



CASE STUDY 9

Using on-bill financing to finance a new building management system

SCENARIO **End of life replacement**

TECHNOLOGY TYPE **Building Management System**

Situation

A property company owns and operates a mixed use building that includes office space and retail space. This building is served by a central air-conditioning system that is controlled by an out-dated building management system (BMS). This system is over 10 years old, no longer supported by the vendor, and does not provide a sufficient level of control to manage and optimise control strategies.

Replacing this system with a 'like for like' package will solve the redundancy issues, however installation and commissioning of a newer, smarter system including additional monitoring and control points can provide significant savings by:

- Using fresh air to provide cooling when conditions are correct
- Monitoring the amount of fresh air required, particularly during winter
- Speeding up or slowing down pumps and fans as required
- Providing automated alarms when control parameters move outside set limits, allowing contractors to fix problems quickly.

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 (\$)	\$100,000	\$200,000
Operation and maintenance cost (\$ p.a.)	\$5,000	\$5,000
Electricity use (kWh p.a.)	900,000	810,000
Equipment life (years)	10	15
Electricity cost reduction in first year from EE (\$)		\$18,000
Simple payback period for EE (years)		15.4
Simple payback period for EE, with marginal capital (years) ¹⁰		7.7

¹⁰This is the payback period for the EE option using the difference in capital outlay between the standard and EE equipment, rather than the full capital outlay for the EE equipment.

Annual cash flows comprise the following:

- The cost of installing the equipment. As the life of the efficient equipment is longer than the standard equipment, the NPV is calculated over the life of the efficient equipment, assuming additional capital cost for the standard equipment at the end of its life
- 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.

Item	NPV
Standard system	-\$1,317,043
EE system	-\$1,252,692
Difference	\$64,351

The company determined that it would be better off by about \$64,500 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 and lower operation and maintenance costs throughout its life.

Based on this financial analysis, the company chooses to install the energy efficient system.

What is the effect of Energy Savings Certificates?

If the company installs the new building management system it could generate additional value by creating ESCs through the NSW Energy Savings Scheme.

The company 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 the Measurement and Verification Method to determine the number of ESCs it could create. The potential net revenue from the ESCs was estimated at about \$4,800, making the energy efficient system more valuable for the company.

For more details on the assumptions and calculations the company used, refer to the cash flow model accompanying this finance guide.

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

The company calculated the expected cash flows and their NPVs for each finance option, with and without including the expected value of generating ESCs. The results were as follows.

Finance option	NPV, no ESCs	NPV with ESCs	NPV rank	Comment
On-bill financing	-\$64,317	-\$57,392	1	
Commercial loan	-\$70,384	-\$63,459	2	
Capital lease	-\$74,108	-\$67,183	3	
Self funded	-\$78,386	-\$73,538	4	
Operating lease	-\$108,405	-\$101,480	5	
Environmental Upgrade Agreement	N/A	N/A		Not considered as the project is not in a council area where Environmental Upgrade Agreements are available
Energy Efficient Loan	N/A	N/A		Not considered as the project does not meet the minimum finance amount criteria

The company is a customer of Origin Energy and decides to seek on-bill financing to finance its new building management system, as this results in the highest expected NPV.

FINANCE OPTION SELECTED

On-bill financing

NEXT STEPS

Refer to the process outlined in Section 5.2