The Francis Crick Institute


The Francis Crick Institute. Photo credit: Francis Crick (www.crick.ac.uk)

The biggest biomedical research facility in Europe, the Francis Crick Institute, generates enough energy (from 810 solar panels on its roof) to run 35 houses each year. While saving 35,000 tonnes of carbon dioxide. This extraordinary commitment to reducing its carbon footprint has earned the Crick an 'excellent' rating from BREEAM - the world's leading sustainability assessment tool.

Kendra Energy Solutions is helping the Crick further reduce its carbon emissions and streamline its carbon reduction reporting. All by installing and maintaining state-of-the-art energy saving technology.

The Francis Crick Institute opened the doors to its iconic central London building in 2016. Boasting 76,000 square metres of floor space and 1,553 rooms - twice as many as Buckingham Palace - it houses more than 100 research groups and 2,000 staff and students. All working to improve the treatment, diagnosis and prevention of human disease.

Scientists at the Francis Crick Institute work on anything from molecules and cells to entire organisms. Therefore, the facility provides workspaces for a whole host of different applications, including four floors of interconnected laboratories.

Each space has unique sustainability and health and safety requirements. To ensure optimal environmental conditions are met, an Intelligent Building Energy Management System (BEMS), equipped with integrated computerised technology, monitors, analyses and controls building assets and services.

Kendra is a trusted partner at the Francis Crick Institute and has been since 2017. With a permanent onsite presence, Kendra engineers keep the facility performing efficiently, while mitigating health and safety risks. This includes monitoring and maintaining 25,000 sensors that constantly measure heat, light, air pressure and humidity. The goal is to keep the building as comfortable, practical and healthy as possible, for all staff and visitors.

Goals

Kendra was tasked with helping the Francis Crick Institute achieve three key goals:

- Upgrade its originally specified BEMS (which had been made obsolete since the building opened) to enable the facility to take advantage of the latest technology and features.
- Improve energy efficiency and carbon reduction reporting.
- Adopt a condition-based maintenance approach, whereby checks are carried out autonomously (rather than manually) to flag faults.

Challenges

The performance of its BEMS is critical to the safe operation of the building. Maintaining optimum conditions in sensitive areas, such as laboratories, requires absolute precision and accuracy - the smallest change could have significant consequences.

EcoStruxure Solution

The Francis Crick Institute's previous BEMS – the Schneider Continuum – is no longer supported by the manufacturer, which meant that the facility couldn't access the latest features and upgrades.

To rectify this, Kendra introduced a robust engineered solution – the Schneider EcoStruxure™. With its cutting edge control technology and IoT-connected software and services, the EcoStruxure provides real-time control and monitoring of systems to deliver faster and more in-depth operational insights.

Kendra started upgrading all 1,500 of the Francis Crick Institute's BEMS units in April 2022. The £3 million project is due for completion in 2025.

"The partnership we at the Crick have formed and developed with Kendra Energy Solutions since 2017 continues to grow in strength year on year. They are a key partner in enabling and helping us achieve our challenging carbon reduction strategy target of reducing our emissions by 50% by 2030 and ultimately net zero carbon by 2040.

The PROActiv Analytics solution we have deployed through Kendra is providing essential real time data for optimising our existing control strategies. It retrieves data from over 500 utility meters, giving us detailed granularity of our energy usage and dashboards that allow us to verify we are tracking our reduction targets. It provides accurate reporting to our senior stakeholders.

I fully value the expertise of Kendra engineers and their commitment to working with the Crick to achieve our sustainability aims and objectives"

Mark Angus, Head of Facility and Infrastructure Technical Systems at the Francis Crick Institute

PROActiv Analytics Solution

Previously, the Francis Crick Institute had a 'scheduled' approach to maintenance – where an engineer would review each BEMS unit individually to check for faults. It was ineffective due to the vast number of units on site - over 1,500 in total. Under this approach, a particular unit might have gone several weeks or months without a check.

Kendra's PROActiv Analytics solution essentially provides a 'virtual engineer' to perform checks on all units 24/7. Covering approximately 3,000 electrical or mechanical items across the site, and collecting data from 25,000 BEMS points, the solution guides maintenance activities to where they are required the most.

By capturing, integrating and analysing vast amounts of data, PROActiv Analytics identifies issues as they occur, eliminating the need for routine checks. This condition-based maintenance approach allows engineers to address actual problems and spend less time targeting plant that is still operating within spec. In turn, the Francis Crick Institute can make better use of its engineering resource.

PROActiv Analytics has also addressed the institute's desire to cut energy usage and improve carbon reduction reporting against targets and budgets. It did this by improving the Francis Crick Institute's pre-existing power monitoring system, which previously only logged meter data and provided basic profiles.

By integrating utility meter data and motor drives into PROActiv Analytics, as well as importing historic data, Kendra can pinpoint causes of excessive energy use and enable in-depth greenhouse gas emissions reporting. Today, a rich interface is read directly from 750 meters across the site. New features, such as customizable charts, roll-ups and baseline comparisons provide a smooth user experience.

Key Results

- Since May 2022, PROActiv Analytics has identified a potential excess energy usage of over 220,000kWh/year. Kendra's intervention has saved the Francis Crick Institute 170,000kWh/year – that's more than 77%.
- PROActiv Analytics has identified issues above and beyond standard BEMS alarming, such as reversed heating/cooling valves, badly tuned loops and units operating at low efficiency.
- The nature of the building requires plant to be running 24/7. However, Kendra's PROActiv Analytics solution identified instances where underfloor heating was running unnecessarily outside of opening hours. As a result, pump run hours were reduced and The Francis Crick Institute made significant savings.
- The Francis Crick Institute receives its energy supply through several sources (grid, local CHP, external CHP, solar PV and generators). By metering each electrical supply and fuel for local generation (gas/oil), Kendra was able to use the greenhouse gas emission functionality within PROActiv Analytics to significantly improve the ease and accuracy of carbon emission reporting. This also enabled the facility to better assess when to use each of the various supplies, based on effectiveness.
- The Schneider EcoStruxure upgrade essentially 'debugged' the Francis Crick Institute's systems. When Kendra switched systems off to check them, it found some weren't operating as they should be and would have remained faulty without intervention. Kendra rectified any issues it found to ensure the plant was fit for purpose.

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