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CASESTUDY

Enterprise Ireland
Payback on Investment within 12 Months

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"Within 12 months of installation, the ABB Cylon® Active Energy service enabled us to make sustainable energy savings while maintaining occupant comfort. We have recouped our original investment in the project and continue to make on-going annual savings." Fran McGrory, Facilities Manager, Enterprise Ireland

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01 Enterprise Ireland head office

Enterprise Ireland head office is set across 3 blocks totalling 15,200 sq. metres and is located at East Point business park in Dublin's North docklands. As a government agency, Enterprise Ireland is committed to the improvement of energy efficiency of 33% by 2020.

ABB Cylon® Active Energy Solution
In 2010, the gas and electricity meters for the enterprise offices were connected to the ABB Cylon® Active Energy Manager. Using the Active Energy tool, a key anomaly was identified:

• Using the spectral analysis tool, it was clearly identified that there was as high base load energy consumption outside of core operating hours. On questioning it emerged that there was no reason for this high baseload and on further investigation it emerged that there was an issue with the integration between theABB Cylon® BMS interface and the VRV air conditioning system resulting in the air conditioning operating 24/7.
• Using the Cylon BEMS, the suspected integration anomaly was corrected on a single floor and using the spectral analysis, the energy engineer was able to validate the correction and implement it on the second floor.

• By setting a target based on before the correction using the Configure Target in the Analysis section, the energy engineer was able to calculate the savings achieved as a result of the correction.
• By using the alarms tool, the energy engineer is able to be alerted should the energy profile for the building deviate from the revised target consumption going forward indicating building drift.

Project Summary
Enterprise Ireland experienced significant reduction in energy usage resulting in the following savings between 2011 and 2014

• Electrical Savings: 14%
• Natural Gas Savings: 48%
• Co2 savings: Circa 1M KgCo$_2$ since 2011
• Payback on Investment: 12 Months
• Applications: Active Energy Manager
• Type of Building: Office Buildings across 3 blocks
• Size of Building: 15,200 m^2

Savings Since 2011
Over 1.1m Kwhrs of electricity saved Over 65k m^3 of gas saved

The identification, correction and ongoing monitoring of this error using the Active Energy and ABB Cylon® BEMS tools resulted in a significant energy cost saving to the customer.

The energy manager also uses the Analysis tool in Active Energy to track energy saving projects such as the installation of CO_2 room sensors to control the AHU extract fans on each floor and the turn off of central printing stations out of hours.

The installation of Active Energy grew beyond the initial office into the regional offices and there are now 8 offices, Headquarters and 7 regional offices and 91 data logs connected to Active Energy across Ireland, including gas, electricity, water meters, sensors e.g. temperature and CO_2 and hours run .

Spectral Analysis View | January 2011
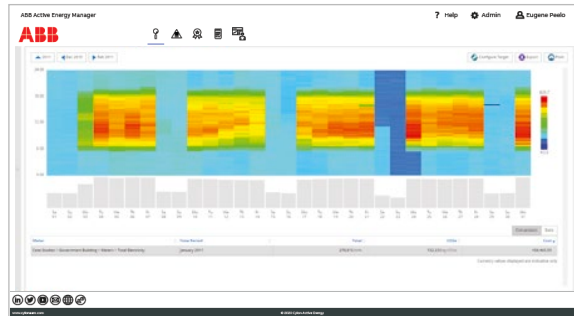
Colour block indicates energy consumption during working hours. Dark blue indicates what the out of hours or base load energy consumption should be which was part of a test completed by Enterprise Ireland to highlight that their base load was too high as indicated by the light blue.

The energy meters in each block were connected to the ABB Cylon® Active Energy Manager service. With the information gathered by the Active Energy Manager tool, the ABB Cylon® team and the onsite facilities team were then able to optimise the operation of the building whilst improving and maintaining occupancy comfort levels.

Energy saving initiatives were identified on Active Energy Manager and undertaken in the following areas:-

Appropriate Location of Temperature Sensors
- Relocating outside temperature sensors to the north facing wall of the building to give more accurate data to the Building Management System.
- Switching off gas boilers and associated heating pumps when the outside air temperature is above 15DegC.

Spectral Analysis View | April 2011
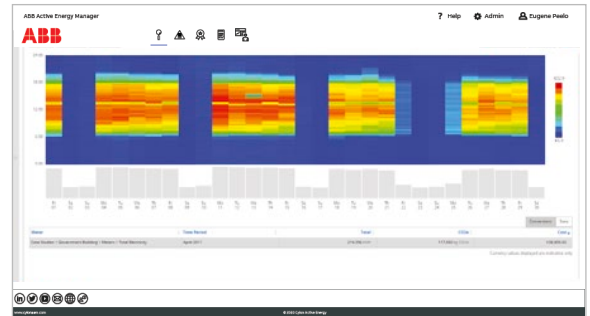
This is the profile of the building for the month after the correction of the integration issue between the BMS and the VRV air conditioning system.

