgrades	All tenders over $200,000 value

To determine this threshold consider:

- potential environmental risk from demolition and construction activities
- risk to the project's sustainability goals
- the impact on your organisation's sustainability objectives and commitments.

2 Adapt tender documents to include sustainability provisions

Instruct the documentation team to include sustainability provisions in the tender documents. To follow an example, the team could refer to the environmental specifications set out in Worksheet 4.2A and adapt them to suit the contract style and the scope of work being tendered. Social aspects such as OH&S, employment conditions and community initiatives can also be included.

Worksheet 4.2A is adaptable for use in all construction tenders – tenancy fitouts or base building refurbishments (retrofits) of existing commercial or retail buildings. These requirements are not intended to replace or override any other environmental or contractual requirements of the tender or contract. (Clause numbering should be amended to suit the tender structure.)

Schedule of Environmental Management

The specifications include a Schedule of Environmental Management. This requires the tendering company to provide information about its experience, capability and approach to environmental management on the project. The tenderer's response to this Schedule provides the information required for the tender environmental evaluation.

Environmental Management Plan (EMP) or Waste and Recycling Management Plan (WMP), or both

The model specification calls for the tenderer to define the need for either an Environmental Management Plan (EMP) or Waste and Recycling Management Plan (WMP), or both. In general, an EMP can include a WMP. However, the option exists for the tenderer to be required to provide a separate WMP in situations where waste management is a key environmental risk e.g. demolition contracts or upgrades of base building services.

Outline only

The model specification calls for the tenderer to include an **outline** EMP or WMP (or both). This outline should include an overview only of the structure and scope of issues to be addressed and the general approach to be taken to integrate the EMP or WMP into the tenderer's project management procedures. It is not expected to include significant project-specific detail on methodology, actions, work instructions or progress reporting. After the tender has been awarded, the selected contractor will be required to complete the EMP or WMP in sufficient detail to enable it to be approved for use.

Responding to enquiries

Make sure there is a process in place to respond to and record queries or concerns expressed by prospective tenderers.

3 Include sustainability in the evaluation process

Set up a consistent process for evaluating tenders. This includes establishing weightings for the various environmental sustainability criteria which reflect their relative importance and level of risk. To follow an example use an evaluation form such as Worksheet 4.2B. Worksheet 4.2B is based on the provisions set out in the Worksheet 4.2A: 'Environmental specifications – projects' and is designed to be used to record and assess the tenderers' responses to key sustainable contracting and project delivery requirements. The evaluation can be applied to a pre-qualification process or to a tender response. In both cases, the form needs to clearly list the requirements to be responded to.

Importantly, this evaluation is intended to support the selection of the most appropriate contractor and identify commitments made during the tendering stage which should be included in the contract agreement. This evaluation should supplement any other evaluation undertaken to enable a procurement decision to be made.

Although the evaluation form is designed for any construction contractor, allowance should be made for the assessment of small companies or companies providing a very limited scope of services.

The evaluation form is intended to be selective and easy to use. However, where environmental or social risks are significant, or key areas of performance are required, the checklist should be expanded to deal with some areas in more detail. For example, standard OH&S components could be expanded to include other social issues such as labour practices, and additional detail about project experience or waste management capabilities could be requested, etc.

If necessary, ask a tenderer to provide further information to clarify or support their tender response. Make sure the tenderer understands that, if insufficient information is provided to enable an adequate assessment, the tender may be rejected. Keep all documents associated with the selected tenderer for future reference.

Worksheets

Review and use these Word documents:

4.2A Environmental specifications – building refurbishment and fitout projects

4.2B Environmental evaluation of project tenders.

Worksheet 4.2A

Environmental specifications – building refurbishment and fitout projects

This is an example only – adapt this Worksheet to suit your organisation's requirements.

This worksheet contains inserts which can be adapted and used in the tender and contract specifications for building refurbishment and fitout projects.

The desired outcome is to ensure both the tender selection process and the execution of the works appropriately address the environmental and social risks attributable to the project. See Worksheet 4.2B for environmental evaluation criteria for project tenders. This has been adapted from the original text by Colonial First State Global Asset Management.

Part A: Inclusions for conditions of tendering and preliminaries

Environmental management

Background

The [*project owner or principal under the contract*] is committed to maximising environmental and social sustainability outcomes within the properties it owns and manages.

The construction or refurbishment of commercial [and retail] properties entails environmental and social impacts related to:

- energy and water consumption
- pollution
- waste discharges, and
- the manufacture and installation of building materials.

The [*project owner or principal under the contract*] is therefore obligated to take all reasonable measures, through the execution of this contract, to mitigate these impacts.

The [*project owner or principal under the contract*] therefore requires tenderers to be aware of its environmental management requirements and to take active measures as described in this tender to adequately address these impacts in response to this tender.

Consequently, this tender includes [XX, identifier number] **Schedule of Environmental Management** (Attachment 1 – page 5-6 of this document) which is to be completed by the tenderer and returned with the Tenderer's response.

Failure to submit a response to [XX] Schedule of Environmental Management will constitute a non-conforming tender.

Key terms and outcomes

Notwithstanding any other requirement in the contract, the [*project owner or principal under the contract*] requires all construction works associated with its properties or projects to take adequate consideration of and demonstrate compliance with the following outcomes:

- efficient use of energy including electricity, gas and other forms of energy consumed in the property

- conservation of water and promotion of water and wastewater recycling and reuse
- avoidance of materials or construction processes that are toxic or create undesirable emissions or discharges
- reduction of solid waste from construction activity being disposed of in landfill through increased reuse, recycling and waste avoidance practices
- compliance with all relevant Federal and State environmental laws, regulations and standards of good practice, as well as local government development approval conditions.
- the implementation of a structured and systematic process within construction projects to achieve the above and demonstrate an adequate level of environmental due diligence, and
- if specified, the completed works will achieve the desired Green Star rating or NABERS rating (including NABERS Energy).

Tender requirements

All Tenderers are required to provide:

1 details of relevant experience – listing projects and briefly describing relevant experience brought to this project

2 a minimum of two written references from current or previous clients where the Tenderer undertook a similar scope of work

3 a copy of the Tenderer's Environmental Policy (or similar)

4 a copy of the Tenderer's Environmental Management System (EMS) or similar system that details:
  – how environmental risks are managed within the Tenderer's business activities (not limited to this project)
  – the approach to identifying responsibilities for environmental management within the Tenderer's company
  – the nature and extent of environmental awareness and skills training provided to staff and contractors, and
  – measures implemented by the tenderer to monitor and report on the company's environmental performance.

5 details of the Tenderer's understanding of sustainability in relation to the Australian construction industry and of the National Australian Built Environment Rating System (NABERS) and/or the Green Building Council of Australia's Green Star rating system

6 details of the Tenderer's performance in relation to environmental regulations over the last five years including any judgements against the tenderer under any State or Federal environmental legislation

7 details of the Tenderer's environmental and social sustainability reporting (including corporate responsibility and governance initiatives)

8 details of the Tenderer's environmental performance and experience on similar projects with respect to the key outcome areas noted in this tender, section [XX] Schedule of Environmental Management.

9 details of the Tenderer's proposed approach to environmental management of the works under the proposed contract, specifically: [one or both of the following]:

  a) an Outline Environmental Management Plan (OEMP). The OEMP should be an **overview** only of the approach to be taken to achieve a high level of performance in project outcomes including energy efficiency, water conservation and reuse, waste management, noise management, indoor

air and environment quality, pollution minimisation and, where defined in the contract, the project's target environmental ratings. The OEMP should include an overview of the allocation of responsibilities within the Tenderer's team, training of staff, management of subcontractors' environmental performance and project monitoring and progress reporting.

b) an Outline Waste and Recycling Management Plan (OWMP) including an **overview** only of the approach to be taken on waste minimisation, reuse, recycling and waste disposal by the Contractor, and any subcontractor or supplier managed by the Contractor, including actions to be taken to divert waste from disposal.

10 details of the Tenderer's intention to comply with an Environmental Impact Assessment (EIA) or Social Impact Assessment (SIA) where required

[Note to contract documenter: Include both (a) or (b) above, or choose one of them, subject to the scope of work and extent of potential environmental risks. Confer with the project manager for direction as necessary.]

Note to tenderer:

The Outline [EMP/WMP] is to include an **overview** only of the structure and scope of issues to be addressed and the general approach to be taken by the tenderer to integrate the plan into the Tenderer's project management structure. It is not expected to include significant project-specific detail on methodology, actions, work instructions, progress reporting etc. Providing a copy of a similar plan for a previous project by the tenderer would be helpful.

The selected Contractor will be responsible for completing the plan in sufficient detail to enable it to be approved for use by the Superintendent or Client's Representative prior to commencement of the Contract.

Part B: Contract requirements – Environmental Management

Note: This section contains the additional environmental requirements that the successful Tenderer (the Contractor) must comply with during the course of the contract.

XX–01: Detailed Environmental Management Plan (DEMP) [or Detailed Waste and Recycling Management Plan (DWMP)]

The Contractor shall be required to prepare and implement, to the satisfaction of the Superintendent or Client's Representative, a detailed Environmental Management Plan (DEMP), or where agreed, a detailed Waste and Recycling Management Plan (DWMP).

No contract activities, other than those deemed by the Superintendent as not having any environmental consequence, shall commence until the completed DEMP or DWMP is accepted by the Superintendent.

The DEMP shall address all environmental performance areas and environmental outcomes described or specified in the contract with particular reference to key performance areas such as environmental ratings or other defined initiatives in energy and water conservation, waste minimisation; noise and dust mitigation, indoor air quality, protection of the natural environment, as well as compliance with any relevant or applicable statutory environmental requirements.

The DEMP shall also include:

- standard work practices that manage risks in these key performance areas, and
- measures the Contractor will take to monitor, audit and report progress to the Superintendent.

The DEMP shall be an integral component of the Contractor's project management system, and progress against it will be regularly reviewed by the Superintendent.

Where required within the DEMP (or where agreed as being in lieu of the DEMP) the Detailed Waste and Recycling Management Plan (DWMP) is to include as a minimum the following:

- the project's waste minimisation objectives
- the quantities (by weight and volume) of each waste stream generated on site and the proposed reuse, recycling or disposal method
- the proposed waste collection and disposal contractors, including the recycling contractors
- waste management measures to reduce waste disposed
- the waste and recycling management responsibilities of the head Contractor and subcontractor/supplier
- the subcontractor and suppliers' Waste and Recycling Plans (if deemed necessary), and
- the proposed waste and recycling performance monitoring and reporting procedures.

XX–02: Environmental rating initiatives

Where an environmental rating (e.g. NABERS or Green Star) has been determined during the project design stage, the Contractor is to ensure the following:

- the rating is achieved in relation to works under the contract
- initiatives are not altered without the approval of the Principal or Superintendent
- all documentation required to support a formal submission for the environmental rating (as applicable) is collated and made available, and
- where instructed, the Contractor is to obtain the required rating certification from the relevant certification or accreditation authority.

Attachment 1: [XX] Schedule of Environmental Management

[XX] Schedule of Environmental Management

[for inclusion in tender documents]

[Tender no. ######]

[Tender name]

Company information	
Company name and contact details:	

1 Relevant experience:

List projects the Tenderer has undertaken that demonstrate relevant experience	Value ($)
a.	
b.	
c.	
d.	

2 References: provide written references from at least two recent clients demonstrating company environmental commitment and experience.

	Company 1	Company 2	Company 3
Client:			
Contact name:			
Phone number:			

Environmental policy and environmental management:
Attach supporting information as necessary.

3	Tenderer's Environmental Policy	
4	Tenderer's Environmental Management System (EMS) or similar system (see 'Tender requirements – Clause 4')	
	Describe how environmental risks are managed within the Tenderer's business activities (not limited to this project).	

	Describe environmental awareness and skills training provided to Tenderer's staff and contractors.	
5	Describe the Tenderer's understanding of sustainability in relation to the Australian construction industry including the NABERS and Green Star rating systems	
6	Describe the Tenderer's performance in relation to environmental regulations over the last five years including any judgements against the tenderer under any State or Federal environmental legislation.	
7	Describe the Tenderer's environmental monitoring and corporate reporting (e.g. sustainability reporting processes).	
8	Describe the Tenderer's environmental performance and experience on similar projects with respect to the following key outcome areas: [list them here].	
9a	Provide an Outline Environmental Management Plan as per minimum scope detailed in Tender requirements Clause 9a.	

and/or

9b	Provide an Outline Waste and Recycling Management Plan as per minimum scope detailed in Tender requirements Clause 9b.	
10	Describe how the Tenderer will comply with an Environmental Impact Assessment (EIA) or Social Impact Assessment (SIA) where required	

[Note to contract documenter: Include both (a) or (b) above, or choose one of them, subject to the scope of work and extent of potential environmental risks. Confer with the project manager for direction as necessary.]

(Adapted from Australian Government Department of the Environment, Water, Heritage and the Arts.)

Worksheet 4.2B

Environmental evaluation of project tenders

This is an example only – adapt this Worksheet to suit your organisation's requirements.

Section A: Company information

Company name:			
Type of business:			
Street address:			
Mailing address:			
Principal contact:		Phone:	Email:

Description of work under the Contract

Briefly describe:	
Applicable property:	

Section B: Relevant experience

Rate jobs listed by tenderer against relevant experience	Job listed by Tenderer		Experience	
			Adequate	Inadequate
	1			
	2			
	3			
	4			

Has Tenderer worked on other [client] projects or properties in the last 3 years? If so, are there any concerns that need to be addressed?	

Environmental references provided by Tenderer

	Company 1	Company 2	Company 3
Type of service provided:			
Client:			
Contact name:			
Phone number:			

Reference followed up (Y/N)			

Section C: Evaluation criteria

	Criteria	Ex [1]	Ad [2]	Inad [3]	Comments
	C1 Company policy and management				
1	**Policy** – Company environmental or sustainability policy that clearly identifies the vision, objectives and commitment of the company (keep copy on file).				
2	**Understanding** – Degree to which the Tenderer understands sustainability in relation to its industry sector and its activities.				
3	**Environmental Management System** – EMS or similar system (e.g. Quality Assurance) that describes how environmental risks to the company are effectively identified, managed or mitigated.				
4	**Responsibilities** – Are responsibilities and accountability clearly defined within the company's management system to cover principal areas of environmental risk?				
5	**Regulatory compliance** – Any environmental or workplace penalties or infringements in the last 5 years?				
6	**Training** – Adequacy of environmental awareness and skills training provided to company staff.				
7	**Monitoring & reporting** – Adequacy of the company's environmental monitoring and corporate reporting processes (e.g. sustainability or corporate responsibility)				
8	**Environmental experience** – Capacity to demonstrate previous successful experience in environmental management and project-specific environmental outcomes.				

