CASE STUDY

Driving Decarbonization and Energy Efficiency at Dublin Airport

with ABB Ability™ Building Analyzer

Dublin Airport operates a short and long-haul network out of two terminals, north of the Irish capital. It serves an array of carriers, including a significant long-haul network focused on North America and the Middle East and is managed and operated by daa.

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ABB Ability™ Building Analyzer at Dublin Airport

Capable of handling 15 million passengers per year, Terminal One operates 25 departure gates across its 137,221m^2 site.

Terminal Two, is capable of the same passenger volumes across its 142,007m^2 site that includes a pier with 19 passenger boarding bridges for aircraft. It is home to airlines such as Aer Lingus, Etihad Airways, Emirates Airlines, and the transatlantic carriers operating from the airport like American Airlines and Delta.

ABB SMART BUILDINGS AT DUBLIN AIRPORT

Terminal Two's journey with smart building technology started during its construction in 2010. ABB Cylon® Building Automation and Controls was introduced for comprehensive and efficient energy management. Two years later, the airport authority started to explore its energy operation further by analyzing energy consumption and targeting savings with the addition of ABB Active Energy. In 2017 a new set of requirements, such as the need to pull all the metering data into one place and the ability to deliver different output reports, led to the expansion of the system and the implementation of ABB's newest offering. Currently, ABB Ability™ Building Analyzer, the enhanced, rebranded ABB Active Energy solution, is deployed across the entire airport, including both terminals, campus and airfield buildings.

This has delivered many additional benefits. Indeed, ABB Ability™ Building Analyzer is currently collecting data from 1,600 physical meters from several data sources. **In remote locations, where it was not possible or economical to connect meters physically to data loggers, a wireless metering system now operates.**

BUSINESS USE CASES

Collected data is analyzed and used for an array of business needs such as managing energy consumption for the airport and campus and more.

Managing energy consumption

Energy data is automatically gathered and centralized. Virtual meters are created to analyze energy consumption by business group, to calculate total energy imports and on site generation. Furthermore, the system allows filtering down of data to specific assets to establish trends in the performance.

Reporting on utilities

The system also provides accurate energy costs via the entry of tariffs data for all main utilities. This allows the energy team to provide finance with accurate estimates of energy costs for the month rather that waiting on the utility bill some weeks later.

01 Dublin Airport

Water Management

Water coming from the municipality is locally treated and stored in the airport's reservoir, from where it's distributed throughout the campus. Building Analyzer monitors the water consumption at various points in the network; this allows for significant reductions in consumption and, insight data is used to identify issues such as leaks, where and when they appear.

Sustainability Reporting and Compliance

Using Building Analyzer, daa can provide real time information on energy performance, feeding the required data for the assessment of the energy savings in different projects. The Airport has been ISO50001 certified since 2016. This attests that it embeds energy management into the organization's operations. Virtual meters are used to calculate the energy consumed by significant energy users (SEUs), to facilitate ISO 50001 compliance.

Revenue Assurance

Building Analyzer is used to recharge airport tenants. Once a manual process, revenue recovery is now almost fully automated. The system collects meter data and attributes consumption to the appropriate tenant. Reports detail the consumption and costs per tenant and are imported into the airport's enterprise resource planning (ERP) system for billing. This has increased revenue recovery and decreased the workload of recharging tenants.

Standing Aircraft Energy

Fixed electrical ground power units are monitored in the system to assure that airlines are accurately billed for energy consumed by their aircraft when they are powered from the terminal buildings. Auxiliary power for the airplanes when charging is monitored and verified with Building Analyzer.

Passenger Data

The airport can also now report on key performance indicators such as energy or water consumption per passenger. Data on key indicators such as the number of passenger arrivals and departures, and volume of checked baggage is recorded, and reported using Building Analyzer.

Return on Investment

Building Analyzer can also be used to track the performance of energy saving measures across the airport, ensuring the return on investment can be accurately determined for the various energy reduction technologies deployed.

Energy Projects

Data collected by Building Analyzer is used to evaluate the business case for other energy related projects such as potential lighting upgrades, for example.

