



## eC4 Case Study

### Intelligent Control of Energy Use

## A Prestigious School in the UK Improves its Energy Efficiency

Visualization of electricity demand and monitoring of energy consumption helps implement strategies to eliminate wastage!

### Background

Recent budget cuts in the UK have forced schools and educational institutions to critically analyze their operating costs - in order to ensure optimized utilization of available resources. It is well known that energy costs constitute a significant portion of a school's budget. Research has shown that, with continuous monitoring and intelligent management, energy costs can be brought down significantly. This case study describes the ec4 implementation and the advantage derived by this school.

### Business Challenge

The monthly energy bills received by the school comprised energy consumption data as derived from the energy meters placed in different areas. However, they carried very little information on the potential reason for such consumption. More specifically, their year to year electricity consumption had been increasing by 8.4% and the school management wanted to understand the reasons for this escalation. Therefore, the school was looking for an energy monitoring solution that could provide an in-depth understanding of their energy consumption and at the same time identify root causes for unexpected energy leakage. The mandate in this case was to use such discovered intelligence from the proposed solution to proactively stop the escalation of the energy costs BEFORE they were incurred.

### Solution

After thorough analysis of the school's requirements, eC4 was deployed in the school to understand their consumption pattern.

Energy leaks, wastage and associated root causes were identified and strategies to achieve savings were planned, implemented and monitored to ensure realization of savings. Typical savings between 12-20% were realized. The continuous surge in the energy costs were reversed!

The benefits derived by the customer included the following :

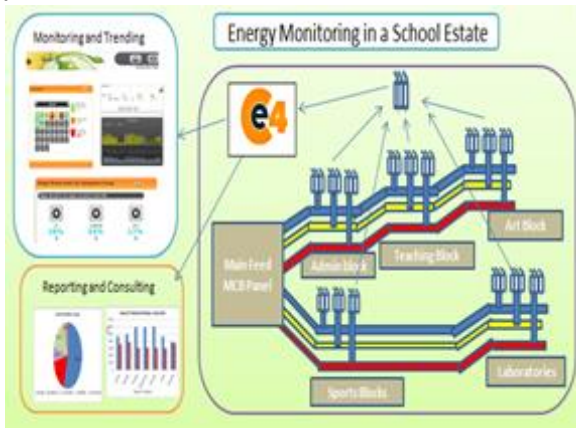
- 1. Sub-metering:** eC4 allowed for the visibility of consumption information at the granular equipment level! This allowed for the understanding of consumption at one or two levels of granularity below the utility generated readings of the existing meters (which served an overall area and therefore could not unequivocally identify the root cause for an escalated usage). Due to this improvement, the school could identify the specific equipment within a facility that was causing energy leakage.
- 2. Baselining :** eC4 could provide baselining of business as usual consumption for different equipment under varying business conditions during weekdays, weekends, holidays, etc., and this led to the identification of anomalies in energy leaks as they occurred!
- 3. Predictive Energy Saving Strategies:** Based on the intelligence discovered from the sub-metering and baselining, energy saving strategies were implemented to eliminate wastage.
- 4. Tracking Strategy Performance:** The performance of strategies was tracked by eC4 to evaluate their impact on energy savings.

## Methodology

The eC4 solution included sensors deployed in various equipment and energy guzzlers within their facility. This enabled the real-time dashboard to provide a fine granular drill down of the consumption within the facility.

A non-intrusive wireless sensor network was used to seamlessly capture energy data. The collected data was used to perform comparative analysis of the readings of previous months and compute the average trend for each location.

Based on the monitored trends, appropriate strategies were implemented for the various equipment loads, such as, the Lighting System, Projector system in classroom, Ventilation system, Boilers, Battery Charging Units for Laptops, Tablets, etc. These loads were mapped to the locations such as the Swimming Pool, Teaching Block, Recreation Center, etc., and therefore allowed the realization of a specific mandate to reduce energy in a particular location.



## Impact

The eC4 engagement helped the school achieve a deeper understanding of its consumption (where, why, when), identify potential leakage and their root causes, and devise, implement and realize significant energy savings. Apart from identifying numerous operational improvements, eC4 also helped in tracing and identifying sources of energy wastage.

**Swimming Pool:** eC4 identified and rectified spikes in the swimming pool during the night time, which was due to the poor condition of certain equipment. This resulted in an overall saving of 12%.

**Load imbalances:** eC4 also identified sharp unbalanced loads in the Teaching Block which were causing heavy energy losses, internal heating and posed a high risk of potential equipment damage. These observations, along with the calculation of the losses, helped the school electricians justify the need for prevention of such losses via routine Preventive Maintenance. Correcting the imbalances resulted in a 20% reduction in energy consumption.

By adopting the eC4 solution, it was possible for the school management to take an evidence based approach to understand energy consumption and identify strategies to realize savings.

## About eC4

Energy costs constitute a high proportion of the overall operational costs of a facility. It is critical to understand the extent and the sources of energy “leaks” and take steps to minimize them. Energy leaks occur all the time due to operational inefficiencies, equipment inefficiencies and process inefficiencies. eC4 identifies such leaks in large facilities. By connecting to different pieces of critical equipment or meters in your facility, eC4 “looks for” opportunistic reduction of energy leaks in real time.

### Canada

5G Energy Limited

203 Colonnade Road, Suite 202  
Ottawa, Ontario K2E 7K3.

T: +1 613 368 4809  
E: info@5genergy.ca  
www.5genergy.ca

### India

Fifth Generation Technologies  
India (P) Ltd.

TS 140, Block 2 & 9, Fourth Floor  
Elnet Software City, Rajiv Gandhi Salai  
Taramani, Chennai 600 113.

T: +91-44-2254 1771 / 72 / 73

### UK

5G Technologies Europe Limited

e-volve Business Centre, Cygnet Way  
Rainton Bridge South Business Park  
Houghton Le Spring  
Tyne & Wear, DH4 5QY.

T: +44-191 3055174