[1] Able to demonstrate **excellent** performance – above average capability or experience
[2] Able to demonstrate an **adequate** performance – acceptable minimum
[3] **Inadequate** performance – unable to demonstrate an acceptable minimum performance

Section C: Evaluation criteria

	Criteria	Ex [1]	Ad [2]	Inad [3]	Comments
	C2 Project environmental management plan				
9a	**Environmental management** – Adequacy of the outline EMP[4] submitted with the tender response. [if an EMP is required in the contract]				
	Environmental responsibility – Does outline EMP allocate responsibility and accountability to project staff, including using staff with appropriate skills and experience for the project needs?				
	Environmental training – Has the Tenderer completed induction training for this property?				
	Management of subcontractors – How well does the Tenderer commit to managing subcontractors and major suppliers to achieve the project's environmental objectives?				
	Energy management – Measures the Tenderer will take to minimise energy use when on the property.				
	Water management – Measures the Tenderer will take to minimise water use when on the property.				
	Waste and recycling management – Adequacy of the typical WMP[5] provided with the tender response.				
	Noise management – Measures the Tenderer will take to minimise noise disruption to building occupants.				
	Air and indoor environment quality management – Measures the Tenderer will take to avoid toxic or nuisance emissions (e.g. dust) and maintain indoor air quality standards.				
	Monitoring – Adequacy of the proposed project environmental monitoring procedures.				

[4] EMP – Environmental Management Plan
[5] WMP – Waste and Recycling Management Plan

Section C: Evaluation criteria

	Criteria	Ex [1]	Ad [2]	Inad [3]	Comments
	Reporting – Adequacy of project environmental performance reporting procedures or commitment.				
	Other environmental capabilities or experiences offered by the Tenderer.				
	C3 Occupational health & safety				
	Record – From the information provided by the Tenderer, rate the company's OH&S record. Excellent = no lost time injury (LTI) or no medical treatment cases (MTC) in last 12 months. Adequate ≤ 2 LTI and 2 MTC in last 12 months Inadequate ≥ 2 LTI and 2 MTC in last 12 months				
	Training – Adequacy of staff OH&S training				
	C4 Social (include relevant issues)				
	Other: e.g. Employment initiatives Community initiatives				

Assessor's name:		Ph:
Comment:	(Brief comment on whether the Tenderer has demonstrated sufficient experience, capability and commitment to meet project expectations and requirements.)	
Contract commitments	(Note detail if award of a contract or pre-registration should be conditional on the Tenderer committing to an action, deliverable or outcome or providing further evidence of capability in a particular area before project start.)	
Recommendation:	(Yes/No – to whether the Tenderer should be considered for the Contract, or pre-qualification registration, based on sustainability criteria).	
Assessor's signature:		Date:

Sustainable fitouts

4.3

Context

Fitouts provide an excellent opportunity to actively work with your tenants for mutual benefit. Both tenants and property owners are increasingly aware of the long-term benefits they can gain by incorporating environmental and social criteria into base building and workspace fitouts, particularly in regard to operational savings. Increased workforce productivity is also emerging as a strong incentive. Given that a 1 or 2% increase in workforce productivity can reap substantial earnings, tenants are keen to use a base building refurbishment (retrofit) or new tenancy fitout to maximise their potential to create a practical, healthy and stimulating work environment.

Tenants who pursue sustainable fitouts are also reporting easier staff recruitment and retention. A sustainable fitout is a clear demonstration of an organisation's commitment to good environmental practice.

Many organisations, particularly major international corporations, are required to report on their sustainability performance. Typically this includes energy use and waste. They are also increasingly concerned to ensure the workplace they provide for their staff is a healthy indoor environment and the correct systems and measures are in place to maintain and improve it through the term of their tenancy. Many companies want to carry out their fitouts to good environmental standards. Achieving good ratings such as Green Star and NABERS demonstrates their performance in sustainability to their internal and external stakeholders.

Helping tenants to take on this challenge early in the fitout planning stage allows the greatest potential for achieving productive and efficient work environments with lower environmental impact at minimal additional cost.

What's in this section

Successful cooperation

'As a building owner and portfolio manager, Investa believes the best outcomes for the organisation and for its tenants are achieved through a cooperative approach. We believe there is a direct connection between the success of our tenants and our long-term investment returns.'

Campbell Hanan, Group Executive, Investa Property Group

Steps: Sustainable fitouts for tenants

The following steps set out how you can help tenants improve the sustainability of their fitout – either office or retail.

1 Engage with your tenants: capacity building

Develop a strategy to raise your tenants' awareness of the benefits of a sustainable fitout. The objective of your strategy is to create opportunities to work with your tenants. Use these opportunities to help them make informed decisions about the environmental and social issues associated with their office or shop fitout. Your engagement strategy might include a range of measures, such as:

- raising awareness by showcasing an example of a sustainable fitout in your building or retail centre which other tenants could visit and learn from
- including sustainable fitout requirements in your building rules or as part of the fitout design approval processes
- negotiating sustainable fitout requirements as part of a 'green' lease
- including sustainability advice as part of the value-added services you provide to tenants.

Make sure your tenants are aware of the sustainability measures you are implementing at a base building level and the important role these play in improving the performance of the whole property. For more information about working with tenants to improve environmental performance see Section 3.4: 'Tenant engagement and green leases'.

2 Identify sustainable fitout initiatives

The following resources could be useful for helping tenants to identify opportunities to improve their environmental performance.

Office accommodation

The *Green Lease Guide* (www.livingthing.net.au/RC_Guide.htm#i16) is particularly helpful for tenants who want to understand what makes up a sustainable office fitout. It also contains helpful tips on improving the environmental performance of ongoing operations, e.g. by selecting efficient office equipment and purchasing recycled content stationery and consumables.

The *Green Lease Guide* provides guidance on:

- environmental rating schemes
- efficient lighting and lighting controls
- floor finishes and retaining existing coverings

Guide for tenants: benefits of a sustainable fitout

The *Green Lease Guide* contains the following advice for tenants:

'The fitout stage provides your organisation with a cost effective opportunity to enhance its reputation, boost employee satisfaction and lock in significant ongoing cost savings.

At this stage you have the opportunity to make decisions that can, at little or no additional upfront cost:

- improve employee productivity and organisational learning
- help you to attract and retain staff
- enhance your corporate image and provide competitive advantage
- reduce your energy bills and other expenses
- minimise your occupational health and safety liabilities.

These benefits all have an impact on an organisation's commercial success and exposure to risks.'

Green Lease Guide, 2007
www.livingthing.net.au/RC_Guide.htm#i16
Investa Property Group in partnership with the Department of Environment and Climate Change NSW, City of Sydney, City of Melbourne and the Institute for Sustainable Futures, University of Technology Sydney.

- partition walls, including modular walls and using existing walls and ceilings
- joinery (doors, built-in furniture, kitchenettes)
- workstations and general office furniture
- energy and water efficient kitchen fittings and appliances
- low emission paints, sealants and adhesives
- water efficient bathrooms and toilets
- efficient supplementary air conditioning
- the benefits of submeters and 'smart' meters
- using indoor plants to improve indoor air quality
- demolition and construction waste management and recycling.

Environmental ratings for office fitouts

Tenants can use environmental rating tools to identify the performance of their fitout e.g. achieving a 5 star NABERS Energy rating for their tenancy or to identify key attributes to include in their fitout design, e.g. the Green Building Council of Australia's Green Star Office Interiors rating. By encouraging tenants to rate their tenancy using an industry-accepted environmental rating tool, you can help them demonstrate leadership and their commitment to achieving sustainable accommodation. You can also encourage tenants to join CitySwitch Green Office – see www.cityswitch.net.au

For further details on the environmental ratings tools see:

- NABERS: National Australian Built Environment Rating System: www.nabers.com.au
- Green Star Office Interiors: www.gbca.org.au

Calculators for retail centres and shop fitouts

The GPT Group has developed a suite of Retail Centre and Retail Tenant Ecological Footprint calculators in partnership with Global Footprint Network and EPA Victoria to help retail centre managers and tenants identify and understand the environmental impacts of design and operational practices. The ecological footprint provides an indication of the amount of productive land required to create, operate and absorb the waste of a particular activity.

Tenants can use these online calculators to quantify the impacts of their store fitout, including their choices of:

- interiors (shop front, walls, wall and floor finishes, ceilings)
- fittings (counters and shelving)
- lighting and power
- transport options.

Using the Retail Ecological Footprint calculator

'The GPT Group uses the Retail Ecological Footprint Calculator to help its tenants understand the environmental impacts of their store fitouts. The GPT Group encourages tenants to reduce their impact by responding with changes in design and operational practices.

All new GPT Group retail tenants are required to use the Retail Ecological Footprint calculator during their design approval process. So far over 200 tenants have used the tool in GPT centres including Rouse Hill Town Centre and Melbourne Central.

The benefits have been demonstrated in both ecological footprints and operating results, with an average footprint reduction of 29% to date. The GPT Group highlighted education and the involvement of all parties – retail design managers and leasing teams – as critical success factors. The Group has also helped tenants ensure their commitments have been implemented by their contractors, delivering further value back to the tenants.'

www.epa.vic.gov.au/ecologicalfootprint/caseStudies/gpt.asp and www.gpttreadslightly.com.au and www.gpt.com.au/content.aspx?urlkey=cr_overview

To download the calculators visit the Ecological Footprint section of the Victorian EPA website: www.epa.vic.gov.au/ecologicalfootprint/calculators/default.asp

The NABERS Energy and Water ratings for retail centres will be available in 2009.

3 Incorporate sustainability into the design phase

Once your tenants are committed to improving the environmental performance of their fitouts, help them to integrate sustainability into their design processes.

Worksheet 4.3A provides a detailed checklist of actions supporting sustainability criteria throughout the whole fitout process, from design and project management through to handover to occupants.

This checklist is not intended to be all-inclusive nor a detailed technical guide. It aims to provide an overview of common design, procurement and construction opportunities as well as emerging issues for good sustainable office design. It can also be adapted for a retail environment. It includes ideas on how to integrate environmental performance into tenants' project delivery systems to focus attention on good environmental design, material procurement and construction delivery.

This information is not an alternative for a sustainable design rating of an office fitout. Assessment tools in NABERS and Green Building Council of Australia's Green Star provide further design and construction advice to design teams and project managers. For information about environmental rating schemes see Section 1.2 of this Guide.

4 Check and report the outcomes

Check that commitments identified during the briefing and design process have been implemented and that systems are in place to ensure that optimum ongoing performance will be maintained. This is particularly important if the fitout is to be marketed as 'green'.

Celebrate the achievement and use the fitout as a showcase for other tenants in the building or retail centre so that knowledge gained from the project can be shared.

Sustainable Design Plans

Incorporating sustainability criteria into a fitout design phase can be managed using a Sustainable Design Plan. The following criteria could be incorporated into the project brief or Sustainable Design Plan for an office or retail fitout:

- Avoid unnecessary waste creation in strip-out and construction activities.
- Increase use of second-hand, recycled and recyclable materials, reducing the quantity of waste sent to disposal.
- Avoid construction techniques that reduce potential for reuse or recyclability of materials (e.g. use screws instead of adhesives).
- Reduce longer-term environmental impacts by considering the life cycle impacts when selecting fitout materials and finishes.
- Avoid materials and practices that may harm the environment or building occupants.
- Reduce utility costs through efficient use of energy and potable water.
- Improve indoor air and environment quality.
- Improve workplace morale and productivity.
- Reduce the cost of doing business.

See section 4.1 and worksheet 4.1A for detailed information about Sustainable Design Plans

Waste and churn

'Make good' clauses in leases often lead to significant wastage of materials such as carpet, light fittings and furnishings. Work with your tenants to identify opportunities to leave fixtures and furnishings in good condition for reuse by future tenants or to determine which elements of the previous tenancy fitout can be reused. This approach can result in significant cost savings for you and your tenant.

Green Lease Guide 2007
www.livingthing.net.au/RC_Guide.htm#i16

Further information

In addition to using knowledgeable environmental designers, other sources of information include:

- NABERS, www.nabers.com.au
- Green Star Office Interiors Tool, Green Building Council of Australia, www.gbca.org.au
- Property Council of Australia, www.propertyoz.com.au
- *Green Lease Guide*, www.livingthing.net.au/RC_Guide.htm#i16
- *The Tenant Energy Management Handbook*, www.nabers.com.au
- Ecological Footprint Calculator, EPA Victoria, www.epa.vic.gov.au/ecologicalfootprint/calculators/default.asp.
- ecospecifier (lists over 3,000 environmentally preferable materials, products, resources and technologies; also a portal for eco-materials research), www.ecospecifier.org
- Healthy Building Network, www.healthybuilding.net
- Forest Stewardship Council, www.fsc.org
- The Wilderness Society sustainable purchasing guide to choosing environmentally friendly building materials and paper, www.wilderness.org.au/articles/sustainable-purchasing
- *The Aurora Guide* (compiled by RMIT Centre for Design), environmentally preferred building materials, www.cfd.rmit.edu.au/content/download/336/3209/ file/Aurora_GuideL.pdfdownload/336/3209/file/Aurora_GuideL.pdf
- Good Environmental Choice, Australian Environmental Labelling Association (AELA), www.aela.org.au
- *ESD Design Guide for Offices and Public Buildings*, Australian Government Department of the Environment, Water, Heritage and the Arts, www.environment.gov.au/settlements/publications/government/esd-design/pubs/esd-design-guide-introduction.pdf
- *ESD Design Guide for Australian Government Offices* (Edition 2) 2006, www.environment.gov.au/settlements/publications/government/esd-design/index.html
- Sustainable Choice, a NSW local government sustainable procurement program, www.lgsa-plus.net.au/www/html/956-sustainable-choice.asp
- CitySwitch Green Office, www.cityswitch.net.au

Worksheet

Review and use this Word document:

4.3A Checklist for sustainable fitouts

Worksheet 4.3A

Checklist for sustainable fitouts

	Applicable (yes/no)
Planning phase	
Objective: To identify and integrate into the project, through a systematic process, a sustainability vision for the building fitout consistent with the core values, policies and commitment of the tenant organisation or building owner.	
Agree on a sustainability vision for the project	
Identify the sustainability vision and desired outcomes for the project. Focus on practical and achievable outcomes that will allow the fitout to demonstrate the organisation's commitment to sustainability. Include this information in the project manager's brief and the tender documents for the design team.	
Consider benchmarking against existing industry rating tools such as Green Star Office Interiors or NABERS Energy.	
Use a competitive tendering process to engage a design team (and project manager if necessary) with the appropriate skills and experience for achieving the sustainability vision.	
Integrate vision into project design brief and budget	
Incorporate the process of exploring, discussing and confirming agreed sustainable design initiatives into the project design brief. (See the design phase recommendations regarding a Sustainable Design Plan, below.)	
Make sure the brief addresses space planning and density requirements including workspace allocations and flexible working arrangements. Flexible working arrangements should consider capacity to 'hot desk', moveable walls to support multiple space uses, and maximisation of open plan environments. Consider how IT infrastructure, computer specifications, cabling access to workstations and the use of laptops instead of desktops could increase flexibility, promote productivity and reduce cable wastage.	
Set a Green Star Office Interiors rating as part of the project vision	
Determine a preliminary budget for realising the sustainability vision and make sure this is included in the project budget. Capital allowances should recognise the whole-of-life financial savings (e.g. reductions in energy costs) likely to be achieved through environmentally responsible design.	
Identify how outcomes will be measured	
Develop the key performance indicators for measuring environmental and workplace achievements. Where possible work out a whole-of-office baseline so comparisons can be made between the working environment pre and post fitout. Refer to Green Star Office Interiors for potential indicators.	

