<sup>by</sup> CHARLES COE Energy Hub Manager at Mace Group



# Construction: an interview with the Mace Group

In this regular feature, we focus on how organisations across different industries approach energy management. In this issue, we are exploring the world of the construction industry with Charles Coe, the Energy Hub Manager at Mace Group.

Mace is an international consultancy and construction company, founded and built on exceptional people, a commitment to service excellence and a deep-rooted entrepreneurial spirit.

We employ over 5,000 people across five global hubs, with a turnover of £1.97bn. We develop, consult, construct and operate some of the world's most inspiring projects and programmes.

In the past, these have included the delivery of the Queen Elizabeth

Olympic Park, the Shard and the landmark Tate Modern Extension. Current projects include the Battersea Power Station, Dubai Expo 2020 and the new piers and terminal at Amsterdam's Schiphol Airport.

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> Last year Mace directly procured over 25 GWh of energy. This is what is required to keep our operations live and ensure that we deliver projects on time. The Energy Hub was established in 2013 after an audit across the business revealed

that energy was not being procured centrally and that projects were paying a difference of up to 20 pence per unit for their energy. Now in its fifth year the Energy Hub is responsible for procuring and managing energy across the entire

UK business. By being smart in our approach, the Energy Hub is saving the business £2m year-on-year and has established energy management right at the heart of the strategic agenda for utilities management.

#### What does energy management mean at Mace Group?

Mace was founded on the core principle of 'a better way' and this is the same approach we take when managing our energy. For us, energy management means that we must innovate and add value. It means that we must do the right thing and

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lead the way by driving best practice. It means that we must educate and collaborate with other teams to deliver inspiring projects safely. Essentially it means that we must take a hands-on approach and get involved.

In terms of corporate activities, this summer we started a journey aimed at reducing energy consumption and improving staff comfort at our head office in central London. With 8.000m2 floor space and over 800 staff, the office represents a significant amount of our fixed asset energy consumption. It also represents the largest opportunity for savings. The journey began with the installation of an intelligent software programme that collects data from the building management system (BMS) and visualises plant operation throughout the entire building. The

impact of this was immediate as we identified and corrected major plant that was operating against the BMS scheduling and running outside of office hours. We have also outlined an ongoing programme of works that will continue to focus on reducing energy consumption throughout the building whilst introducing the added benefits of: grid and energised we collaborate with the site teams to manage their permanent metering arrangements. With any one of our developments containing hundreds of residential units - each one requiring an electric utility meter as a minimum - it is crucial that meter installations go ahead as planned so not to impact the overall construction programme. To achieve this we maintain a close, progressive relationship with our energy supplier, who engages with the meter operators directly. Acting as the liaison between site, supplier and meter operator we ensure that site surveys are conducted so that all stakeholders are clear on their requirements in good time. The next priority is to schedule the programme of works with the site team and address any potential risks appropriately. Then once the operatives are on site, we ensure that progress reports are regularly communicated to measure how the meter install is being delivered and determine if any additional resource is required.

# How does Mace Group deal with energy management?

Under guidance from the Department for Business, Energy and Industrial Strategy, businesses with electricity costs below 20% of gross earnings are not considered as energy intensive. Under these guidelines it is unlikely that the construction industry will ever be considered as energy intensive, which is understandable when comparing energy costs to the overall project value. The cost of energy is dwarfed compared to costs for labour and materials. However, if you analyse energy consumption against staff count then construction becomes an energy intensive industry indeed. For example, the unit of energy consumption per employee at Mace is 7,225 kWh per year. Comparing this to data from the International Partnership for Energy Efficiency Co-operation\*, the unit of electricity consumption per employee for the UK service sector is just 4,373 kWh.

Either way this does not mean that energy is any less important to the industry; quite the contrary. We just work with it in a different way. As builders and developers, we have very specific requirements in the way we buy, consume and manage energy.

# Buy

A high proportion of our energy is procured through temporary building supply (TBS) contracts for construction projects. At bid stage I engage with the bidding and construction teams to profile energy consumption and determine the expected site load. This involves documenting each piece of equipment's power loading and scheduling it against the construction programme. This has two benefits: 1) reduces risk factor for

Improved employee comfort through reduced hot/ cold call requests, and Increased plant longevity by reviewing the planned preventative maintenance strategy.

From an operations perspective, once our projects are connected to the



the supplier when determining the unit rate for power, and 2) provides expected peak load (in kVA) for the Utilities Management team so they can make their application to the District Network Operator (DNO) for a new TBS connection.

We also engage permanent supplies. Residential, commercial, landlords, gas and water connections are all procured through the Energy Hub. These are typically procured on short-term supply agreements prior to arranging a change of tenancy into the client's name once the project has achieved practical completion. This is a critical aspect of our work as there is the added risk of commercial disputes arising from supplies being handed over incorrectly. We mitigate this by working to an established methodology agreed with the client.

#### Consume

True to our corporate social responsibility values, Mace consumes electricity from 100% renewable sources. Every electrical supply in Mace's name, whether it is a new connection or existing supply, will be on a renewable tariff. This is mandated across the business and is a non-negotiable.

#### Manage

In construction, programme is king so we must manage energy strategically. