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Linklaters' Approach to Energy Management Strategy

Linklaters aims to be the leading global law firm, building relationships with top companies and financial institutions who turn to us for support on their most important and challenging assignments. As part of our commitment to being a responsible business, we launched our award-winning Collective Responsibility strategy with the aim of embedding corporate responsibility in all that we do. This was further reinforced when we became signatories to the United Nations Global Compact, committing to integrating the 10 principles into our strategy, culture and day-to-day operations as a firm – a commitment which extends to how we manage our impact on the environment.

With 29 offices in 20 countries around the world, we achieved global corporate certification to ISO 14001 in 2012 and became a carbon neutral business in 2017. Like most professional services firms, energy use is one of the firm's most significant contributions to climate change – the difference is that we

now use 51% less energy in absolute kWh terms compared to 10 years ago. A significant majority of this reduction has been achieved at our One Silk Street office, an achievement which was recognised externally when we won a Gold award in the Mayor of London Business Energy Challenge.

Occupied by Linklaters in 1997, the 61,000 m² building is home to over half of our people. Operating 24 hours a day, 365 days per year, we are responsible for the full management and maintenance of the building, meaning we are firmly in the driving seat when procuring and managing our energy – we have sourced a 100% REGO backed tariff for all UK office electricity since 2007.

What does energy management mean at One Silk Street?

The goal has always been a simple one – to reduce energy use, without impacting on the working environment of our people.

In the early days, the focus was getting our house in order

establishing an agreed operating baseline. In essence, this was a building-wide exercise of turning things off, turning things down and not switching things on in the first place. These simple steps provided us with overnight energy reductions with minimal effort and expense. However, having set a long-term 60% reduction target, the decision was taken to overhaul the on-site Mechanical and Electrical (M&E) maintenance strategy.

With the full support and mandate of our senior management team to designate energy performance as an operational priority, we set about finding a service provider who understood our goals and was willing to partner with us to deliver them. The outcome was the development of an "Energy Focused Maintenance" strategy. Shifting away from a solely Planned Preventative Maintenance (PPM) approach, the new strategy embedded energy management into the day-to-day roles of the on-site engineers, whilst ensuring we continued to maintain our M&E services effectively.

Energy Focused Maintenance

Linklaters' Energy Focused Maintenance strategy is founded on five core principles:

Keeping the lights on PPM is still a core element of daily maintenance activities. However, in order to free up the engineers' time to focus on energy-saving projects, we reviewed and revised the entire PPM schedule.

Splitting assets into two core categories, critical and non-critical, we looked for opportunities to reduce the PPM job list. Critical assets, i.e. lifts, fire alarms, risers, UPSs etc., continue to receive the full PPM service. Non-critical assets (primarily those systems

with a redundancy) were moved to a validation-based programme, blending elements from PPM and condition-based maintenance.

For example: rather than physically servicing the multitude of pumps in the building every three months, thermal imaging and air and water commissioning tools are employed to take key operational measurements. If these measurements fall between agreed tolerances, and no hot spots are identified on the thermal, then the engineers are trusted to use their professional experience to decide if a physical service is required. If not, it waits until the full annual service (which is non-negotiable) takes place.

Annual recommissioning To keep our operating baseline in check, we have employed an annual and

seasonal recommissioning schedule. Focusing on the heating systems in the summer and the cooling systems in the winter, this "whole system" approach improves fault finding and optimisation opportunities.

Set points, flow rates, dead bands, point-to-point testing, sensor calibrations, time schedules, customisation resets etc. are systematically reviewed and revised back to agreed criteria – reining in the operational drift that inevitably creeps in over time. We have also increasingly spent time and effort to reduce the operational vs. design gap. Design figures and criteria are often significantly overstated and tend to err on the side of caution, working to operational extremes rather than business as usual conditions, leading to energy waste and underutilised plant.

Capital investment

This point is perhaps an obvious one, but spending money on more efficient equipment and technology should be at the foundation of any credible energy management plan. Our investment decisions follow a five year payback principle, which

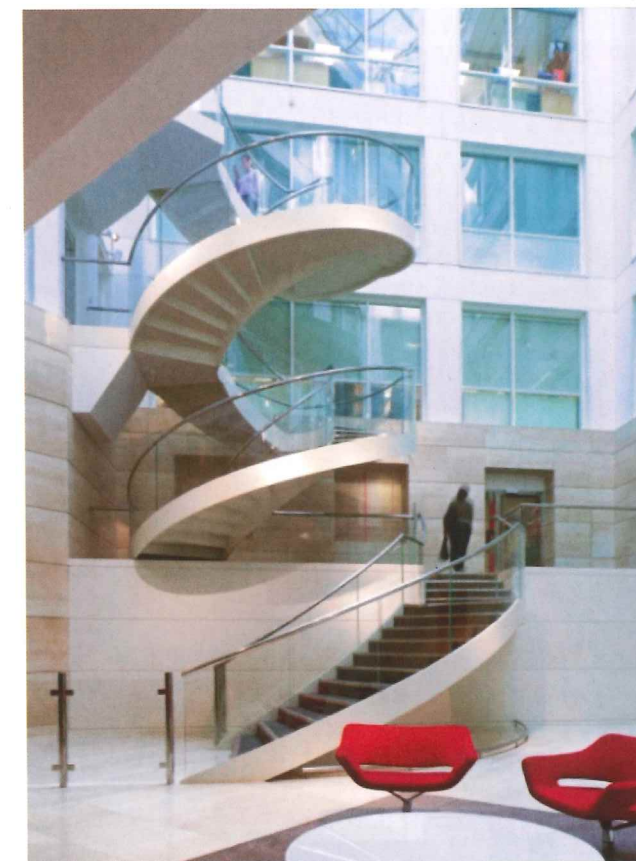
opens up a greater breadth of opportunities for improvement.