	Applicable (yes/no)
Depending on the lease structure, relevant indicators could include consumption of energy (electricity and gas) and water per square metre (or person), costs of utilities per square metre, indoor environment quality measures and quantity of waste created and recycled in the working environment. Other indicators could include sick leave attributed to working conditions, staff morale, annual productivity, staff working hours and staff retention rates. Some initiatives may be achieved for no or small additional cost.	
Explore opportunities for the lease	
Discuss opportunities to achieve 'win-win' sustainability outcomes with the managing agent e.g. opportunities to incorporate energy efficient initiatives for both the base building and the tenancy in the lease, or core building upgrades that give the tenant greater control of indoor comfort and lighting without imposing unacceptable costs on core building services. Consider a 'green lease' to formalise shared benefits and allow the tenant to be represented on the building management committee. It may also assist in the Green Star rating process.	

Design phase

Objective: To put together a design team and facilitate a design process that rewards innovation and systematically addresses and evaluates design options for achieving the sustainability vision within the available resources.	
Selecting and briefing the design team	
Evaluate tender responses to the design brief and select a team based in part on their understanding of your vision and their capability and experience with sustainable design. Look for innovation in past projects, familiarity with green building design tools and team cohesion. Consider a specialist environmental design facilitator to coordinate the sustainable design process.	
Integrate sustainable design into the design process	
Develop a Sustainable Design Plan (SDP) as a component of the project brief. The design team should develop this further and use it to facilitate the design process. See Section 4.1 of this Guide for further detail.	
Where appropriate, consider using criteria in Green Star Office Interiors and NABERS to focus aspects of the design effort. Make sure the design team is familiar with Green Star and NABERS and recognises its role in identifying and achieving good environmental design as modelled in Green Star and NABERS.	
Allocate responsibility for using the SDP as a facilitation tool to a key member of the design team. This could be the project manager, lead architect or specialist environmental facilitator. Alternatively, consider using an accredited Green Star professional (essential if a rating is to be undertaken) to support the design process.	

	Applicable (yes/no)
After preparing the SDP, this person's initial task could be helping to brief the design team before design process begins to make sure the team members understand what is expected of them.	
Make sure the design phase timeline adequately recognises the time that will be required to explore environmental design options.	
Encourage the team to seek innovative solutions to desired design outcomes. Make sure the whole life cost of design alternatives are properly considered so the client can make informed decisions when looking at trade-offs between capital costs and longer-term operational savings.	
Investigate technologies, products and materials that can help improve the environmental performance of the fitout.	
Where feasible, use computer analysis, life cycle assessment and life cost modelling to test design options.	
Sustainable design reviews and design considerations	
Undertake regular and scheduled sustainable design reviews. Use the SDP as a reporting tool to make sure these design reviews are given appropriate attention from the outset. They should be part of the scheduled design team meetings wherever possible to involve all of the design team members. See Section 4.1: 'Sustainable building through design management'.	
Involve key decision makers in the design reviews. Make sure they understand the design intent well enough to be able to explain it to their senior management and staff.	
Adopt passive design solutions wherever possible, such as maximising natural light and ventilation, providing all occupants with access to views and installing stairs for internal circulation where practical. Optimise use of natural light through features such as internal light shelves, reflective wall finishes or internal operable blinds.	
Investigate capacity for optimising use of energy efficient lighting and lighting controls that allow flexibility for the occupants. If feasible, consider using multiple lighting zones to accommodate efficient after-hours lighting. Consider controls that can reduce the energy consumption of fluorescent lights after start-up.	
Where tenant HVAC is proposed, make sure high efficiency equipment is used with controls that reflect the required usage periods.	
Encourage the designers to explore all feasible options for using environmentally friendly fitout materials and finishes with proven low indoor air quality risks. See Section 3.8: 'Managing indoor environment quality'.	
Where desirable, optimise flexibility in the workspace. For example, consider whether moveable wall systems could be used to adapt spaces for a variety of uses.	

	Applicable (yes/no)
Check the design team obtains and critically reviews any certification or documentation provided by material or product manufacturers that claims stated levels of environmental performance e.g. timbers from sustainable forestry sources. Give preference to products or materials with third party certification e.g. the Australian Environmental Labelling Association's Good Environmental Choice label or a listing with ecospecifier. Seek explanations of any environmental claims made by suppliers, including performance documentation.	
Make sure material durability is commensurate with the life expectancy of the fitout. Choose durable, long-lasting materials over short-lived alternatives.	
Optimise use of materials that have a high proportion of recycled content or are known to be readily reusable or recyclable at the end of their useful life.	
Consider ease of disassembly for fitout partitions and workstations in situations where the lease requires the tenant to strip out and return the space to core facilities. Minimise alterations to the base building. Elements damaged or changed may have to be made good at lease termination. These considerations should be included whether it's the tenant's responsibility to make good or not.	
Check that construction methods do not reduce the reusability or recyclability of materials (e.g. use screws and bolts instead of adhesives).	
Check that equipment and appliances that use water are highly efficient in their water usage. Encourage the building owner to install waterless urinals, rainwater collection devices or greywater reuse technologies where practical.	
Assess and list all materials or building components that should be retained, partially modified, or removed during demolition for sale, recycling or landfill. Targets for material recycling and diversion from landfill should be estimated and included in tender documentation. Optimise retention of materials where practical and desirable—this could include workstations, walling, doors, floor coverings, ceiling tiles and light fixtures.	

Tender phase

Objective: To manage the process for evaluating and selecting products, materials and construction services (and incorporate this in the tender and contract documentation) so the following is achieved: • the construction market is fully informed of the minimum and required environmental quality of products, materials and construction services • opportunities are maximised for market competition to provide environmentally superior products, materials and services • certification is provided for the environmental performance of products and materials • suppliers and contractors are committed to a high level of environmental performance.	

	Applicable (yes/no)
Check that the tender documentation clearly states the desired environmental performance levels of products, materials and fitout based on industry good or best practice. Where possible specify outcomes and the audit trail that will be required, rather than proprietary products. See Section 4.2 'Sustainable projects through tendering' for more detail.	
Make sure the contract documentation, including plans and specifications, is written so as to achieve the project's sustainability objectives. The design team leader or project manager should sign off tender documentation in compliance with project brief requirements.	
Consider tendering arrangements such as alliances or partnerships with subcontractors and suppliers or leasing contracts in which fitout elements such as carpets, workstations and partitioning are leased. A leasing contract should identify environmental standards to be met, including durability, recycled content, recyclability, low emissions, replacement and maintenance requirements.	
Require tenderers to provide information on their past relevant environmental experience, regulatory environmental record, and capacity to commit to project-related environmental actions. See Section 4.2 of this Guide for more detail.	
Provide opportunities for innovation such as encouraging tenderers to nominate alternatives e.g. environmentally friendly materials or construction processes.	
Where reasonable, and particularly for large or complex fitouts, include a requirement for an outline Environmental Management Plan (EMP) with a strong focus on waste minimisation, recycling, pollution avoidance and noise control. This may assist in Green Star accreditation.	
Where the contract works involve a development approval, consent conditions are likely to require that a construction Waste and Recycling Management Plan (WMP) is prepared and implemented by the head contractor, including management of subcontractors' demolition and construction waste.	
Check that contract documentation commits the head contractor to being responsible for the environmental performance of subcontractors and suppliers.	
Check that contract documentation commits the head contractor to regularly report on progress of either the EMP or WMP or other environmental management requirement.	
Check that contract documentation provides for commissioning and tuning to ensure that the performances targeted in the design and documentation are achieved in practice.	
Check that contract documentation commits the head contractor to provide third party certification of any significant environmental claims made for products or materials supplied to the project e.g. sustainable timber sources, chlorine-free material, energy efficient products or materials.	

	Applicable (yes/no)
Demolition and construction phase	
Objectives: To ensure contractual requirements are in place to control or mitigate environmental impacts to air quality, waste, indoor amenity and stormwater and to ensure the sustainability objectives of the project are effectively delivered.	
Note: There are opportunities within the construction phase to achieve a high level of environmental performance but adequate consideration has to be given and systems set in place during the previous project delivery phases.	
Review any contract variations (particularly alternate products or materials) in accordance with the sustainability objectives for the project as set out in the design brief or Sustainable Design Plan.	
Check that the head contractor produces and adequately implements a Demolition Waste Management Plan (DWMP) detailing how waste will be dealt with, how much will be recycled, reused and sent to landfill, and measures to record actual waste for project performance reporting.	
Check that the contract requires demolition and recycling contractors to obtain and keep detailed weighbridge receipts and records to substantiate waste performance for project records.	
Environmental management	
Make sure the construction phase project manager is capable of and committed to managing environmental outcomes in compliance with the project brief and as set out in the contract and agreed construction Environmental Management Plan or construction Waste and Recycling Management Plan (as applicable).	
Before works begin, ensure the head contractor, the project manager and others (as necessary) meet at the start of the project to confirm the approach to be taken to environmental management including work practices, compounds, material ordering and waste management. Make sure that all people involved understand what is expected of them, their responsibilities and outcomes that need to be reported.	
Monitor progress against the environmental management plans and, in particular, deal with noise abatement and dust suppression. These are often the root cause of complaints from other occupants or neighbours.	
Check that the head contractor and subcontractors are complying with the waste separation and recycling opportunities set out in the construction Waste and Recycling Management Plan – in particular, the collection for off-site reprocessing of demolition materials such as plasterboard, timber framing, metals and carpets. The contract should encourage contractors to minimise offcuts wherever practical.	
If included in the contract, consider the collection for resale of toilet fittings and kitchen or hub furniture and fittings if not appropriate for reuse in the new fitout.	

	Applicable (yes/no)
Check that the building's HVAC system adequately isolates the construction area to avoid dust dispersion throughout the building, and that the AC vents and filters are cleaned after construction.	
If not detailed in development consent conditions, consider undertaking very noisy activity or activity that creates noxious emissions (e.g. some carpet glues, timber floor finishes) after hours or during weekends and work with the building management to ensure where possible that noxious emissions are fully vented.	
Optimise off-site fabrication of fitout components so that waste generation and manufacturing impacts are not occurring on site and are minimised.	
Where the head contractor has established a works compound and material handling area on the property (e.g. in a carpark) check that adequate provision is made for dust, stormwater run-off and safe storage of potentially hazardous materials. The latter should be kept to an absolute minimum.	
Commissioning	
Comprehensive pre-commissioning, commissioning and quality monitoring should be required in the contract and performed by the appropriate contractors, suppliers and trades on site. NOTE: The Property Council of Australia (PCA) recommends the use of independent commissioning before occupation and upon completion of the HVAC and services package or works or the full contract. The PCA also advises tenants to test systems to check they are working as designed and to obtain a commissioning report before formal hand-over. Green Star Office Design and Interiors Tool, Management category, gives credit for tuning and commissioning and provides useful guidance.	

Occupation phase

Objectives: • Provide a safe, stimulating and productive environment for staff and visitors. • Ensure appropriate monitoring of indoor environment quality against recognised healthy building standards. • Optimise opportunities for occupants to be able to control the thermal comfort and level of lighting within their work areas. • Ensure occupants understand the environmental features of their fitout and are aware of their individual responsibilities, particularly regarding energy use and waste recycling. • Where appropriate, implement a plan to manage and monitor energy consumption and waste recycling in tandem with the building manager's facility management plans to make sure core building environmental management supports the tenancy objectives, and vice versa.	

	Applicable (yes/no)
Raise awareness and define responsibilities	
Upon occupation, staff should be inducted into the operational features of the building and fitout and made aware of the environmental benefits of facilities such as lighting and comfort controls, waste and recycling systems, etc. Check that initiatives are in place for inductions and ongoing reinforcement so that staff awareness of their responsibility to 'do the right thing' is maintained.	
Make sure the building manager and any building contractors (e.g. cleaners) understand the sustainability features of the fitout. Copies of contract documentation, equipment manuals and work as executed documentation are normally required by the building manager, but they should also be invited to attend the staff induction upon occupation to gain an understanding of why and how certain levels of performance and responsibility are required.	
Environmental monitoring and management (EMM)	
Develop an EMM Plan (or similar) with a focus on ensuring energy use and waste management are within reasonable parameters. This plan could be included in the Office Operations and Maintenance Manual (or similar) and could include data on monthly tenant energy usage provided either by the building manager or via the energy retailer, where metering is provided. Fluctuations in usage above a pre-determined target should be investigated and improvements implemented. Staff may need to be periodically reminded of their role in ensuring the sustainable design features of the tenancy are properly used.	
Make sure appropriate attention is devoted to tenancy waste minimisation including appropriate location and signage for waste and recycling bins, and provision of multi-stream bin stations (paper, recyclables and residual waste). Collect monthly information from the building manager on waste and recycling collected from the tenancy, or where this is not readily identifiable, undertake periodic waste audits to quantify waste generation, recycling and levels of recycling stream contamination. Implement measures to ensure staff consider waste minimisation as a 'business as usual' activity. Consider specifying office materials and consumables that have low environmental impacts including minimal packaging.	
Minimise the use of toxic cleaners and pest treatments. Use natural cleaning products where possible. Use non-toxic pest treatment, rather than introducing poisons into the workplace, and integrated pest management if further treatment is required.	
Consider purchasing a percentage of GreenPower or similar from your energy retailer. This has the potential to significantly reduce your greenhouse gas emissions.	
Retain records of performance, particularly energy consumption where metering is provided. This will facilitate an energy efficiency rating of the tenancy by using NABERS Energy.	