A TECHNICAL VIEW

The 1,600 meters connected to Building Analyzer

Monitor different areas like:

- Heating, ventilation, and air conditioning
- Lighting
- Aircraft ground power units
- Airline lounges
- Retail units
- IT rooms & comms
- Lifts & escalators
- Water consumption
- Gas consumption
- Checked baggage and passengers
- Commercial offices
- Car parks
- Hotels
- Substations/Main incomers

Collect data from a variety of data sources:

- Modbus TCP integration to PLCs
- Modbus RTU integration to Modbus electric meters
- Passenger & checked baggage data via CSV data integration
- Substation electrical meter data via SQL integration to a Schneider ION database
- Water meter data via emailed CSV files from a third party provider
- Wireless metering data via emailed data files
- Terminal 2 data via ABB Cylon Building Automation System
- BACnet interface to DELTA Building Automation System in new commercial real estate buildings

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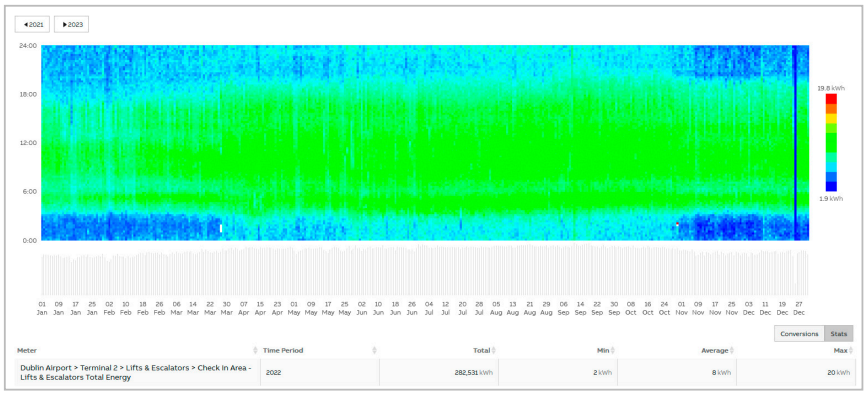
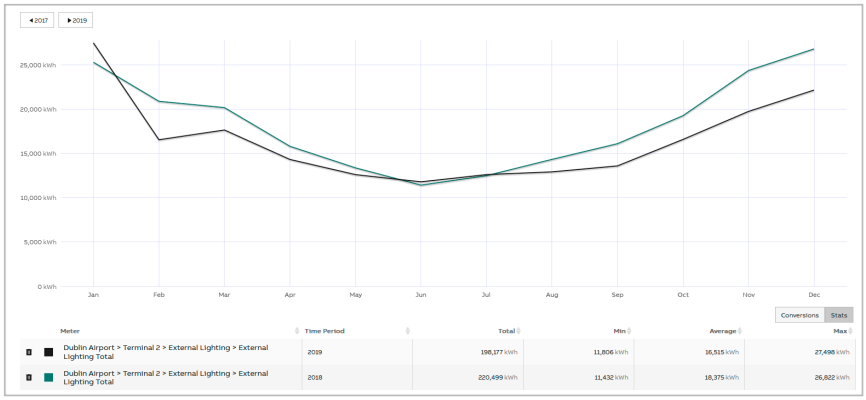
Meaningful examples of the available features

Using the spectral analysis tool, the energy engineers can investigate patterns in energy consumption for each individual meter. When an area is occupied/in operation the profile should be significantly higher than when it is not. The objective is to reduce the base line energy consumption as low as possible.

For example, at some point, when investigating the energy profile of the retail units airside, the team discovered that the base line remained quite high. On investigation it transpired it was due to the lights being left on at night. The team implemented an energy saving measure to automatically turn off the lights at night via the BMS.



Using the time comparison tool, the team can compare the before and after, and calculate the actual savings. Terminal 2 continues to maintain and improve its energy profile (represented by green bars) compared to the base line (represented by black bars) despite the increase in passenger numbers across Dublin Airport.



SOLUTION'S BENEFITS

ABB Ability™ Building Analyzer empowers our customers to reduce energy use in buildings, which accounts for "nearly 40% of total direct and indirect CO_2 emissions globally" (iea, 2020). With our solution customers can get insights into where energy is being wasted and quantify opportunities in terms of energy, carbon, and costs, and reduce consumption and emissions by up to 20% once improvement opportunities are implemented. Building Analyzer also helps maximize the return on existing investment in the BMS, get data granularity and transparency, and leverage that data to decarbonize buildings, increase productivity and comfort.

To find out more:
https://new.abb.com/ability-building-solutions/building-analyzer

ABB ELECTRIFICATION

Electrifying the world in a safe, smart and sustainable way, ABB Electrification is a global technology leader in electrical distribution and management from source to socket. As the world's demand for electricity grows, our 50,000+ employees across 100 countries collaborate with customers and partners to transform how people connect, live and work. We develop innovative products, solutions and digital technologies that enable energy efficiency and a low carbon society across all sectors. By applying global scale with local expertise, we shape and support global trends, deliver excellence for customers and power a sustainable future for society.
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