- **Air Conditioning Adjustments**
  Reduction in the AHU run time by 50% through the installation of CO_2 room sensors on the 4 floors in block A. This allowed the fresh air and extract AHU for each floor to be switched off when the CO_2 level is below a certain threshold.
- Correction of integration between the BMS interface and the VRV air conditioning system resulting in the air conditioning only operating as required
- Increasing the communication room air conditioning temperature set point
- Using the light switch to enable/disable the air conditioning for the meeting rooms

Building Management System
- House-keeping: programming holidays on the BMS and eliminating unnecessary energy consumption
- Using the BMS interface to the VRV air conditioning system to increase the dead band between heating and cooling set points.

Overspend Cusum feature | Jan 2012 to Dec 2014
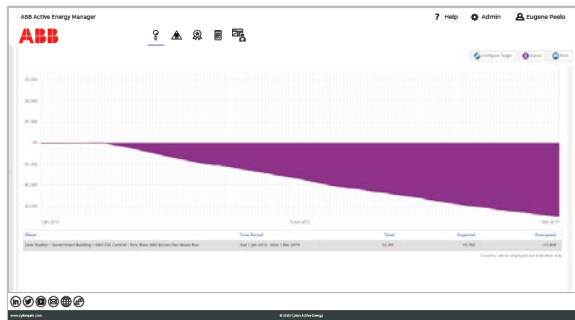
Represents the sum of the daily savings or total savings achieved over the period from the installation of the CO_2 sensors to control the AHU Extract fans. A total of €3.5k was saved for this meter over the two year period.

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Definition: Spectral Analysis feature automatically applies colour for every 15/30 minute interval over the period shown in the graph. Red is the highest and dark blue is the lowest. Each bar is a day ranging from 00:00 to 24:00. An office block should show a pattern of colour during the day with dark blue outside of core operating hours.
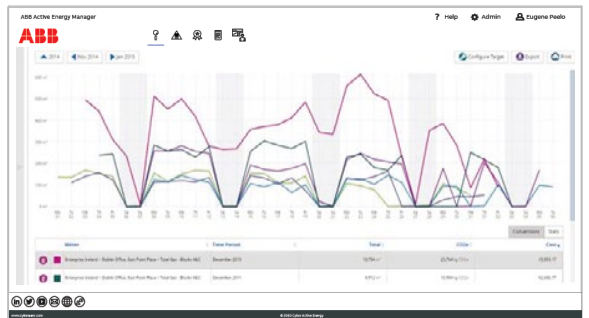
Time Period Comparison View
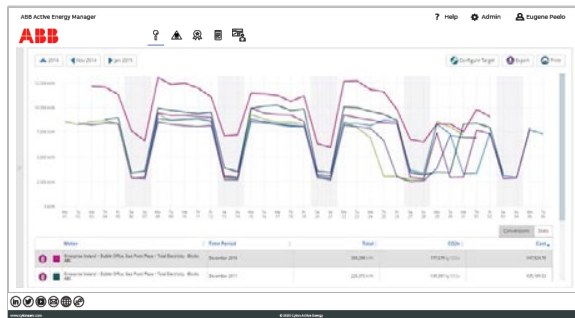
Total Electricity Consumption | Virtual Meter of all Electricity Meters| Month of December compared for 2010, 2011, 2012, 2013, 2014, 2015

Comparison of the same month for 6 years showing a continuous fall in energy consumption year on year. In December 2015, electricity consumption was 36% lower than December 2010

Time Period Comparison View

Total Gas Consumption | Virtual Meter of all Gas Meters| Month of December compared for 2010, 2011, 2012, 2013, 2014, 2015

Comparison of the same month for 6 years showing a continuous fall in energy consumption year on year. In December 2015, gas consumption was 77% lower than December 2010

ABB Cylon® Active Energy Manager Benefits

Continuous Energy Efficiency: The ABB Cylon®
Active Energy Manager tool can provide real time
energy consumption data that allows the facilities
team to monitor energy consumption in the entire
building and take corrective action where
appropriate thus improving energy efficiency
on a continuous basis.

Project Tracking: The ABB Cylon® Active Energy
Manager can also be used to track the performance
of energy saving measures across the buildings,
ensuring the return on investment can be accurately
determined for the various energy reduction
technologies deployed.

Central Monitoring: The Active Energy Manager
solution allows the onsite facilities team to centrally
monitor the energy consumed by individual
buildings in multiple geographical locations
via the user friendly and intuitive interface.

Real Time Monitoring: Even a well-designed energy
efficient building requires continuous monitoring to
prevent building performance drift. The ABB Cylon®
Active Energy Manager solution gathers information
in real time (every 15 minutes) providing energy and
facility management teams with the most up to date
information, allowing them to react to performance
anomalies efficiently and effectively.

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Definition: A Virtual Meter is a
calculated meter in Active Energy
and is used to provide more
meaningful information to the user
e.g. total electricity consumption;
total gas consumption; total
lighting consumption; residual
electricity consumption. A Virtual
meter can be calculated by
addition, subtraction, multiplica-
tion, division or a combination of
the above. A virtual meter is
prepared by the bureau.

Analysis

Smart Building

Charting