	Applicable (yes/no)
Post-occupancy evaluation	
Within 12 months of occupation conduct a post-occupancy evaluation of the HVAC and lighting systems and physical character of the fitout including feedback from staff. Ensure the scope includes elements of the fitout contract as well as the systems and equipment provided by the tenant (e.g. computers, printers etc.) where new equipment is included in the fitout. The evaluation should also determine whether the relevant project sustainability objectives have been achieved and whether there are any indoor air quality issues that need to be addressed by the contractor or building manager.	
Consider undertaking a formal NABERS Energy rating. Check with authorities to confirm the scope of information required and then integrate this requirement into project delivery as early as possible.	
Maintenance	
Tenancy-specific maintenance plans may be desirable. They should be prepared in collaboration with the building manager as part of the tenancy commissioning process. Instigate systems so that tenancy features and tenancy-owned HVAC and lighting systems are properly maintained and integrated, where appropriate, with maintenance activities related to the core building.	
Check that maintenance activities include checking waste and recycling facilities within the tenancy, reviewing cleaning practices and cleaning materials, repainting common areas, replacing light fittings, deep cleaning carpets, checking proper operation of sun control devices either within or exterior to the tenancy, cleaning and repairing mechanical systems installed by tenants, etc.	
Where practical, integrate tenancy maintenance with core building maintenance, e.g. consolidate contracts such as painting and cleaning.	

Sustainable base building refurbishment (retrofitting) 4.4

Context

Refurbishments (retrofits) and fitouts are fundamentally different. Refurbishments are carried out to the base building by the landlord, usually with a long-term focus on the improvement of the building to meet new or changing performance standards and aesthetics. Landlords will spend their money at their own discretion but are increasingly responding to tenant demand for good environmental performance. On the other hand, fitouts are internal building works and alterations to meet the needs of the tenant for the term of their occupation. They are usually paid for by the tenant or funded by the landlord for the tenant.

Refurbishing and retrofitting existing buildings are inter-changeable terms. This type of upgrading is the major area where the industry needs to focus in the next few years, so that existing buildings can compete with green buildings and incorporate energy reduction initiatives. The scene is set for an enormous amount of activity in this area over the next few years as leases end and the competition between new green and existing buildings intensifies.

Existing buildings comprise about 98% of all building stock. Existing buildings have the big advantage of having embodied energy tied up in the building fabric that is being retained, so it does not have to be replaced. With energy, transport and material costs set to increase as the cost of carbon is factored into the economy, existing buildings with good property fundamentals that can be made to meet new environmental criteria will be increasingly cost-effective to upgrade.

This section provides guidance on assessing the potential performance of existing buildings and a framework for establishing a scope for their upgrading.

What's in this section

Steps: Sustainable base building refurbishment

Achieving sustainability in existing base buildings is a complex process. It involves a range of additional criteria such as working around existing occupied tenancies, introducing changes to services while keeping the older services in operation and the risk of discovering and dealing with unforseeable defects. The options available for upgrading may seem too various but, by a thorough and careful process, you can establish a strategy based on the industry measures.

Remember to include expert commissioning advice from the outset, and involve the facility manager throughout the process.

1 Know your building

The industry rating tools (such as NABERS and Green Star) vary in operation and philosophy. Detail in the tools will evolve but it is critical to understand how the underlying principles relate to your building, then you can focus on how your building performs against the various tools.

Use the Property Council of Australia's *A Guide to Office Building Quality* as a matrix, then measure your building's performance against the various criteria. You may need help from both building and building services professionals. Even though your building is 'existing', include measurements against the 'new' specifications. Prospective tenants may compare your building to a new building so you should know how and where you compete. The benefit of knowing the building's performance against the PCA Guide is that any upgrading can be done to that standard, avoiding the common problem of over-performance in some areas and under-performance in others relative to the PCA grading.

Measure current performance against NABERS Energy, Water, Waste and Indoor Environment tools.

Carry out an inspection of the building fabric, where possible. Prepare a schedule of the maintenance and repair work required.

Also check your building's attributes against the measures contained in the Green Building Council of Australia's Green Star tools. Follow developments in these rating systems to access any new tools and measures. Use the Green Star categories as headings for areas to review:

- management
- indoor environment quality
- energy

- transport
- water
- materials
- land use and ecology
- emissions.

Establish how your building performs against each category and subcategory. Be aware of what might be achievable in the innovation category.

2 Establish an upgrade strategy

Having established how your building performs against PCA, NABERS and Green Star, take advice on how tenant demand is changing and what tenants expect from buildings in Australia and around the world. Owners and advisers often fall into a trap of having only a superficial understanding of tenant demand and requirements. The scope of upgrade you choose must dovetail with tenant demand. Look at competing buildings to see the standards of performance and features they provide.

Use the information taken from the review in Step 1 to prepare a comprehensive list of works that could be carried out.

Prepare outline budgets for the proposed works. Also ensure you include the building works required in association with services upgrades, i.e. access, plinths, duct penetrations, making good, etc. Include costs for attending to any maintenance and repair works required. Allow a contingency for unforseeable defects.

Determine how the works can be carried out while the building is in operation.

Analyse the list, putting the various works into priority.

Consult with an expert in commissioning or tuning buildings and ensure this role is included from the outset. Seek the commissioning expert's opinions on the targets and ensure they are on the team and consulted regularly from establishing the scope right through until the systems are up and running and tenants are using the building.

You will be unlikely to carry out all of the works at one time as there will be constraints of funding, keeping the building operating for the tenants, lease expiries and profile, etc. Examine costs and value against the long-term benefits. Review the options against likely tenant requirements. You may need to employ value engineering to provide structure for your decision making.

3 Summary of the refurbishment process

1. Schedule the performance of all elements that affect NABERS Energy and Water ratings e.g. all services impacting energy and water consumption – mechanical services, hydraulic services, electrical services. Provide an initial assessment of the current star rating under NABERS Energy, Water, Waste and Indoor Environment rating systems. At this stage a formal rating may or may not be required.
2. Prepare a table for upgrading according to each of NABERS Energy, Water, Waste and Indoor Environment ratings.
3. Schedule the performance of all elements that may affect the building's existing performance against your requirements in the Green Star categories. Establish a list of potential improvements.
4. Schedule the performance and statistics of the building against the PCA's *A Guide to Office Building Quality* and work out the Grading of the building. Assess the potential for improvement.
5. Provide an assessment of the works required to upgrade the building to a particular Grade in accordance with the PCA's *A Guide to Office Building Quality*.
6. Prepare a comprehensive list of all possible upgrades and consider the strategy on how these may be achieved.
7. Prepare a schedule of the maintenance and repair work required.
8. Establish costs to achieve all possible works being considered. Include a contingency.
9. Establish a value engineering study of the various possible upgrades to arrive at a scope for refurbishment. Include market knowledge in your decision making. Work out a realistic time frame in accordance with lease expiries, marketing requirements, management cost reductions (i.e. energy reduction initiatives) and available funding.
10. Include commissioning expertise:
    - when setting the performance targets, including green ratings
    - when scoping and documenting the works
    - when checking the installation is proceeding correctly
    - at Practical Completion
    - at least during the period between Practical Completion and the achievement of ratings, or ongoing as part of building management.

Further information

In addition to using knowledgeable environmental designers, other sources of information include:

- Property Council of Australia, www.propertyoz.com.au
- Green Star Ratings Tools, Green Building Council of Australia, www.gbca.org.au
- NABERS, www.nabers.com.au
- *Existing Buildings Survival Strategies – A Toolbox for Re-energising Tired Assets,* Arup and Property Council of Australia, www.propertyoz.com.au/Bookshop/Book.aspx?p=52&book=71
- *Green Lease Guide*, www.livingthing.net.au/RC_Guide.htm#i16
- *The Tenant Energy Management Handbook*, www.nabers.com.au
- Ecological Footprint Calculator, EPA Victoria, www.epa.vic.gov.au/ecologicalfootprint/calculators/default.asp.
- ecospecifier (lists over 3,000 environmentally preferable materials, products, resources and technologies; also a portal for eco-materials research), www.ecospecifier.org
- Healthy Building Network, www.healthybuilding.net
- Forest Stewardship Council, www.fsc.org
- The Wilderness Society sustainable purchasing guide to choosing environmentally friendly building materials and paper, www.wilderness.org.au/articles/sustainable-purchasing
- *The Aurora Guide* (compiled by RMIT Centre for Design), environmentally preferred building materials, www.cfd.rmit.edu.au/content/download/336/3209/ file/Aurora_GuideL.pdfdownload/336/3209/file/Aurora_GuideL.pdf
- Good Environmental Choice, Australian Environmental Labelling Association (AELA), www.aela.org.au
- *ESD Design Guide for Offices and Public Buildings*, Australian Government Department of the Environment, Water, Heritage and the Arts, www.environment.gov.au/settlements/publications/government/esd-design/pubs/esd-design-guide-introduction.pdf
- *ESD Design Guide for Australian Government Offices* (Edition 2) 2006, www.environment.gov.au/settlements/publications/government/esd-design/index.html
- Sustainable Choice, a NSW local government sustainable procurement program, www.lgsa-plus.net.au/www/html/956-sustainable-choice.asp
- CitySwitch Greenhouse Initiative, www.cityswitch.net.au

Reporting sustainability outcomes

4.5

Context

Recording and evaluating end-of-project sustainability outcomes will enable your organisation to compare outcomes with intentions. This section contains advice about how to report on the performance of the project against the external and internal sustainability goals and measures set at project commencement, measures in the property industry and those of similar projects carried out by your organisation for similar building refurbishment or fitout projects.

Your project completion report needs to document the benefits achieved, the cost of achieving those benefits and the justification, or otherwise, of the original sustainability business case. Information gained from this reporting process should be integrated back into your organisation's knowledge retention system and made available in formats that suit knowledge transfer to future projects and project teams – also property management. This information can also be helpful when promoting sustainability achievements to stakeholders. Many aspects of sustainability, both environmental and social, will be ongoing, even after 'practical completion'. The cyclical nature of achieving and maintaining building performance and ratings is interconnected with the concept of the project delivery continuum, as discussed in Section 4.0 Overview. See also Section 3: 'Sustainability and Property Management'.

The key performance indicators used to track and measure sustainability performance should be consistent across projects and should dovetail with standard performance reporting criteria used by property organisations. These include the usual financial parameters of return on investment and savings in outgoings, but should also include other aspects of sustainability consistent with the goals and values of your organisation. Environmental performance improvement is not a one-off event but a series of incremental steps.

What's in this section

Steps: Reporting outcomes

1 Identify reporting indicators

Avoid reporting performances solely based on the easy availability of data. Reporting criteria should be meaningful and useful for project comparisons, fund and portfolio management and future investment decisions. Reporting might involve any number of the following indicators:

- achieving an industry 'green building' standard, such as a Green Building Council of Australia Green Star rating, or National Australian Built Environment Rating System (NABERS) rating
- achieving a quality standard, such as the Property Council of Australia's Premium or Grade A standard, as set out in its publication *A Guide to Office Building Quality*
- achieving or exceeding an agreed environmental benchmark, either set by industry (e.g. Sydney Water best practice water efficiency rate) or an organisation's own standard (e.g. above average energy, water or waste efficiency, expressed as X/m^2 NLA or GLA)
- comparing well against a fund or portfolio's average cost of operations for utilities, expressed as \$X/m^2 NLA or GLA
- winning recognition from external stakeholders, such as industry environmental awards or investment interest by ethical property funds
- comparing well against property performance measures such as speed of re-leasing refurbished space (especially when compared with competing space), tenant retention and tenant satisfaction (data from a tenant survey)
- demonstrating compliance with your organisation's sustainability policy or strategic sustainability goals, or
- other criteria specifically selected for the project e.g. successful piloting of waterless urinal technology or innovation in an aspect of project environmental management, e.g. use of an environmental tender specification tool such as Worksheet 4.3: 'Checklist for sustainable fitouts'.

Remember to add benefits that were not foreseen or expected when the project was scoped.

When selecting your sustainability performance indicators consider factors such as shareholders' requirements, risks to business activities, environmental compliance requirements and due diligence requirements.

Identify your reporting indicators as early in the project as possible. Systems need to be set up so that project participants can collect data and track performance.

2 Develop a reporting format

Worksheet 4.5A is an example of a project completion sustainability report. Adapt this to summarise the outcomes of your planning, design and construction processes and relate those outcomes to your organisation's corporate or project sustainability objectives.

Reporting frequency

Reporting of outcomes can be staged. They can be reported as estimates during the design phase, measurements during construction, and measurements taken after the occupation and use of the property or the part that has been upgraded or fitted out. Consult fund and portfolio managers on the reporting frequency required and KPIs to be used. There are no set intervals for reporting frequency. Timing should be driven by your organisation's need to know information at specific times in the project delivery process. Typically, the design team should be reporting outcomes using the completed tender-stage sustainable design plan (See Section 4.1). Construction programs typically include regular reporting of demolition and construction waste, with totals reported at the handover of the completed project.

3 Collect and verify data

Responsibilities for data collection and reporting should be shared across the design, construction and project management teams. Data requirements should be included in the design management process, such as in the Sustainable Design Plan (SDP), e.g. estimated greenhouse emissions, and in the tendering process to inform contractors of their data and information reporting obligations, e.g. construction waste recycling performance.

Verify all data provided by contractors and suppliers to confirm its accuracy and completeness.

