



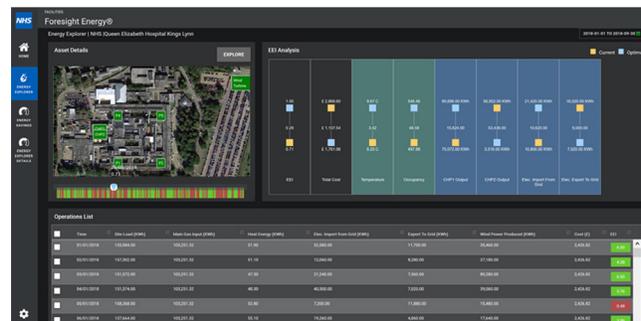
Energy Optimization thru Edge IoT and AI Modeling

Discover how one hospital leveraged IoT data and an AI-infused analytical application to realize annual energy savings of US\$127,460.

Healthcare facilities are among the most energy-intensive buildings in the U.S., consuming close to 10% of total energy used by commercial buildings. American healthcare facilities spend \$8.3 billion on energy every year. As these rising costs strain already tight budgets, many hospitals are seeking ways to cut energy costs without compromising patient care. Optimizing energy consumption through QIO's Foresight Energy, an AI machine-learning solution, can create significant cost savings, as proven by NHS' Queen Elizabeth Hospital Kings Lynn (QEHLK).

CHALLENGE

QEHLK, a 488-bed, 436,500-square-foot hospital in Norfolk, England, has been working with the UK Department of Business, Energy and Industrial Strategy to optimize energy efficiency. Electricity, gas and wind power costs stretched to £971,000 (or US\$1.2 million) in 2018. Using self-generated power from Combined Heat & Power (CHP) units and an on-site wind turbine as well as boilers, the hospital had a total of 32 meters integrated into a Building Management System (BMS). With the ability to both import and export electricity, QEHLK wanted to increase efficiency and decrease their carbon footprint.



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QiO

Founded in 2015, QiO Technologies provides AI-infused analytical applications that predict and prescribe actions to unlock trapped productivity and efficiencies. Laying the foundation for an integrated, affordable, self-managed digital future, QiO Technologies empowers organizations to leverage the emerging world of Industry 4.0 and 5G mobile edge computing.

SOLUTION

QEHKL's energy consumption, occupancy and weather data from the previous year were correlated. Using the QiO Foresight Energy application, the optimal energy consumption for a complex set of conditions was determined, creating a benchmark. IoT devices throughout the hospital captured a wide range of real-time data feeds that factored into current actual energy consumption. Using machine learning algorithms, QiO Foresight Energy compared optimal energy consumption against actual energy consumption; the resulting ratio provided an overall Energy Efficiency Index (EEI) and carbon usage.

QEHKL used the ensuing recommendations, forecasts and actionable insights to optimize energy consumption. Predictions and prescriptions—as detailed as threshold settings for the hospital's heating system—were provided to reduce energy consumption and costs.

BUSINESS OUTCOMES

Prior to solution implementation, analysis of historic data revealed a potential natural gas savings of 6%—£34,000 (or US\$43,336)—in 2018, so QEHKL was optimistic about the potential savings realized during the actual solution implementation in 2019. They were not disappointed. The solution achieved 8% savings—£100,000 (or US\$127,460)—in natural gas costs and a carbon reduction of 180 tonnes (or 198 US tons) in one year. Extending the solution to QEHKL's self-generated energy sources (wind and CHP), provides an estimated additional 17% savings in energy costs equating to £129,000 (or US\$164,423).

This Energy Optimization thru Edge IoT and AI modeling solution is fully scalable, and the NHS organization plans to extend it to other hospitals within its system. By expanding the solution to the network, NHS could potentially realize £30 million (US\$38,238,000) in natural gas savings per year.



QiO Foresight Energy Application Key Differentiators

1. **Multi-tenancy** shortens time to value and improves scalability
2. **Containerization** allows hybrid cloud solutions to be deployed at scale (on the cloud and the edge), resulting in cost savings
3. **Analytical application templates** provide rapidly scalable solutions, reducing the time to value and risk
4. **AI model management framework** provides self-service and data democratization
5. **PARCS™**, an AI-driven framework that focuses on Performance, Availability, Reliability, Capacity and Serviceability, enables real-time benchmarking

WWT Key Differentiators

1. **End-to-end support of IoT strategy** from sensors and device connectivity to analytics and applications
2. **Broad industry and technology expertise** spans idea generation, sensor integration, infrastructure modeling, big data analytics and appdev
3. **Strategic partners with industry leaders**—#1 partner with Cisco, Dell EMC, NetApp, VMware, F5, Intel, Palo Alto, Fortinet, Pure Storage and Infoblox
4. **Unmatched Advanced Technology Center provides access to \$500 million of technology** from 100+ vendors for testing at scale and Global Integration Centers and Supply Chain streamline implementation time and costs
5. **WWT delivers business outcomes** with a unique approach that involves identifying, testing, and planning strategies to accelerate deployment and deliver results