

Decarbonising The Francis Crick Institute

As one of the biggest biomedical research facilities in Europe, the Francis Crick Institute generates enough energy (from 810 solar panels on its roof) to run 35 houses a year. At the same time, it saves more than 50 tonnes of carbon dioxide, demonstrating an extraordinary commitment to decarbonising its facility.

Since opening the doors to its central London building in 2016, the Crick has become an iconic landmark. 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 diagnosis, treatment and prevention of human disease.

Energy management

Used for various applications, workspaces at the Crick - including four floors of laboratories - require unique environmental and safety conditions. To meet these conditions, a building energy management system (BMS), with integrated computerised technology, monitors, analyses and controls equipment and services.

Kendra came onboard in 2017 to install and manage the Crick's smart energy management systems and since then, it's become a trusted partner. With a permanent onsite presence, Kendra engineers have expanded the Crick's energy management capabilities and helped to significantly improve energy efficiency. For instance, in just two years, Kendra's PROActiv Analytics platform has identified inefficiencies and helped reduce the Crick's total carbon emissions by 21%.

Hitting targets

Kendra helped the Crick meet - or work towards - numerous energy management goals, such as:

- Upgrade/modernise the BMS
- Reduce carbon emissions 50% by 2030 and become net zero carbon by 2040
- Adopt a targeted approach to maintenance
- Automate the reporting process for critical space conditions
- Create a suite of reports to track live energy usage against targets
- Integrate smart energy systems with the Crick's Planon CAFM system to improve reactive work order management
- Extract data into Power BI dashboard software to create public displays of energy usage



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



What is PROActiv Analytics?

PROActiv Analytics integrates with your BMS to streamline performance reporting and broaden energy management capabilities. While your BMS tells you if something *hasn't* been achieved, PROActiv Analytics goes one step further and tells you *why*, offering effective solutions with little to no human intervention.

A 'virtual engineer' with a bird's eye view of your estate, PROActiv Analytics can integrate with most protocols and absorb huge amounts of granular data. It then processes, interrogates and makes sense of this data, so it can:

- Spot energy use patterns and saving opportunities
- Advise new approaches
- Create tasks and assign actions
- Track progress
- Generate actionable reports
- Create 'smart service' plans that flag issues and rank them based on business impact, using various criteria (e.g. cost or maintenance urgency)

Its ability to learn and predict future events make it a truly intelligent piece of software. Using bespoke Kendra programming rules and a 24-hour support package, PROActiv Analytics is a game-changer for businesses looking to cut carbon emissions.

Last year, it saved Kendra's clients 3,635 MWh. The equivalent of 330 homes, powered 24 hours a day for five months straight.



Results

Energy management and carbon reduction

Shown to save a minimum of 20% when it comes to HVAC spend, PROActiv Analytics is guaranteed to get results. Most clients save considerably more and have even racked up savings of over 38% per annum. Ideal for a sustainability-focused client like the Crick.

By utilising PROActiv Analytics data, the Crick reduced total carbon emissions by 21% in just two years – and this is above and beyond any savings from upgrading the BMS. The Crick is now firmly on track to hit its 50% carbon reduction target by 2030.

Resolving issues identified by PROActiv Analytics alone has saved the Crick around 537,000 kWh (109 tons CO₂e) in total. This total can be split out across two years. In 2022 (from June onwards), PROActiv Analytics racked up savings of 105,000 kWh (20 tons CO₂e). The following year, in 2023, PROActiv Analytics identified total savings of 432,000 kWh (89 tons CO₂e).

We expect energy savings to continue to steadily rise over the coming years – and to hit yet more energy efficiency milestones along the way.

Improved reporting and display analytics

Installing PROActiv Analytics has resulted in a smarter, better connected building. Utilising the Internet of Things (IOT) and widening the Crick's data integration capabilities resulted in a much-improved power monitoring system, which previously only logged meter data on basic profiles.

As a result, the Crick's reporting and data display capabilities have become slicker. Kendra used the greenhouse gas emission functionality within PROActiv Analytics (after metering various electrical supplies and fuel for local generation) to improve the ease and accuracy of carbon emission reporting. The facility is now able to assess when to use each of its energy supplies based on effectiveness.

Today, a rich interface is read directly from 750 meters across the site. New features, such as customisable charts, roll-ups and baseline comparisons provide a smooth user experience.

Maintenance: Schneider EcoStruxure

The first step to streamlining the Crick's energy management capabilities was a BMS revamp. Starting in 2021 Kendra began upgrading 1,500 originally specified BMS controllers (which had been made obsolete) to Schneider EcoStruxure. With IoT-connected software and fast, real-time control and monitoring, Kendra was confident EcoStruxure would fulfil the Crick's desire for an innovative BMS system.

The EcoStruxure upgrade essentially 'debugged' the Crick's systems because when Kendra upgraded the controllers, it found some weren't operating as they should be. This allowed Kendra to rectify faults as and when they were found.

Maintenance: PROActiv Analytics

In 2022, PROActiv Analytics was installed. A move that transformed the Crick's approach to maintenance by making it targeted and precise. Through advanced analytics, the Crick got a full picture of its building's energy performance. Faults are now spotted as they occur or predicted ahead of time and prevented altogether.

Covering 3,000 electrical or mechanical items and collecting data from 25,000 BMS points, maintenance activities are guided to where they're needed most. Freeing up time and resources so engineers can use their time effectively.

This has led to better operational efficiency and noticeable improvements in the condition of the HVAC plant and equipment. PROActiv Analytics identified issues above and beyond standard BMS alarming. Like reversed heating/cooling valves, badly tuned control loops and instances where the plant was operating at low efficiency. It even found that underfloor heating was running unnecessarily outside opening hours, resulting in reduced pump running hours.

What the Crick had to say

"Kendra's been a valued partner to the Crick for many years. Its experience and implementation of numerous energy reduction initiatives have significantly helped us attain our ambitions.

The PROActiv Analytics solution we deployed through Kendra plays a crucial role in helping us achieve our challenging carbon reduction strategy target: to reduce emissions by 50% by 2030 and ultimately net zero carbon by 2040.

Kendra's expertise, insights and contributions are valuable and appreciated. PROActiv Analytics has helped us drastically improve our energy efficiency and reduced our carbon emissions by an impressive 21% over a two-year period. It provides essential real time data for optimising our existing control strategies and retrieves data from over 500 utility meters, giving us detailed granularity of our energy usage and dashboards. As a result, we can verify that we're tracking our reduction targets and provide accurate reporting to senior stakeholders.

The partnership we at the Crick have formed and developed with Kendra since 2017 continues to grow in strength year on year. 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 Facilities and Infrastructure Technical Systems