4 Evaluate outcomes and report to stakeholders

Evaluate the project outcomes and compare them with the outcomes of similar projects undertaken by your organisation. Consider whether it would be useful to share some of this information within your organisation (not necessarily in the same format) so staff and other internal stakeholders are informed about the project having achieved its sustainability goals.

Who receives the benefits?

In your report include information about who receives the benefits. The business case for sustainability in the property sector identifies benefits for all stakeholders. High levels of environmental performance provide benefits for both property owners and for tenants, though they may not share the same benefits.

Reporting can document the real or perceived benefits for tenants. These could include:

- more responsive building management systems
- increased tenant control of indoor environment quality (IEQ) e.g. thermal comfort, lighting levels, fresh air and occupant satisfaction
- more cost efficient lighting and other reductions in outgoings
- creation of a highly desirable office environment attractive to staff and capable of enhancing reputation and workplace productivity.

5 Beyond practical completion – the property continuum

Whether a one-off project, staged works or part of a property portfolio, to be truly sustainable each project should be viewed as part of the property continuum. Key windows of opportunity for setting and achieving higher levels of performance based on sustainability standards will be ongoing, as sustainability awareness increases, legislation changes and higher accountability is demanded by both internal and external stakeholders. (See Section 4.0 Overview and Section 3.1: 'Incorporating sustainability into decision making'.) Achievements will be perceived by the market as successful or not when benchmarked against the rating tools. Rating tools will evolve as awareness increases, legislation changes and property reflecting higher environmental and social sustainability standards is sought. (See Section 3: 'Sustainability and Property Management'.)

Further information

- Green Building Council of Australia Green Star tools, www.gbca.org.au
- NABERS, www.nabers.com.au
- *A Guide to Office Building Quality*, Property Council of Australia, www.propertyoz.com.au

Worksheet

Review and use this Word document:

4.5A Project completion sustainability report.

Worksheet 4.5A

Project completion sustainability report

A project completion report would ideally be prepared when the fitout or refurbishment has been commissioned and operational benefits can be credibly identified. Post-commissioning reporting could take the form of six-monthly reports for the first year of major occupation. This is an example only – adapt this worksheet to suit your organisation's requirements.

Part A – Project summary	
Include a description of the project. As an example include:	
Property type *e.g. CBD commercial, built 1985, 15 floors, 1,200 m^2 floors, total area 21,000 m^2*	
Project type *e.g. refurbishment of 6 floors and base building*	
Scope *e.g. typical floors: upgraded air conditioning, lighting and lighting controls, upgraded toilets, upgraded lift lobby, installed window blinds, installed new carpet tiles, etc.*	
Base building *e.g. chillers replaced including new low-load chiller, chilled beams installed to centre zone, new BMS, lift cars and lift equipment upgraded, CO_2 monitoring, waste management, water reduction strategies*	
Management systems, *e.g. fitout guide upgraded to include environmental performance, environmental management plan, green lease clauses introduced*	
Budget	$ million
Timing *e.g. for scope setting and feasibility, design and documentation, construction lead time, construction time, time to obtain ratings*	
Project team, *e.g. Project manager, designer, services consultant, commissioning agent, leasing agent, managing agent, quantity surveyor, contractor*	
Other aspects to note *e.g. remainder of office floors occupied during works*	
Ratings targeted *e.g. NABERS Energy 4.5, NABERS Water 3.5, NABERS Waste 4, NABERS IE 4*	

Part B – Achievements against sustainability targets		
Describe outcomes against targets set in the Sustainable Design Plan or project brief. Provide documentation to verify:		
Sustainable design and construction targets	**Before upgrade**	**After upgrade**
NABERS Energy		
NABERS Water		
NABERS Waste		
NABERS Indoor Environment		
Green Star		
Property Council of Australia grading		
Pollution prevention		
Greenhouse gas[1] reduction		
Ecological conservation or enhancement outcomes		
Part C – Market response		
Rental levels		
Letting up period		
Valuation capitalisation rate		

Part D – Compliance with organisation policies[2]	
Anticipating and managing risks to the organisation	
Opportunities to improve staff awareness and skills	
Whole-of-life investment returns resulting from the project	
Improvement in project delivery systems, purchasing and management of service providers	
Part E – Other comments	
What was good value?	
What was bad value?	
What would you recommend next time, for *(each of the following)*:	
– set up?	
– management?	
– team make-up?	
– time for engagement of each of the various team members?	
– scope setting and selection?	
– costing?	
– value assessment?	

[1] 1 See the *AGO Factors and Methods Workbook* for the latest greenhouse emission factors (Australian Greenhouse Office, Department of the Environment and Water Resources, www.greenhouse.gov.au/workbook/index.html.
[2] For example, policies on sustainability, environment, OH&S, governance and risk management.

What would you **not** do next time?	
How would you change your approach next time?	
Comment on timing:	
What was difficult?	
What was easy?	
What documentation changes should be made?	
What documentation should be retained?	

What systems changes should be adopted?	
Project manager signature:	Date:
Portfolio manager signature:	Date:

our environment it's a living thing

Department of Environment and Climate Change NSW

5

Sustainability and the Supply Chain

Colonial First State

Global Asset Management

Department of **Environment & Climate Change** NSW

www.environment.nsw.gov.au

5.0

Section 5 overview

A common goal for all organisations is to convert environmental opportunities into business growth and continuity. This can be achieved by:

- working cooperatively with your supply chain to facilitate improvements that reduce cost of purchases or ease of manufacture
- improving the environmental quality of purchases
- supporting environmental marketing to customers
- building productive long-term relationships with valued suppliers and customers.

5.1 Greening the supply chain

Provides ideas and tools to help you identify opportunities then prepare a tailored strategy and implementation plan for engaging with your supply chain on sustainability issues.

Worksheet 5.1A Supplier relationships

Worksheet 5.1B Supply chain risks and opportunities

Worksheet 5.1C Supplier engagement strategies.

5.2 Sustainable services and supply through tendering

Provides advice about how to use the tendering process for building management services and supplies to support your organisation's sustainability goals, including environmental specifications and criteria you can adapt and use in tender documents and procurement contracts.

Worksheet 5.2A Specifications for building management services and supplies

Worksheet 5.2B Criteria for building management, waste and cleaning services

Worksheet 5.2C Evaluating tenders for building management services and supplies.

Greening the supply chain 5.1

Context

By establishing collaborative relationships and focusing on performance requirements, the supply chain can play an important role in helping property organisations and their tenants become more sustainable – financially, environmentally and socially.

To achieve environmental outcomes, levels of engagement with suppliers vary from straightforward purchasing of materials with minimal environmental impact (e.g. cleaning products, office consumables), to selecting contractors based in part on their environmental record and willingness to collaborate on joint environmental initiatives (e.g. cleaning and maintenance companies, security contractors and managing agents, waste and recycling contractors and fitout contractors and their subcontractors). These joint sustainability initiatives may be instigatedby property owners, managers or tenants. However, it can be very effective if building owners, managers and tenants collaborate because if tenants are encouraged to bring about improvements that assist base building initiatives this, in turn, can have positive outcomes on a range of issues from waste minimisation and recycling to indoor environment quality improvements. Alternatively, environmentally sustainable initiatives brought about by base building management will influence tenants to meet new benchmarks. The potential and feasibility of opportunities to engage the supply chain depend on the type of relationship, the nature of contracts, the scale of environmental risk, the potential reputation benefits and the capacity to share benefits.

Waste and procurement are inextricably linked. The life cycle of a product must be considered before a purchase is made. Increasingly, companies are offering 'take-back' on redundant electronic goods when replacements are purchased. If not, disposal must be considered. Can the redundant product be reused or recycled? How can this be achieved?

What's in this section

Steps: Engaging the supply chain in sustainability initiatives

The following steps are a guide to identifying opportunities and initiating improvements across the supply chain.

1 Identify environmental risks and opportunities in your supply chain

Identify the potential environmental risks and opportunities in your supply chain and how this relates to your business goals and stakeholder expectations. Ask the questions:

- To what extent does the supplier, and the nature of the supply contract, impact on managing environmental risks?
- How can you collaborate with suppliers to improve the environmental performance of products and services and reduce these risks?
- What are your stakeholders' expectations?

Identify your supplier groups

An important step in engaging your supply chain is identifying your different supplier groups. This will help you assess the level of influence you have with the supplier, the level of risk involved and hence help you prioritise your engagement approach. Worksheet 5.1A describes the increasing capacity to influence sustainability outcomes across four basic purchaser–supplier relationships.

Conduct a workshop

Make this step a collaborative, workshop-based exercise involving the people in your organisation responsible for procurement, tendering and contracts, environmental performance and operational management. Worksheet 5.1B provides a template for recording supply chain risks and opportunities.

An example of a risk is lack of proper training for cleaning staff leading to tenant dissatisfaction and unplanned maintenance costs if you are using waterless urinals. The cleaning contract needs to ensure there is adequate training and instructions for waterless urinals and reducing water use generally.

Working with our suppliers and contractors

Sustainable Supply Chain Management Pilot Program

'We are committed to operating our business in a responsible and sustainable manner and prefer to conduct business with like-minded suppliers. In 2007 we developed a draft Sustainable Supply Chain Management policy and Supplier Code of Conduct, and have piloted both documents with ten of our key suppliers.

To give us an understanding of the commitment of our top 100 suppliers, we reviewed their published statements in the areas of corporate governance, social responsibility and environmental management, including climate change risk and carbon management. From this group we selected ten key suppliers to work towards better aligned sustainability goals. These ten suppliers were selected on the basis of their understanding of CR&S. They are positioned in their market to influence their peers and their own supply chain. They are also representative of a range of goods and service providers that are important to our business, and together they represent 17% of our financial year expenditure.

Responses revealed that each of these suppliers have established policies and codes of practice such as safety, health and environmental management although few have commenced reporting on their social and environmental impacts. We provided confidential feedback to the suppliers to share and identify strengths and opportunities for improvement.

We intend to continue with this program by working with more groups of key suppliers, in forums and as part of our ongoing business. Our willingness to work collaboratively with our suppliers to develop CR&S goals and actions was well received and understood.'

Stockland, www.stockland.com.au

2 Communicate your commitments

Communicate your commitment to improving the performance of your supply chain to your customers and suppliers. This could be articulated through a sustainable procurement policy. Also consider including a statement in your organisation's sustainability or environmental policy making a commitment to, for example, 'engage and work cooperatively with suppliers to improve the environmental performance of their products and services'.

3 Develop engagement strategies

Use the risks and opportunities identified in Step 2 as the basis for developing engagement strategies that are specific to your different supplier groups (See Worksheet 5.1A). These could range from:

- simple screening of products, e.g. purchasing of more environmentally preferable goods such as recycled content paper
- minimum performance standards for suppliers and contractors, e.g. having an industry recognised environmental management system (such as ISO 14001)
- collaborating on joint projects e.g. reviewing a product design or providing training to cleaners on how to use the waste and recycling system, or
- working in partnership with suppliers for environmental improvement and cost effectiveness with a view to sharing the future benefits and demonstrating goodwill.

Worksheet 5.1C summarises the various approaches that can be taken, depending on the relationship level with suppliers (adapted from the Global Environmental Management Initiative 2001 Global Supply Chain Project incorporating Australian examples).

Designing your strategies: issues to consider

- Can the initiative be incorporated into existing procurement processes and tools i.e. be 'piggy-backed'? This will help prevent environmental requirements being seen as a new way to unfairly screen or pressure suppliers.
- Does it clarify requirements that are critical? For example, the scope of questionnaires should reflect what information is critical rather than what may be interesting to know.
- Can it be limited to one or two critical performance areas, such as greenhouse gas emissions or water conservation? Once progress has been demonstrated, the program can be expanded.

Investa's preferred supplier questionnaire

'Investa's preferred supplier questionnaire contains 50 questions covering a range of issues from OH&S compliance, environmental performance to training and community engagement. Each response is evaluated by the person engaging the provider, their line manager and the OH&S and Environment Manager before the provider is approved.

During 2007 Investa observed a significant increase in the quality of safety and environmental documentation supporting applications, which is a positive sign.'

Investa Property Group, www.investa.com.au

Delivering our sustainable supply chain management initiative

The Sustainability Advantage Program administered by the Department of Environment and Climate Change NSW (DECC) helps organisations to incorporate sustainability principles into their purchasing practices and across their supply chain. By linking them with procurement and sustainability expertise, the program helps organisations to set priorities and integrate environmental strategies into their procurement planning.

A Sustainable Supply Chain Management Policy and Code of Conduct among a small group of suppliers associated with a property development project has been implemented through the program. After refining the policy, DECC will roll it out to a wider group of suppliers, encouraging more organisations to address the sustainability principles set out in the policy.

For more information please contact Business Partnerships on (02) 8837 6000 or email sustainbus@environment.nsw.gov.au

- Do your suppliers understand your intentions and recognise the benefits of compliance for their own business development?
- Do you and your suppliers have the skills and resources required to deliver on your commitments? If not, what steps can you take to change this?

4 Implement your strategies

Implement your strategies and keep stakeholders up to date on your progress. To ensure your supply chain initiatives are successful you may need to consider:

- **Identifying a champion** within the supplier organisation who can lead the way in working with you. This may not necessarily be an individual responsible for managing the supply contracts or any specific environmental improvement projects but someone who can take senior management responsibility and maintain enthusiasm over the life of the project. Champions are likely to be successful where the supply contract is significant, lengthy or of high environmental risk, such as the provision of innovative environmental technologies.
- **Defining individual staff responsibilities** at the outset with a clear statement about which individuals in the purchasing organisation and supplier organisation need to do what, by when.
- **Agreeing on the documentation required to substantiate environmental performance claims** by the supplier and the purchaser. This is critical to ensure the purchaser employs an adequate due diligence process to avoid potential legal or contractual liabilities and to minimise the risk of 'green washing'. A potential first choice could be using products approved by the Australian Environmental Labelling Association (using their licensed 'Good Environmental Choice' label) or those listed on the Australian ecospecifier website database. If these are not appropriate and in-house verification is chosen, scientific rigour should be applied. Tools such as life cycle analysis and life cycle inventories could be helpful, as long as relevant data bases are used e.g. energy supply characteristics.
- **Initiating an education and awareness program** whereby your expectations are made clear to suppliers in a tangible and collaborative way, especially for longer term relationships. For example, Colonial First State Global Asset Management provides training for its managing agents on its sustainable property management procedures.

