

Refurbishment: Analogue buildings go digital

Print

By Mike Scott

Published: April 24 2009 15:41 | Last updated: April 24 2009 15:41

It is estimated that more than 60 per cent of the buildings that will be standing in 2050 have already been built.

This makes it important to ensure that the move to cut emissions from buildings does not just focus on new developments.

"Retrofit is more difficult than new-build," says Anna Halcro-Johnson, technology acceleration manager at the Carbon Trust.

She explains: "You are constrained by the existing structure and it is difficult to get managers as enthused about existing buildings as it is to engage them over new projects. Many retrofits result in increased energy consumption."

Nonetheless, there are plenty of opportunities, exemplified by the recent news that the Empire State Building is to receive an eco-makeover.

The \$20m initiative, part of a \$500m overhaul of the New York icon, will cut energy use by more than a third, saving more than \$4m a year. The skyscraper's 6,500 windows will have new triple-glazed insulated glass to cut the need for cooling in the summer and heating in the winter. Insulation is to be added behind radiators to reduce heat loss, along with the introduction of daylight controls and plug load occupancy sensors, a retrofit of the chiller plant and an upgrade of the building control system to maximise the efficiency of heating and air-conditioning systems. Building tenants will also be able to use an internet system to check their energy use.

Another iconic building, London's Savoy Hotel, is also going green. The hotel, part of the Fairmont Group, is currently closed for a £100m (\$146m) refit. When it reopens, its energy consumption should be 40 per cent lower, resulting in a reduction in its carbon emissions of 3,000 tonnes a year.

The move was especially important because the refurbishment will include a new bar and the reopening of the hotel's River restaurant. "Without these measures, the refit would have meant our energy consumption went up," says Kiaran McDonald, general manager.

Gary Parke, chief executive of Evolve Energy, the energy management company that implemented the carbon reduction plans, says that refurbishments are an ideal opportunity to introduce energy efficiency measures. "Why spend £100m and keep 35-year-old boilers?" he asks. Evolve came up with a plan that gave the hotel a six- to seven-year payback on its investments.

The first step in any retrofit project is to measure current consumption, Mr Parke says. "You need to know what is happening before you start, so you can show what you have done and how effective it has been." This measurement identified a number of areas where improvements could be made.

The main change is that the hotel now has its own combined heat and power (CHP) plant, allowing it to generate its own electricity and heat*. CHP is best-suited to buildings with a high demand for heat. For hotels with laundry facilities or swimming pools that need heating, CHP can bring huge savings.

The gas-fired system will provide all the heat and hot water for the Savoy and about two-thirds of its electricity.

The Savoy is also installing heat exchanger technology that will allow all the heat expelled by its refrigerators and cookers to help heat the water supply. Food waste will be collected and used to generate electricity "and we are looking at whether it is feasible to convert our waste cooking oil to biodiesel", Mr McDonald says.

There will also be a sophisticated building controls system that allows conditions in each room to be controlled more effectively. "The systems to control room lighting and heating are linked to our property management system so that when guests leave their room, lighting is automatically switched off and everything goes to a pre-determined temperature," he adds.

"There is a lot of connectivity in the system. The key is to integrate as many aspects of the building as you can," says Mr Parke. "We live in a digital age – you cannot live in an analogue building."

However, despite the changes behind the scenes, Mr McDonald says guests should see no difference. "We want to position ourselves as the most environmentally responsible luxury hotel in London, but anything we do should not interfere with the level of luxury our guests enjoy."

Technology moves fast in this area and the Savoy will monitor developments to allow it to introduce further environmental improvements. One example of where this has already happened is in lighting. "We are installing fluorescent [energy-saving] light bulbs in as many places as possible," the general manager says, "something that we would not have been able to do for quality reasons even a year or two ago".

A future development might be in the fleet of luxury cars the hotel will offer for guests to hire. "We looked at the options in electric cars and they are not quite there yet. But we will explore opportunities as they arise. Being green is about attitude – it's important to be focused on this while not forgetting that we run one of the top luxury hotels in the world."

.....

Sky-high ambition

The Empire State Building stunned the world when it rose up in 1931 in the midst of the Great Depression, **writes Sarah Murray**.

Now, in similar conditions, an energy efficiency retrofit is in progress that aims not only to cut the building's energy consumption by up to 38 per cent, but also to provide a blueprint for multi-tenanted office blocks.

The project, due for completion by 2010 and part of a \$500m upgrade programme, brings with it an impressive team.

As well as the Empire State Building Company, the building owners, **Johnson Controls** will be the energy services company for the programme, while critical participants include **Jones Lang LaSalle**, the Rocky Mountain Institute and the Clinton Climate Initiative (CCI).

It was the CCI that immediately saw the potential of using the world's most famous office building to create a replicable process for reducing energy consumption and environmental impact.

Tony Malkin of the Empire State Building Company, says: "When I first went to the CCI, I suggested a building on Broadway that's 400,000 sq ft and a very plain box," explains Mr Malkin.

"They said: 'No, if we do the Empire State Building, we will get international attention.'"

Iain Campbell, vice-president and general manager of Johnson Controls, says: "Typically, people look at the shallow improvement measures, a tune-up. Here, there is a whole-system approach to achieving big energy-efficiency savings by way of a deep retrofit."

Equally important is a system that will allow tenants to measure their energy use via the web. Moreover, new occupants fitting out their offices will be able to use the energy efficiency standards set by the Empire State Building Company.

"So it's easier as a tenant to make those changes than it would be somewhere else," explains Paul Rode, the programme's executive project manager for Johnson Controls.

For the building owners, the benefit of the retrofit is not only the reduction in energy consumption.

"When we're talking about return on investment, all we are measuring is energy savings," explains Mr Malkin.

"But there will be a concomitant benefit – because it has been proven that better tenants want to be in better buildings, so you can make a building even more desirable with these changes."

Additional reporting by Sarah Murray

***An Irish nursing home has a CHP makeover:** [read at ft.com/energy-efficient-buildings-2009](http://ft.com/energy-efficient-buildings-2009)

Copyright The Financial Times Limited 2009