When investing in new technology, the procurement rationale of course takes into consideration energy efficiency improvements, but this is balanced against other business needs i.e. ongoing maintenance requirements, system resilience, integration capabilities and industry reputation are all taken into account before a final decision is made. Over the years, we have progressively upgraded and replaced most energy hungry HVAC plant and lighting with more efficient alternatives. We have installed a comprehensive, but tactically positioned, suite of sub-meters across the main plant and office spaces, and we regularly invest in developing and updating the Building Management System (BMS).

Optimisation and monitoring

Some of our biggest savings have been realised through effective monitoring and optimisation. We have integrated lighting and HVAC systems via the BMS to manage individual offices, open plan spaces, lift lobbies, corridors and circulation spaces to work to a custom-designed and predetermined control strategy. Air conditioning, lighting, temperature dead bands and operating times are individually managed and co-ordinated by the thousands of PIRs installed throughout the building based upon presence or absence status. Minimal occupant input is required, limited to $\pm 2^{\circ}\text{C}$ per thermostatic control unit. Further changes can be made, but these must be approved by a senior engineering manager prior to implementation.

This degree of automation ultimately provides a more consistent and predictable demand on the central plant, and this becomes particularly relevant outside of core working hours when building occupation can be sporadic and widely dispersed. Effective



energy management during these off-peak twilight hours is where we have realised a significant percentage of our savings.

In turn, this predictable demand has afforded us a variety of additional optimisation opportunities. Occupancy-led free cooling and AHU operation, boiler dry cycling prevention, system set point changes, staged plant shutdowns and lighting control strategies have all been tweaked and refined year on year.

It goes without saying that all of the above changes really are only possible when you have the right tools, monitoring and reporting capabilities at your disposal. Sub-metering and BMS data have been instrumental in providing a helicopter view of how the building reacts and responds to the demands we place on it. We also regularly review qualitative data in the form of occupant change requests or complaints to make sure any changes we are making are not negatively impacting on the comfort of our people.

To make sure all of the data available at our fingertips is a help, rather than a hindrance, a significant amount of planning and time has been spent rationalising, organising and benchmarking data into key metrics that provide simple snapshot performance reports for key areas and systems within the building. The ability to deep-dive to the individual system or asset level is available, but this, for now, is reserved for specific tasks and projects.

Project pilots, training and collaboration

So, what has made all of this possible? That's our people, specifically a dedicated team of on-site M&E engineers who have embraced this new way of working.

They have been responsible for generating, planning and delivering many of the initiatives I have spoken about above.

Ideas are generated by the team in a series of regular meetings and engagement sessions attended by everyone, including the management team. No idea is too small and, as a business, we actively encourage experimentation. A small pot of money is set aside from the maintenance budget each year to



fund trials and pilots – with the ultimate aim of establishing a proof of concept (or not, as the case may be!). If a project is viable and meets the five year payback principle, then its full implementation goes ahead. My role is to support the engineering team in analysing and interpreting the data, and to develop their business cases for investment.

To upskill the engineers, Linklaters invests directly in their training and development. For us, this simply makes financial sense. Having on-site expertise for BMS, lighting controls, inverters and sub-metering for example, keeps down contractor costs – and in turn the engineering team become better fixers and problem solvers, whilst simultaneously introducing variety to their daily roles.

What have been the most challenging aspects of implementing this new approach?

Making an idea a reality comes with the usual challenges and is

quite rightly a significant change management piece in itself. It took a solid three years to implement all of the key elements that I have spoken about, and we have continued to improve and modify the approach we've taken in the years since.

Medium to long-term planning and stability are essential. By signing up to a five year contact term with our service provider, both parties have been committed to its success. Beyond that, two way

communication, mutually agreed goals and milestones, straight talking and clearly defined roles and responsibilities have all helped to deliver the original vision.

On a more practical level, one of the biggest barriers we have encountered has been the lack of readily available

bite-sized training materials geared towards M&E engineers in the energy efficiency space. This has at times hindered the pace and progress of projects or has required the services of external support and guidance.

Looking ahead, we are now investigating the potential benefits of implementing a real time monitoring, alarm and response solution – getting smarter with data is the natural next step and will become increasingly important as the opportunities to further reduce energy use becomes increasingly difficult to achieve.

Author's profile:

Lee Collier, Senior Energy & Environment Advisor is an environmental scientist with ISO 14001:2015 Lead Auditor, Energy Manager and Price 2 Project Management qualifications. With over 6 years experience in the professional services sector, Lee is responsible for Linklaters' UK environmental sustainability programme and global greenhouse gas accounting and reporting.