Product stewardship for electronic goods

Waste take-back and returning packaging to the manufacturer for reuse or recycling are becoming increasingly important issues. This extends producer and supplier responsibility. The onus is also on the consumer to recycle electronic waste (e-waste).

The NSW Government's *Waste Reduction and Purchasing Policy Guidelines* include the following suggestions:

- Look at the types of machines and consumables your organisation uses. Are they recycled? Will they be replaced? Who supplies them?
- Buying a networked multi-function (combined printer, photocopier, fax and scanner) reduces the number of individual machines in the office – however be aware that their increased printing capacity can increase paper use.
- Research which types of recyclable or remade machines are available. When replacing equipment ask potential suppliers if their machines take recycled cartridges. Understand the differences between different types of recycled cartridges.
- Avoid buying large and complex machines with lots of unnecessary functions – get something small, basic and robust.
- Rent equipment you only use occasionally.
- Find out if suppliers or other companies operate a take-back scheme for used machines or cartridges.
- Order cartridges with minimal packaging and in bulk if possible.

www.wrapp.nsw.gov.au/material/equip.shtml.

Also investigate opportunities for reuse of electronic equipment through charities or auction houses, or recyclers that specialise in e-waste.

www.environment.nsw.gov.au/warr/ewaste.htm

- **Developing a project delivery plan for collaborative research and development projects** including milestones and performance indicators for measuring and tracking outcomes. Indicators need to be based on simple and understandable metrics such as emissions per unit or embodied energy in J/kg, or water consumption in kL/unit.
- **Documenting the learning exercise** both within your organisation and if necessary within the supply organisation. This will enable knowledge to be more readily transferred from one supply contract to the next and will help to prevent staff changes disrupting longer term objectives.

Where a supply chain partnership is the preferred mode of engagement, ensure the project objectives are clear, e.g. asset or knowledge sharing, redesigned packaging, reduced transportation, environmental risk sharing, waste take-back including used machine and cartridge take-back, or product lease and landfill diversion. Also consider the 'embodied energy' in a product or service, that is, the direct and indirect energy requirements used in manufacture and delivery.

5 Measure and report the outcomes

Once supply contracts are let, it's critical that performance is monitored to ensure agreed objectives and levels of environmental performance are achieved. When key milestones are successfully achieved promote the improvement outcomes both internally and externally.

The promotion of successful initiatives may even provide that key differentiator within an organisation's competitive market, and as such promotion may be a business development necessity.

Promoting supply chain initiatives: issues to consider

- Are your staff interested? Supply chain projects are one means of demonstrating your commitment to being a sustainable organisation.
- Let your tenants and investors know you are committed to improvements. There will be opportunities to collaborate with tenants and achieve outcomes that suit their needs as well as yours.
- Can it be verified? Promotion attracts scrutiny, often by existing or potential tenants, and in some situations, by government or non-government organisations or consumer watchdogs. Some tenants, ethical investors or regulators may expect independent verification of your claims. For more information see The Australian Securities and Investments Commission (asic.gov.au and fido.gov.au).

Developing a supplier performance tool

'Our Commercial and Industrial Division has developed a supplier performance tool that enables them to identify and monitor quarterly the practices of the majority of their suppliers. The tool maps performance against a standard set of questions covering occupational health and safety, service level agreements, corporate responsibility and sustainability, along with financial and administrative performance indicators.

We use the results to identify areas for improvement. The process also encourages suppliers to expand and develop internal reporting systems to produce quarterly data for our review. The corporate responsibility and sustainability components of the assessment will be refined as we develop our sustainable policies, practices and processes.'

Sustainability and potential suppliers

'We're also considering sustainability principles in relation to potential suppliers. Our supplier selection process looks at whether a supplier's infrastructure fits with the principles embodied in our draft policy. Once on board, we work with suppliers to establish appropriate objectives and benchmarks to guide our working relationship.'

Stockland Corporate Responsibility and Sustainability Report

Lessons from multinationals

(The following list has been adapted and reprinted with permission from the publisher, Institute of Supply Chain Management and W. P. Carey School of Business at Arizona State University, 'Environment Supply Chain Management' by Ram Narasimhan, PhD, and Joseph R. Carter, D.B.A., C.P.M., (CAPS Research) 1999.)

Consider these key findings from research into multinational commercial property companies engaging with their supply chain :

- An early emphasis on environmental issues is important in supply chain relationships.
- The early integration of suppliers into all decisions affecting them is critical to environmental effectiveness.
- Safety and environmentally responsible processes are important criteria for supplier selection.
- Synergy between the company's strong environmental image and reputation, and environmentally sensitive products, is important.
- The close alignment of the supplier's capabilities with the purchaser's environmental goals is critical to a program's success. This can be achieved through an alliance that supports the supplier's organisational and informational framework and by benchmarking performance according to environmental, quality and cost parameters.
- Change should be viewed as a competitive tool and environmental efficiency viewed as a positive catalyst for change.
- Organisations need to carefully justify all environmental changes through either cost reduction or customer satisfaction issues.
- Using a customer-driven environmental management system along with standard operating procedures facilitates supply chain integration.
- Products and processes should be subjected to continual critical analysis at every stage of the value-adding process.
- The focus of continuous improvement used so effectively in total quality management programs can be applied quite effectively to improving environmental efficiency and effectiveness.
- Supplier audits on environmental issues require a cross-functional initiative involving employees from quality assurance, environmental affairs and purchasing.
- Using tools such as life cycle assessment and environmental audits improves environmental and operating performance.
- An open approach of communicating environmental information to the general public is needed.

Sustainable supply chain management at Westpac

'Westpac's public commitment to corporate responsibility includes a focus on working with its supply chain (including property asset management) to positively influence mutual social, ethical and environmental performances.

Aspects of this include:

- weighting sustainability performance in tender assessments
- setting minimum sustainability performance standards in contracts
- engaging suppliers committed to looking after their own responsibility through measures aligned with Westpac's values
- setting timeframes for continual improvement and monitoring progress
- expecting adequate environmental management practices within the supplying organisation
- requiring product stewardship and extended producer responsibility commitments by suppliers
- communicating company expectations through supplier open days and workshops
- facilitating best practice sharing of information between suppliers, as appropriate.'

Westpac. For further information see www.westpac.com.au/internet/publish.nsf/Content/WICR+Supply+chain

Benefits beyond the bottom line

One key aspect of improving supply chain environmental management is recognising business benefits above and beyond the bottom line.

(The following list has been adapted from Forging New Links, Global Environmental Management Initiative, 2004.)

Traditional cost avoidance

- Avoid unplanned costs.
- Improve operational efficiency.
- Reduce or avoid operating costs – lower waste disposal fees, less time and cost in reporting, lower utility and fuel costs.
- Avoid delays and downtime due to supply interruptions (e.g. environmental incidents).
- Improve cost competitiveness.
- Assure compliance with environmental regulations.
- Reduce environmental impacts – lower ecological footprint or carbon intensity.
- Reduce risk of accidents, reduce liability and lower health and safety costs.
- Improve employee and community health through cleaner air and water, less demand for landfill and less demand for resources.

Value creation

- Improve image, brand and goodwill – raise brand recognition.
- Reduce risk to reputation, marketing credibility and customer relations.
- Better satisfy tenant expectations.
- Enhance relationships with key suppliers – work in partnership with suppliers.
- Simplify compliance with potential future environmental regulations.
- Improve ability to demonstrate due diligence.
- Initiate new product development – hence business opportunities.
- Improve competitive position due to proprietary technology.
- Broaden access to ethical investors.
- Enable competitive entry into global ethical property markets.
- Support the organisation's environmental and social sustainability vision, strategy and policy.
- Boost longer term business viability.

Further information

Product and material labelling and standards

- NSW Government Sustainable Procurement Program, www.greengoods.nsw.gov.au/index.htm
- Good Environmental Choice, Australian Environmental Labelling Association (AELA), www.aela.org.au
- Sustainable Choice, a NSW local government sustainable procurement program, www.lgsa-plus.net.au/www/html/956-sustainable-choice.asp
- ecospecifier, www.ecospecifier.org
- Australian green procurement, www.greenprocurement.org
- International Standards, www.iso.org
- Standards Australia, www.standards.org.au
- Healthy Building Network, www.healthybuilding.net
- 'Reputation or Reality – A Discussion Paper on Greenwash and Corporate Sustainability', Total Environment Centre 2005, www.tec.org.au
- Buy Recycled Business Alliance, www.brba.com.au
- The Australian Securities and Investments Commission, ASIC Regulatory Guide 65 Section 1013 DA Disclosure Guidelines December 2003, www.asic.gov.au and www.fido.gov.au

Evaluating product design and environmental performance

- Commonwealth Government, www.deh.gov.au/settlements/industry/finance/publications/producer.html
- Design Institute of Australia, www.dia.org.au
- Industrial Designers Society of America, www.greenbiz.com/resources/resource/designgreen-materials
- Minnesota Office of Environmental Assistance, www.moea.state.mn.us/berc/dfetoolkit.cfm

Life cycle assessment

- Department of Environment and Climate Change NSW, Waste Reduction and Purchasing Policy:
  www.wrapp.nsw.gov.au/whatis/index.shtml
  www.wrapp.nsw.gov.au/whatis/wrapploop.shtml
  www.wrapp.nsw.gov.au/material/equip.shtml
- Department of Environment and Climate Change NSW, Waste stream – computer and electronics (e-waste), www.environment.nsw.gov.au/warr/ewaste.htm
- Australian LCA Network, http://auslcanet.rmit.edu.au/home.html
- International Standards, 14040 to 14044 LCA, www.iso.org
- RMIT, lca@rmit.edu.au, http://simapro.rmit.edu.au/lca/datadownloads.html
- Environmental Impact Estimator, www.athenasmi.ca
- CSIRO, www.csiro.au.

Worksheets

Review and use these Word documents:

5.1A Supplier relationships

5.1B Supply chain risks and opportunities

5.1C Supplier engagement strategies.

Worksheet 5.1A

Supplier relationships

Level	Relationship	Capacity to influence sustainability outcomes
Level 1 **Spot purchasing**	There is little or no relationship with or knowledge of the supplier. Price is the key determinant of purchase. Quality is assessed on predictable product characteristics or supplier reputation alone. Each transaction is its own business contract. Commodity items such as landscape materials, mops and pencils are often purchased on the spot market.	To control sustainability impacts, the opportunity exists to change products or product environmental performance specifications. For example, you could specify the purchase of wood products made from certified sustainable forestry sources, such as plantation timbers, and prohibit the purchase of any products made from old-growth forest resources. You could also prescribe that all paper and consumables – from printer paper to toilet paper – have a minimum recycled content.
Level 2 **Competitively-based incumbent**	Suppliers have a longer term business relationship, typically an annual contract against which purchase orders are issued. Contracts are renewed annually. Your business is theirs to lose. Relatively little technical cooperation is invested in these short-term relationships because a better supplier may be located in the next year. Examples include minor electrical and plumbing products and services.	To control sustainability impacts, change specifications for the annual bid and let the market know you are always looking for suppliers who can better meet these specifications. New performance levels may include materials not to be brought on site or recycling and removal of packaging waste.
Level 3 **Preferred supplier**	The intention is for a long-term relationship that requires and benefits from fairly frequent communication and collaboration to improve or adjust supplier inputs over time. Examples may include contracts for building maintenance or management services.	To control sustainability impacts, environmental and social sustainability performance issues are discussed and targets may be set. Performance-based contracting provides an opportunity for environmental benefits and resulting cost savings to be shared between both parties (e.g. through energy efficient lighting).
Level 4 **Strategic partnerships or alliances**	Relationships involve an even deeper level of commitment. Typically, there is an explicit or implicit understanding that supplier and purchaser will share the business benefits of effective collaboration. Those benefits may be to corporate reputation as well as bottom line economic benefits.	To influence sustainability impacts, add environmental or social sustainability items to the agenda of issues the partnership must address. Write contracts so the business value of better sustainability performance is shared among the partners. Examples may include long-term or portfolio-wide contracts for managing agent services or service agreements with design firms to achieve building or fitout environmental targets e.g. a 5-star Green Star rating.

Source: Adapted from ‘New Paths to Business Value’ Global Environmental Management Initiative, 2001: Global Supply Project. ‘Forging New Links: Enhancing Supply Chain Management Through Environmental Excellence’ 2004 www.gemi.org/supplychain

Worksheet 5.1B

Supply chain risks and opportunities

This is an example only – adapt this worksheet to suit your organisation's requirements. The first category is completed as a guide: identify your own business goals and objectives and insert your opportunities and risks.

