BCA Green Mark and Building Retrofit

Building owners in Singapore - hotels, shopping malls and offices - are coming to realise the benefits of retrofitting when energy efficiency is taken into account. Building owners who embark on a retrofit utilising the Green Mark Incentive Schemes are seeing a considerable reduction in energy, as well as water bills, along with lower environment impact and the opportunity to get a better return in the leasing and resale value of buildings.

Globally, the buildings sector is responsible for 30-40% of total energy consumption. This significant proportion thus presents a good opportunity for targeted energy efficiency efforts. In Singapore, the Building and Construction Authority (BCA) launched the Green Mark Scheme in 2005 to drive the sector towards more environment-friendly buildings; with the target laid out in the Second Green Building Masterplan for at least 80% of all buildings to be Green Mark certified by 2030.

To achieve the target, many existing buildings will have to undergo retrofits to meet the criteria of certification. Even buildings with existing certifications will have to be re-assessed every three years to maintain the Green Mark status, thus requiring continual improvement to their environmental performance.

When Amory Lovins of the Rocky Mountain Institute visited Singapore recently and spoke at an NEA organised seminar, he strongly advocated retrofitting for energy efficiency.

"Old buildings can be better than new", he said. While there is the temptation to tear down and start afresh, Amory Lovins knows that smart retrofitting can mean up to 75% savings on energy use. He also refers to case studies of energy efficiency achievements through retrofitting in the United States, including the iconic Empire State Building, a Federal Government building in Colorado and Ford Motor Company dealerships.

Even as owners of existing buildings are warming up to retrofitting of their properties, challenges still exist in convincing building owners, especially those of smaller properties and developments with limited capital. Thus, to encourage owners of existing buildings to adopt energy efficient retrofitting design, technologies and practices, BCA has introduced incentive and financing schemes.

The Building Retrofit Energy Efficiency Financing (BREEF) Scheme finances up to $5 million for energy retrofits from loan-issuing financial institutions.

A showcase of some successfully implemented retrofits that obtained Green Mark certifications can be seen here. Highlighted here are the measures adopted that led to improved energy efficiency of the building. Buildings of various use and purpose are featured, and can serve as a guide and inspiration for building owners who are contemplating retrofits.
Hotels

In the hotel sector, Singapore’s tropical climate presents a heavy load on the air-conditioning system, which can consume up to 50% of a hotel’s total energy use. Thus, retrofitting efforts should concentrate on increasing the energy efficiency of the system. Chiller plant and lighting retrofit can cost between $1.9 million to $3 million, with an average payback period of 4.7 years.

A successful case study would be Furama City Centre, which obtained the BCA Green Mark Platinum certification, the highest green building accolade. Initiatives including installing energy efficient chiller plants, motion sensors for lighting and regular energy audits costing $1.7 million are expected to cut annual operating cost by $254,000.

Offices

For office buildings, having a Green Mark certification brings the additional benefit of appealing to companies with strong social responsibility. A study by BCA and the National University of Singapore (NUS) found that green office buildings can achieve average reduction in total operating cost of 13.3%, and an increase of 2.6% in capital value.

An example of a green office building would be Six Battery Road, which has the BCA Green Mark Platinum certification. During its retrofit program, an energy efficient chiller plant and thermal energy storage system were installed. This program is expected to save the building 25% of its energy cost.

Malls

Green building retrofits will lead to lower utility cost and improve the environment for mall tenants and shoppers. Retrofitted retail properties also stand to gain an average savings of 8.6% of total operating costs, and increase capital value of buildings by 1.7%, as found in a study by BCA and NUS.

Asset enhancement program at Bugis+, formerly known as Iluma, has installed redesigned chilled water and condenser water systems and energy efficient lights. This is expected to save 1.2 million kWh of energy and 4,470m$^3$ of water per year. This retrofitted retail destination has been awarded the BCA Green Mark Platinum certification on the back of this program.

Another outstanding example of a retrofitted green building is the National Institute of Education (NIE) Singapore’s campus, which was awarded the BCA Green Mark Platinum certification. Unnecessary lighting was eliminated and a network power monitoring system installed to manage energy use. The campus air conditioning chiller plant was retrofitted to a high efficiency one.
with just 0.6kW per refrigeration ton. Not resting on its laurels, NIE is continuing its improvement program by performing a lighting retrofit, and is studying the feasibility of installing solar photovoltaic panels.

These buildings are but just a few out of the almost 1,500 BCA Green Mark projects in Singapore. This demonstrates a growing commitment in the building industry towards minimising the environmental impact of buildings while providing a safe and healthy environment for occupants. Owners of existing buildings without the BCA Green Mark certification should consider undergoing a retrofit program soon. Being awarded one will bring benefits beyond cost savings and increased capital value, but also prestige in association with the certification. For buildings that are due for retrofits or renovations, owners will realise the benefits of retrofitting and see the payback benefits when energy efficiency is taken into account.

For more information on BCA Green Mark scheme, visit:


http://www.greenmark.sg/

For more information on incentive and financing schemes, visit:

Building and Construction Authority’s Green Mark Incentive Scheme for Existing Buildings (GMIS-EB)

Building Retrofit Energy Efficiency Financing (BREEF) Scheme

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