

CASE STUDY 1

# Using an Environmental Upgrade Agreement to finance an efficient heating, ventilation and air-conditioning system



SCENARIO **End of life replacement**

TECHNOLOGY TYPE **HVAC**

## Situation

Company ABC Limited owns a multi-tenanted office building in the Sydney CBD and wants to replace the building’s existing HVAC system with a new one. They are considering two options with 47kW capacity: a standard rooftop packaged system, or a more expensive, more energy efficient system. The more efficient system includes features such as:

- Scroll compressors
- Three compressor stages
- Two speed condenser fans
- Economy cycle
- Supply air fan Variable Speed Drive (VSD)
- Demand controlled ventilation (utilising return air CO2 sensors).

## How does the energy efficiency system compare to the standard system?

The company first determines which system to install by calculating the expected cash flows and financial impact of each system. The lifetime cash flows are based on the following costs, electricity use and lifetime for each system.

Equipment type	Standard	EE
Cost to install (\$)	\$27,000	\$33,000
Operation and maintenance cost (\$ p.a.)	\$800	\$1,500
Electricity use (kWh p.a.)	192,000	131,300
Equipment life (years)	15	15
Electricity cost reduction in first year from EE (\$)		\$12,140
Simple payback period for EE (years)		3.1
Simple payback period for EE, with marginal capital (years) <sup>2</sup>		0.6

<sup>2</sup>The lower rate applies for EUAs above \$250,000.

### Annual cash flows comprise of the following:

- In the first year, the cost of installing the equipment
- In all years, the operating costs (including operation and maintenance, plus electricity costs) and tax impact of purchasing the equipment. The tax impact is the change in tax payable due to the change in operating costs and depreciation, which are tax deductible
- Electricity rate of \$200/MWh in year one, increasing each year by 2% (excluding inflation).

The company used these annual cash flows to calculate the following NPVs of installing each system.

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Item	NPV
Standard system	-\$277,686
EE system	-\$204,262
Difference	\$73,424

ABC Limited determined that it would be better off by about \$73,000 over 15 years if it invested in the energy efficient system. Even though the energy efficient system is more expensive to install, it results in much lower electricity costs throughout its useful life.

Based on this financial analysis, ABC Limited chooses to install the energy efficient system. As a portion of the energy cost reduction will be enjoyed by the tenants of the building, ABC Limited would like to pass on some of the cost of installing the more energy efficient system to its tenants.

### What is the effect of Energy Savings Certificates?

If ABC Limited installs the energy efficient HVAC system it could generate additional value by creating ESCs through the NSW Energy Savings Scheme.

ABC Limited calculated the number of ESCs it could create and the money it would receive from these certificates, less the tax it would need to pay on the sale of ESCs. It used the Project Impact Assessment with Measurement and Verification Method to determine the number of ESCs it could create. The potential net revenue from the ESCs was estimated at about \$3,300, further increasing the value of the energy efficient system. For more details on the assumptions and calculations ABC Limited used, refer to the cash flow model accompanying this finance guide.

### How do the various energy efficiency and renewables finance options compare?

ABC Limited calculated the expected cash flows and their NPVs for each finance option, including and excluding the expected value of generating ESCs. The results were as follows.

Finance option	NPV, no ESCs	NPV with ESCs	NPV rank	Comment
Environmental Upgrade Agreement	\$47,756	\$52,497	1	
On-bill financing	\$44,179	\$48,920	2	
Commercial loan	\$43,178	\$47,919	3	
Capital lease	\$42,564	\$47,305	4	
Self funded	\$42,937	\$46,256	5	
Operating lease	\$6,817	\$11,558	6	
Energy Efficient loan	N/A	N/A		Not considered as the project does not meet the minimum finance amount criteria

*ABC Limited decides to seek an Environmental Upgrade Agreement for its HVAC system. This type of finance provides a mechanism for the company to pass on some of the repayment costs to its tenants, and it results in the highest expected NPV. In addition, ABC Limited expects to sell its building in 5 to 10 years and is more comfortable with a form of finance that is tied to the building and will transfer to the new owner if the building is sold.*

FINANCE OPTION SELECTED

**Environmental Upgrade Agreement**

NEXT STEPS

**Refer to the process outlined in Section 5.1**