Business goals	**Potential environmental risks and opportunities**	**Suppliers' contributions to these risks and opportunities**	**Response: how to collaborate with suppliers to deal with the risk or opportunity**
Reduce operating costs	Organisations sending significant amounts of waste to landfill may be incurring higher operating costs and placing a greater burden on scarce landfill facilities.	Suppliers may be using excessive packaging for products sent to purchasers or providing products in units that cannot be reused.	Work with the suppliers to help them reduce their packaging materials, or implement a packaging 'take back' program—thereby reducing the purchaser's need to handle and dispose of waste and the supplier's material handling requirements.
Increase revenue			
Protect reputation			
Reduce legal liability			
Add others			

Worksheet 5.1C

Supplier engagement strategies

Level of supplier (refer w'sheet 5.1A)				Engagement strategy	Comments and examples
1	2	3	4		
Stage 1: Pre-screening communications between purchaser and supplier					
	●	●	●	Environmental and procurement policies distributed to suppliers.	Raises awareness of the organisation's environmental procurement goals and sets the tone for future collaboration. For example, Telstra has a web page giving directions to its supply chain, including facility management services and suppliers.
	●	●	●	Code of conduct for suppliers	Communicates how business will be done with suppliers, including standards to be achieved, and may warn suppliers of unethical practices. Optus promotes its code via supply tenders. Westpac provides detailed guidance notes to suppliers to ensure its supply chain policy is well understood.
	●	●	●	Minimum environmental performance standards	Contracts often specify a level of environmental performance based on recognised standards. Colonial First State Global Asset Management (CFSGAM) sets environmental performance standards in its cleaning specifications. Ford requires all key suppliers to have in place an EMS certified to ISO 14001.
●	●	●	●	Product specifications	Product specifications can detail environmental performance requirements as well as other functional, aesthetic and value-for-money requirements. Many companies specify office paper based on its recycled content. Paints are often specified as low or no volatile organic compounds (VOCs) or timber as being from certified sustainable forestry sources.
●	●	●	●	Lists of materials to avoid	Some organisations circulate lists of chemicals or toxic materials their supply chain is to avoid. Such lists require regular updating and require some form of verification by suppliers when delivering orders. Kodak, Canon, Toyota and Ford produce such lists. The Sydney 2000 Olympic Games procurement contracts included a list of packaging materials not to be delivered to Games venues. Also check for companies and suppliers who offer to take-back packaging for reuse or recycling, or take back used electronic equipment (e-waste) and printer cartridges. www.wrapp.nsw.gov.au/material/equip.shtml www.environment.nsw.gov.au/warr/ewaste.htm

Level of supplier (refer w'sheet 5.1A)				Engagement strategy	Comments and examples
1	2	3	4		
Stage 2: Qualifying and negotiating with suppliers					
●	●	●	●	List of pre-approved materials	Lists of pre-approved materials can streamline internal procurement decisions. Suppliers need to submit expressions of interest to gain pre-approval status. Organisations wanting to use environmentally friendlier materials often use lists provided by specialists such as ecospecifier or Buy Recycled Business Alliance.
	●	●	●	Requests for proposals (RfP)	RfP for significant supply items or services can include environmental selection criteria the tenderers must address.
	●	●	●	Surveys and questionnaires	Organisations require suppliers to complete self-assessment forms. This common approach requires some level of technical capability on behalf of the purchaser. Pro-forma questionnaires exist, including a detailed product environmental data sheet initiative by the Australian Government. See also www.ecospecifier.org/knowledge_base/downloads/epds_long_questionnaire and www.nzbcsd.org.nz/supplychain/SupplyChain.pdf.
	●	●	●	Required standards of performance	Technical standards are often referenced in tenders and supply contracts are often based on applicable Australian standards or relevant international standards (e.g. ISO). Examples include the Forest Stewardship Council (FSC) certification, Good Environmental Choice labelling and ISO standards for construction materials. Sydney 2000 Olympics required key procurement contracts to include an extensive environmental tender specification.
		●	●	Supplier selection criteria/ranking	Where detailed environmental performance specifications are included in the tender selection process, it's a good idea to include the selection criteria in the information for tenderers. Sydney 2000 Olympics used a 26-point selection criteria assessment that was weighted to reflect the importance of environmental performance in the procurement contract.
●	●	●	●	Pre-approved supplier lists	A number of organisations create pre-approved supplier lists generated from responses to stage 1 pre-engagement screening. Serco-Sodexho produces lists of various suppliers that have demonstrated an ability to meet their required environmental standard. Tendering is based on price and delivery program and therefore time on both sides is reduced. Government departments use extensive pre-approved supplier panels.
	●	●	●	Contract negotiations	Depending on the scope of environmental risks, some facility management or construction contract negotiations may include environmental specialists within the purchaser and supplier organisations. This arrangement ensures transparency and a higher level of scrutiny of the supplier's environmental claims.

Level of supplier (refer w'sheet 5.1A)				Engagement strategy	Comments and examples
1	2	3	4		
Stage 3: Monitoring and continuous improvement					
	●	●	●	Performance audits	Regular audits of performance (self-audit or external audit) are common on large procurement and supply contracts in the construction industry and major infrastructure projects. Some contracts may require a self audit by the supplier, together with an annual verification audit by an independent specialist. Contracts requiring certification to ISO 14001 often require copies of the certification and re-appraisal audits before payments are made.
		●	●	Regular visits to suppliers	Purchasers may regularly visit supplier operations to inspect quality and look for incremental improvement. The NSW RTA undertakes such visits.
	●	●	●	Performance reviews	Regular performance reviews between the supplier and purchaser may include environmental performance reporting.
	●	●	●	Project-related partnering	Some supply chain initiatives can provide win-win solutions for supplier and purchaser. Often these arrangements will be subject to a partnering agreement where both parties share information and work collaboratively to achieved agreed objectives. Examples include energy performance contracts.
		●	●	Supplier training and awareness development	CFSGAM provides training and awareness to its managing agents on the company's sustainability policy and procedures. City Rail holds environmental health and safety (EH&S) training for suppliers, and many construction projects include suppliers in environmental inductions.
			●	Collaboration on R&D and new product development	Intel works with suppliers and cross-functional teams to design new semiconductor manufacturing tools that will operate with minimum EH&S impacts.

Source: Adapted from 'New Paths to Business Value' Global Environmental Management Initiative, 2001.
Global Supply Chain Project, 'Forging New Links: Enhancing Supply Chain Management Through Environmental Excellence', 2004,www.gemi.org/supplychain

Sustainable services and supply through tendering

5.2

Context

This section contains advice about how to use the tendering process to support your sustainability goals.

Because it sets the ground rules for ongoing relationships, the tendering process is the ideal opportunity to instil sustainability goals into a property's management regime whether this be base building management or the tenant's management of their internal operations, fitout and procurement. By detailing your expectations in regard to performance standards and sustainability, and by vetting prospective service providers, the tendering process has a crucial role in maintaining desired environmental and social outcomes in the long term. As well as detailing your requirements, the tendering process needs to help contractors, managers and suppliers understand the role they will be expected to play in supporting the required environmental and social outcomes.

For day-to-day purchasing of goods and services, sustainability goals can be supported by developing and implementing a purchasing policy that includes sustainability provisions. (See Section 5.1: 'Greening the supply chain'.)

What's in this section

Steps: Integrating sustainability into the tendering process

The following steps can be integrated into your existing procurement processes:

1 Determine thresholds

Determine the threshold at which sustainability criteria and performance standards will be included in tender and contract specifications. To determine this threshold consider:

- potential environmental risks related to the provision of this service or supply
- risk to your sustainability goals for the property, including the ability of the service provider or supplier to maintain or achieve the desired performance outcomes (e.g. efficient

energy or water use, reduction in waste, NABERS Energy and other NABERS ratings

- the impact on your organisation's sustainability objectives and commitments.

See www. nabers.com.au

2 Adapt tender documents to include sustainability provisions

Oversee the tendering process so your property's or tenancy's sustainability requirements are integrated with your organisation's overarching sustainability goals.

Include sustainability provisions in the tender documents. To follow an example, use the environmental specifications and criteria set out in Worksheets 5.2A and 5.2B and adapt these to suit the tender scope and your organisation's requirements.

Make sure there is a process in place to respond to and record queries or concerns expressed by prospective tenderers.

3 Include sustainability in the evaluation process

Include in the evaluation process a thorough review of the tenderers' track records and require them to demonstrate their commitment to improving sustainability performance.

Key questions

- Is the service provider or supplier able to measure and report sustainability performance?
- Is the organisation committed to increasing its staff skills in this area?
- Does the organisation understand the importance of its role in delivering sustainable and efficient buildings?
- Is the organisation committed to working with subcontractors, e.g. cleaners or waste and recycling contractors, to ensure the commitments are implemented on the ground?

Tender evaluation process

Set up a consistent process for evaluating tenders. This includes establishing weightings for the various sustainability criteria which reflect their relative importance and level of risk. To follow an example, the evaluation team could use an evaluation form such as Worksheet 5.2C.

Worksheet 5.2C is designed to be used to record and assess the tenderers' responses to your key requirements. This form is based on the provisions set out in the model environmental specifications (Worksheet 5.2A).

The evaluation can be applied to a pre-qualification process or to a tender response. It must be made clear to applicants of both the pre-qualification or tender processes that the form requires detailed responses to all criteria.

Importantly, this evaluation is intended to support the selection of the most desirable service provider or supplier. It must identify commitments made during the tendering stage which should be included in the contract, service or supply agreement. This evaluation can supplement any other evaluation undertaken to enable a procurement decision to be made.

Although the evaluation form is designed for any service provider or supplier, allowance should be made for the assessment of small companies or companies providing a very limited scope of services.

The evaluation form is intended to be selective and easy to use. However, where environmental or social risks are significant, or key areas of performance are required, the checklist should be expanded to deal with some areas in more detail. For example, standard OH&S components could be expanded to include other social issues such as labour practices, and additional detail about previous experience or capabilities could be requested, etc.

If necessary, ask a tenderer to provide further information to clarify or support their tender response. Make sure the tenderer understands that, if insufficient information is provided to enable an adequate assessment, the tender may be rejected. Keep all documents associated with the selected tenderer for future reference.

Further information

- *Environmental purchasing checklist – Building management and tenant property services*, Australian Government Department of the Environment, Water, Heritage and the Arts, www.environment.gov.au/settlements/publications/government/purchasing/building-mgt.html
- National Australian Built Environment Rating System, www.nabers.com.au
- For guidance in the preparation of an Environmental Management Plan and Waste Plan refer to Green Star Office Design version 3, Categories MAN-6 and MAN-7, www.gbca.org.au/green-star/rating-tools/

Worksheets

Review and use these Word documents:

5.2A Specifications for building management services and supplies

5.2B Criteria for building management, waste and cleaning services

5.2C Evaluating tenders for building management services and supplies

Worksheet 5.2A

Environmental specifications for building management services and supplies

This worksheet contains inserts which can be adapted and used in tender and contract specifications for building services and for supplies. This is an example only – adapt this worksheet to suit your organisation's requirements.

The desired outcome is to ensure the tender selection process appropriately addresses the environmental and social risks attributable to the product or service. See also Worksheet 5.2B for environmental criteria for building management, waste and cleaning services and Worksheet 5.2C for the environmental evaluation of tenders for building services and supplies.

Part A: Inclusions for conditions of tendering and preliminaries

Environmental management

Background

The [*building owner/building manager/managing agent/tenant*] is committed to maximising environmental and social sustainability outcomes within the properties it owns and manages.

The operation of commercial properties entails environmental and social impacts related to energy and water consumption, emissions, waste and the consumption of a range of products.

The [*building owner/building manager/managing agent/tenant*] is committed to take all reasonable measures, through the execution of this contract, to mitigate these impacts and improve the environmental performance of the building.

The [*building owner/building manager/managing agent/tenant*] therefore requires Tenderers to be aware of its environmental management requirements and to take active measures as described in this tender to adequately address these in response to this tender.

Consequently, this tender includes [XX, identifier number] **Schedule of Environmental Management** (Attachment 1) which is to be completed by the Tenderer and returned with the Tenderer's response.

Failure to submit a response to [XX] Schedule of Environmental Management will constitute a non-conforming tender.

Key terms and outcomes

Notwithstanding any other requirement in the contract, the [*building owner/building manager/managing agent/tenant]* requires all building services associated with its properties or projects to take adequate consideration of and demonstrate compliance with the following outcomes:

- efficient use of energy including electricity, gas and other forms of energy consumed in the property
- conservation of water and promotion of water and wastewater recycling and reuse
- avoidance of materials that are toxic or create undesirable emissions or discharges or impact on indoor environment quality (including air quality)
- reduction of solid waste being disposed (e.g. in landfill) through increased reuse, recycling and waste avoidance practices

- compliance with all relevant environmental laws, regulations and standards of good practice
- the implementation of a structured and systematic process within building management practices to achieve the above and demonstrate an adequate level of environmental due diligence, and
- if specified, the achievement of agreed levels of building environmental performance as demonstrated through building environmental ratings e.g. the National Australian Built Environment Rating System (NABERS) including NABERS Energy, Water, Waste and Indoor Environment, and the Green Building Council of Australia's Green Star rating system.

Tender requirements

All Tenderers are required to provide:

1 details of relevant experience – listing projects and briefly describing relevant experience brought to this contact

2 a minimum of two written references from current or previous clients where the tenderer undertook a similar provision of service or supply of products

3 a copy of the Tenderer's Environmental Policy (or similar)

4 a copy of the Tenderer's Environmental Management System (EMS) or similar system that details:
  – how environmental risks are managed within the Tenderer's business activities (not limited to this service or product)
  – the approach to identifying responsibilities for environmental management within the Tenderer's company
  – the nature and extent of environmental awareness and skills training provided to staff and contractors, and
  – measures implemented by the Tenderer to monitor and report on the company's environmental performance

5 details of the Tenderer's understanding of sustainability in relation to the environmental performance of buildings, including understanding of the NABERS rating system (including NABERS Energy, Water, Waste and Indoor Environment) and the Green Building Council of Australia's Green Star rating system

6 details of the Tenderer's performance in relation to environmental regulations over the last five years including any judgements against the tenderer under any State or Federal environmental legislation

7 details of the Tenderer's environmental and sustainability reporting (including corporate responsibility)

8 details of the Tenderer's environmental performance and experience with similar buildings/similar products with respect to the key outcome areas noted in this tender, section [XX] Schedule of Environmental Management

9 *[optional]* details of the Tenderer's proposed approach to environmental management of the services provided under the proposed contract, specifically an outline Environmental Management Plan (OEMP) for the building or service. The OEMP should be an **overview** only of the approach to be taken to achieve a high level of performance including energy efficiency, water conservation and reuse, waste and recycling management, noise management, indoor air and environment quality, pollution minimisation and, where defined in the contract, the buildings target environmental ratings. The OEMP should include an overview of the allocation of

responsibilities within the Tenderer's team, training of staff, management of subcontractors' environmental performance and project monitoring and progress reporting.

[Note to procurement manager: Requesting an OEMP is helpful if you wish the tenderer to demonstrate their understanding and approach to managing environmental issues. It will depend on the building, controls or management plans in place.]

Note to Tenderer:

The OEMP is to include an **overview** only of the structure and scope of issues to be addressed and the general approach to be taken by the Tenderer to integrate the plan into the Tenderer's building management structure. It is not expected to include significant specific detail on methodology, actions, work instructions, progress reporting etc. Providing a copy of a similar plan for a previous project by the Tenderer would be helpful.

The selected Contractor will be responsible for completing the plan in sufficient detail to enable it to be approved for use by the [*building owner/building manager/managing agent/tenant*] prior to commencement of the contract.

Part B: Contract requirements

Note: This section contains the additional environmental requirements that the successful Tenderer (the Contractor) must comply with during the course of the contract. The information below could be inserted into a preliminaries subsection titled 'Environmental management'.

Detailed Environmental Management Plan (EMP)

The Contractor shall be required to prepare and implement, to the satisfaction of the [*building owner/building manager/managing agent/tenant]*, a detailed Environmental Management Plan (EMP) for the building.

