Taking big data steps for improving energy consumption in retail

By Jaco Barnard

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Energy management has become a necessity rather than a choice given South Africa's current power and energy situation, particularly in the retail environment. It has become critical to reduce carbon footprints while adopting sustainable strategies to balance business objectives with environmental responsibilities. Aside from increasing international pressure to adopt greener technologies as part of sustainability initiatives, the cost of energy has become a significant challenge.

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While energy-saving initiatives around lighting, heating, ventilation and cooling can provide assistance, these are often capital-intensive projects that need to be implemented effectively to deliver maximum benefit. In the low margin, high volume retail environment, it has become essential to keep the spiralling cost of energy under control to maximise profitability by optimising operational expenses. This requires data, and more importantly insight into data that can drive actions that will help retailers optimise energy management to curb costs.

Importance of data

For many retailers, problems with power supply can be catastrophic. Without power, cold chain logistics can be compromised and hundreds of thousands of rands worth of perishable stock can be spoiled. In addition, stores themselves cannot operate, losing business and customers. As a result, many retailers have resorted to backup power and alternative energy sources.

However, these initiatives are often costly, particularly if energy consumption is not managed and optimised. In order to manage the cost of energy, both from traditional and alternative power sources, effective energy management is required. This in turn requires data, as without data around metering, measurements and monitoring it is all but impossible to gain the insight required to manage energy consumption. Collecting consumption data is the first step, as this data can then be analysed to deliver the required insights to drive energy saving and improvement initiatives.

By collecting large volumes of data around energy consumption, costs, asset operations and business policies, it is then possible to determine potential operational savings. For example, temperatures can be optimised according to locational and seasonal climate, unnecessary lights and cooling can be switched off when not required, and efficiency of working assets such as refrigerators can be assured.

This data can also be collected over extended periods and analysed to determine long-term trends, energy leakages such as chronic equipment efficiency issues, insulation problems and more. Savings can then be achieved by correcting major issues and fine-tuning operations and controls. There are hundreds of ways that energy consumption can be improved across areas such as lighting, electrical, cooking, air conditioning and refrigeration systems. This means that there are many opportunities for savings, but there is no 'one size fits all' approach. Big data and analytics are the crucial components in effective energy management.

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Making big data work

The first step in improving energy efficiency requires the establishment of savings protocols. Pilot studies should be carried out and savings strategies that can be actioned with data should be determined. The range or significance of savings can then be used to determine the feasibility of rolling these solutions out, based on spend and expected returns.

The second step is to set up data collection mechanisms. The volume and method of data collection depends on the current technology deployed and how granular the data is required to be - for example, monthly invoices on energy consumption will typically not provide enough visibility, so it may be necessary to implement a monitoring solution that provides sample data every half an hour to provide more accurate insight.

Data may be collected via building automation systems, directly through controllers or through management applications. Many legacy and proprietary systems do not allow any access to data, in which case metering and sub-metering analysis must be incorporated. Simply collecting data will not enable retailers to determine savings, so once data has been obtained, it must be analysed in order to provide insight. This is a specialist skill set that may be expensive to maintain in-house, so often it is advisable for retailers to collaborate with an expert service provider.

Given the volume of data, it is also advisable that structured methods and toolsets be put into place across all sites for analytical purposes, another area where an expert provider can assist. The final step is action, as savings will not result from insight alone. Volume is also essential, and retailers need to action initiatives based on insight across all or most of their sites to produce meaningful savings.

Beyond energy

Big data can be harnessed for more than just energy efficiency, and has the potential to deliver significant additional advantages in the retail space. For example, the customer experience can be improved by collecting data from various channels and using it to improve in-store temperatures for comfort, or by utilising online channels and sensor data to tailor the shopping experience.

Store layouts can be improved, footfall can be increased and more. In addition, analytics can be leveraged to improve asset maintenance to help bring down maintenance costs and improve asset life. The data from in-store devices, video and wearable technology has the potential to improve sales effectiveness and improve workforce productivity. All of these initiatives will use the same foundation of big data and analytics.

Ultimately big data analytics, whether in the form of energy management or other initiatives, can help retailers to improve

their competitive edge. More efficient operations and reduced costs lead to enhanced profits, as well as improved customer experiences. Data and analytics are the crucial elements to more successful, more efficient and more profitable retail environments.

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