# How to turn existing buildings into sustainable, energy-saving structures

By Mark Freeman

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The building industry is experiencing unprecedented disruption due to a variety of trends, including the pandemic, ongoing technological transformation, market pressures, and evolving occupant expectations and needs.

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Yet, discussions continue to focus on what the building of tomorrow looks like instead of examining how current innovation such as the IoT and next-generation building management systems (BMS) can create sustainable, customer-centric spaces within existing structures.

## BMS at work

South African business and individuals continue to be affected by the country's volatile grid and power provision, and tertiary institutions are no exception. To this end, a local university, faced with the realities of load shedding and its impact on quality of education, decided to negotiate with the municipality to find a mutually beneficial solution.

The municipality's prerequisite: the university had to guarantee it could drastically reduce its power consumption with two hours' notice for the duration of the load shedding period.

The university set to work and implemented a sophisticated BMS system that could assess its power consumption. The system found that by rotating the HVAC system throughout the campus the university would be able to meet the municipality's requirements.

Utilising smart sensor technology, the BMS system determined that by switching off the HVAC systems in allocated areas 45 minutes at a time, it would be able to drastically cut down on power usage.

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This 45-minute window is short enough not to drastically impact the space temperature, which means by the time students and lecturers start feeling some discomfort, the HVAC system is switched on again.

The hospitality industry has been severely impacted by the pandemic and coupled with realities of escalating electricity costs, an office block in Umhlanga, KwaZulu-Natal decided to find a solution to its exorbitant power consumption.

A major contributor to the office block's energy usage was its HVAC system which had to ensure the building stayed cool and comfortable during the hot and humid summer months. Already steps had been taken to support the HVAC systems by making ice at nights and running it through an ice plant system.

Unfortunately, due to the heat from the early morning sunrise over the ocean, the ice supply was depleted by midday and HVAC system had to take over during the peak hours of the day.

Using a BMS system, the office block ascertained that by utilising the HVAC strategically it could save on costs and energy. It was found that by switching on the HVAC system earlier (between 4-5am) and gradually cooling the office block during non-peak times, the ice plant could be used during peak daytime, thus saving on energy and costs.

## Building automation

The abovementioned examples clearly make a case for the importance of BMS in saving costs and energy. Taking this one step further, is the automation of BMSs to optimise buildings. For example, integrated presence detectors can detect whether a room is in use and adjust the heat, ventilation, and lights accordingly.

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Integrating HVAC, lighting, and booking systems also offer opportunities for reducing energy use. It can be as simple as automatically warming conference rooms 10 minutes before meetings, thus extending the lifespan of equipment and cutting on energy usage.

Also, the newest guest room management systems (GRMS) seamlessly integrate with property management systems (PMS)

and the BMS. When a guest arrives, front desk personnel can remotely take the room from energy saving mode to the guest's preferred temperature.

Also, through an integrated and automated BMS and PMS system, staff have access to the do-not-disturb (DND) and make-up-room (MUR) status of rooms. The lights are automatically switched on when housekeeping enters the room (to clean) and switched back to energy saving when they leave. Similarly, the HVAC and lights will switch on and off when guests enter or leave rooms.

The above has led to almost 40% in savings in energy bills in hotels throughout Africa as energy usage is optimised according to guest occupancy.

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