No contract activities, other than those deemed by the [*building owner/building manager/managing agent/tenant]* as not having any environmental consequence, shall commence until the completed EMP is accepted by the [*building owner/building manager/managing agent/tenant]*.

The EMP shall address all environmental performance areas and environmental outcomes described or specified in the contract with particular reference to key performance areas such as environmental ratings or other defined initiatives in energy and water conservation, waste minimisation; indoor air quality, protection of the natural environment, as well as compliance with any relevant or applicable statutory environmental requirements.

The EMP shall also include:

- standard work practices that manage risks in these key performance areas, and
- measures the Contractor will take to monitor, audit and report progress to the [*building owner/building manager/managing agent/tenant]*.

The EMP shall be an integral component of the Contractor's building management system, and progress against it will be regularly reviewed by the [*building owner/building manager/managing agent/tenant]*. (For guidance in the preparation of an Environmental Management Plan and Waste Plan refer to Green Star Office Design version 3 Categories MAN_6 and MAN_7.)

Attachment 1: [XX] Schedule of Environmental Management

[XX] Schedule of Environmental Management

[for inclusion in tender documents]

[Tender no. #####]

[Tender name]

Company information	
Company name and contact details:	

1 Relevant experience:

List projects the tenderer has undertaken that demonstrate relevant experience.	Value ($)
a.	
b.	
c.	
d.	

2 References: provide written references from at least two recent clients demonstrating company environmental commitment and experience.

	Company 1	Company 2	Company 3
Client:			
Contact name:			
Phone number:			

Environmental policy and environmental management:
Attach supporting information as necessary.

3	Tenderer's Environmental Policy	
4	Tenderer's Environmental Management System (EMS) or similar system (see Clause 4 under 'Tender requirements')	
	Describe how responsibilities and accountability are defined within the Tenderer's management system to cover principal areas of environmental risk.	
	Describe environmental awareness and skills training provided to Tenderer's staff and contractors.	

5	Describe the Tenderer's understanding of sustainability in relation to building performance, including the NABERS rating system (NABERS Energy, Water, Waste and Indoor Environment) and the Green Building Council of Australia's Green Star rating system.	
6	Describe the Tenderer's performance in relation to environmental regulations over the last five years including any judgements against the tenderer under any State or Federal environmental legislation.	
7	Describe the Tenderer's environmental monitoring and corporate reporting (e.g sustainability reporting processes).	
8	Describe the Tenderer's environmental performance and experience on similar contracts with respect to the following key outcome areas *[list them here]*:	
9	*[optional]* Provide an outline Environmental Management Plan as per the minimum scope detailed in clause 9.	

Service or product supply requirements Attach supporting information as necessary.		
	[Insert specific clauses relating to building management, cleaning or waste management. See Worksheet 5.2B for examples.]	

Worksheet 5.2B

Environmental criteria for building management, waste and cleaning services

This material is adapted from 'Environmental purchasing checklist – Building management and tenant property services' by the Australian Government Department of the Environment, Water, Heritage and the Arts, www.environment.gov.au/settlements/publications/government/purchasing/building-mgt.html. These specifications apply to all Australian Government tenders for building management services, tenant property services, and waste and cleaning services and can be adapted for your own organisation.

These recommendations are primarily directed at government departments and agencies, but they may also be appropriate for tenders for privately owned buildings. This is an example only – adapt this worksheet to suit your organisation's requirements.

Suggested wording to define sustainability requirements is accompanied by evaluation weightings. **These weightings are indicative only**. Your organisation will need to determine its own weightings based on the relative importance of each category to your organisation. The guidelines do not include advice about how the environmental weightings compare to other tender evaluation criteria such as price, capacity to deliver, experience etc.

Consideration will be given to service providers	**Information required from companies**	**Weighting** (total = 100%)
Building management and tenant property services		
... that can demonstrate capacity to improve the environmental performance of buildings.	Document your capacity and previous experience in energy and water efficiency, waste management and green cleaning programs. Details should identify your company's role in each program, i.e. developed innovative programs, initiated tried-and-true programs, implemented program designed by others, participated without major responsibility, etc. Describe challenges your company faced in previous programs and how they were overcome. Identify similarities and differences between buildings previously managed and building covered by this specification, with respect to energy use or other environmental factors.	20–30%

Consideration will be given to service providers	**Information required from companies**	**Weighting** (total = 100%)
… that are committed to improving the energy and water efficiency of the building.	Identify how you will meet the Australian Government requirement for conduct of an energy audit within one year of occupation and at least every five years after that. However, to maintain your NABERS ratings, the property needs to be rated every year. Specify how the recommendations of the audits will be evaluated and implemented. Describe your approach to the conduct of water audits.	20–30%
… that are committed to delivering high-level support to waste minimisation and recycling systems.	Describe the types of services that will be provided to promote waste minimisation and recycling for both base building and tenants.	5–15%
…. that are committed to eliminating use of hazardous cleaning products wherever possible.	Document previous activities that focused on use of non-hazardous products. Describe any previous involvement in testing use of non-hazardous cleaning products. Provide a proposed plan of action for a cleaning program based on using low-hazard products wherever possible.	5–15%
…. that use systems that ensure that cleaning methods are efficient.	Document your methods for ensuring that cleaning is carried out to a high quality. For example, show the systems you use to ensure that separated tenancy waste is kept separate from building waste. Describe how your cleaning system and cleaning equipment, including vacuum cleaners, remove dust and debris from the premises. Include your procedures for filter management and efficiency of cleaning machines.	5–15%
…. that are committed to minimising use of toxic pesticides wherever possible.	Document previous activities that focused on use of non-toxic pesticides. Describe any previous involvement in testing use of non-toxic pesticides. Provide a proposed plan of action for a pest prevention program based on using non-toxic pesticides wherever possible.	5–15%
... that agree to comply with and enhance [the organisations]'s energy efficiency program.	Outline your understanding of current [organisation] energy efficiency activities for the facility or building. Describe your understanding of requirements for agencies and departments under the Australian Government Energy Policy. Describe what you would do to build on the existing program.	15–25%

Consideration will be given to service providers	**Information required from companies**	**Weighting** (total = 100%)
... that document additional environmental benefits of their services or superior environmental performance.	Provide appropriate documentation.	5–15%
. . . that can demonstrate a clear understanding of what constitutes good indoor environment quality.	Outline the process your organisation uses for the testing, management and improvement, if required, of indoor environment quality.	20-25%
Waste services		
… that are committed to delivering high-level support to waste minimisation and recycling systems for both base building and tenants.	Describe the types of services that will be provided to promote waste minimisation and recycling. This could include specification of bin types, educational material and monitoring and reporting systems. Document experience in implementing similar commitments elsewhere.	20–25%
… that are committed to recycling the most waste materials.	Specify which materials you will recycle.	20 - 25%
… that are committed to responsible disposal of non-recyclable waste streams.	Provide commitments to responsible disposal of non-recyclable waste streams. For example, you might commit to one or more of the following: • Industry codes of best practice will be adhered to. • Waste will only be disposed of in a landfill fitted with a landfill gas collection system to reduce greenhouse gas emissions. • Any hazardous waste will be separately managed using appropriate vehicles and a waste tracking system. • An audited system will be established for reporting disposal arrangements, including landfill receipts. Document experience in implementing similar commitments elsewhere.	20-25%

Consideration will be given to service providers	**Information required from companies**	**Weighting** (total = 100%)
... that document additional environmental benefits of their services or superior environmental performance.	Provide appropriate documentation to support any environmental claims made. This should include, where possible: • a certified Quality Management System or Environmental Management System (if no companies tendering are certified, specify a date by which certification would need to be obtained). • a demonstrated track record, and • membership of industry associations.	5–15%
Cleaning services		
… that are committed to eliminating use of hazardous cleaning products wherever possible.	Provide details on other previous or current service contracts that focus on using non-hazardous products. Document procedures used to test non-hazardous cleaning products. Testing may be conducted by third party assessors, including on behalf of manufacturers. Document your procedures for logging and reporting on supplies and use of all cleaning products.	20–25%
...that present a systematic plan for phasing out or minimising use of hazardous cleaning products.	Provide detailed information describing procedures used to comply with relevant State regulations for control of hazardous substances in the workplace, with particular detail on risk assessment, use of the hierarchy of control, training and documentation. Provide details on any penalties or warnings received for violation of regulations related to hazardous substances in the workplace during the past five years. Describe the program you will institute to identify opportunities for eliminating hazardous cleaning chemicals. Describe the program and procedures you will adopt to identify, test and introduce alternative lower risk products. Document the procedures and materials used in training that emphasise minimum use of hazardous substances. Provide details of the documentation and reporting process that will be followed to keep [organisation] informed about progress in implementation of the program.	20-25%
... that are committed to use of products and packaging made from recycled materials.	Provide details on your current and proposed efforts to use products or packaging made from recycled materials.	5–15%

Consideration will be given to service providers	**Information required from companies**	**Weighting** (total = 100%)
... that are committed to recycling of waste materials.	Document your existing program for recycling of packaging and other materials. Describe the procedures you will use for recycling of cardboard and other recyclables from this property. Specify how you will ensure that cleaners handle recyclable materials separated by the property's occupants, and will keep recycled materials segregated from general wastes.	10–20%
... that agree to comply with the buildings energy and water efficiency programs.	Document procedures that will be used to ensure that cleaners minimise energy use by switching off lights in unused areas. Document procedures that will be used to ensure that cleaners minimise water use and report leaks	5–15%
... that document additional environmental benefits of their services or superior environmental performance.	Provide appropriate documentation to support any environmental claims made. This should include, where possible: • a certified Quality Management System or Environmental Management System (if no companies tendering are certified, specify a date by which certification would need to be obtained). • a demonstrated track record, and • membership of industry associations.	5–15%
Pest treatment services		
… that are committed to minimising the use of toxic pest treatments wherever possible.	Provide details on other previous or current service contracts that focus on using non- toxic pest treatments. Document procedures used to test non- toxic pest treatments. Testing may be conducted by third party assessors, including on behalf of manufacturers. Document your procedures for logging and reporting on supplies and use of all pest treatment products.	15-20%

Source: Adapted from 'Environmental purchasing checklist – Building management and tenant property services', Australian Government Department of the Environment, Water, Heritage and the Arts, www.environment.gov.au/settlements/publications/government/purchasing/building-mgt.html

Worksheet 5.2C

Environmental evaluation of tenders for building management services and supplies

This is an example only – adapt this worksheet to suit your organisation's requirements.

Section A: Company information

Company name:			
Type of business:			
Street address:			
Mailing address:			
Principal contact:		Phone:	Email:

Description of work under the Contract

Briefly describe:	
Applicable property:	

Section B: Relevant experience

Rate jobs listed by Tenderer against relevant experience	Job listed by Tenderer		Experience	
			Adequate	Inadequate
	1			
	2			
	3			
	4			

Has Tenderer worked on other [client] projects or properties in the last 3 years? If so, are there any concerns that need to be addressed?	

Environmental references provided by tenderer

	Company 1	Company 2	Company 3
Type of service provided:			
Client:			
Contact name:			
Phone number:			
Reference followed up (Y/N)			

Section C: Evaluation criteria

	Criteria	Ex [1]	Ad [2]	Inad [3]	Comments
C1	**Company policy and management**				
	Policy – Company environment or sustainability policy that clearly identifies the vision, objectives and commitment of the company (keep copy on file).				
	Understanding – Degree to which the Tenderer understands sustainability and building performance, including the NABERS rating system (NABERS Energy, Water, Waste and Indoor Environment) and the Green Building Council of Australia's Green Star rating system				
	Environmental Management System – EMS or similar system (e.g. QAS) that describes how environmental risks to the company are effectively identified, managed or mitigated.				
	Responsibilities – Are responsibilities and accountability clearly defined within the company's management system to cover principal areas of environmental risk?				
	Regulatory compliance – Any environmental or workplace penalties or infringements in the last 5 years?				
	Training – Adequacy of environmental awareness and skills training provided to company staff and contractors.				
	Monitoring & reporting – Adequacy of the company's environmental monitoring and corporate reporting processes.				
	Environmental experience – Capacity to demonstrate previous successful experience in environmental management and project-specific environmental outcomes.				
C2	**Environmental management plan** (where required)				

[1] Able to demonstrate **excellent** performance – above average capability or experience
[2] Able to demonstrate an **adequate** performance – acceptable minimum
[3] **Inadequate** performance – unable to demonstrate an acceptable minimum performance

Section C: Evaluation criteria

	Criteria	Ex [1]	Ad [2]	Inad [3]	Comments
	Environmental management – Adequacy of the outline EMP[4] submitted with the tender response. [if an EMP is required in the contract]				
	Environmental responsibility – Does outline EMP allocate responsibility and accountability to project staff, including using staff with appropriate skills and experience for the task?				
	Environmental training – What commitments does the Tenderer have on environmental training?				
	Management of subcontractors – How well does the Tenderer commit to managing subcontractors and major suppliers to achieve the environmental objectives?				
	Energy management – Measures the Tenderer will take to minimise energy use.				
	Water management – Measures the Tenderer will take to minimise water use.				
	Waste and recycling management – Measures the Tenderer will take to minimise waste and optimise recycling.				
	Cleaning – Measures the Tenderer will take to ensure cleaning is effective and minimises introduction of hazardous materials.				
	Pest treatment – Measures the Tenderer will take to ensure pest treatment is effective and minimises introduction of toxic materials.				
	Noise management – Measures the Tenderer will take to minimise noise disruption.				
	Air quality management – Measures the Tenderer will take to avoid toxic or nuisance emissions and maintain indoor air quality standards.				
	Monitoring – Adequacy of the proposed environmental monitoring procedures.				

[4] EMP – Environmental Management Plan

Section C: Evaluation criteria

	Criteria	Ex [1]	Ad [2]	Inad [3]	Comments
	Reporting – Adequacy of environmental performance reporting procedures or commitment.				
	Other environmental capabilities or experience offered by Tenderer.				

Assessor's name:	Phone:

Comment:	(Brief comment on whether the Tenderer has demonstrated sufficient experience, capability and commitment to meet expectations and requirements.)
Contract commitments	(Note if award of a contract or pre-registration should be conditional on Tenderer committing to an action, deliverable or outcome or providing further evidence of capability in a particular area before contract commences.)
Recommendation:	(Yes/No – to whether the Tenderer should be considered for the contract, or pre-qualification registration, based on sustainability criteria).

Assessor's signature:	Date: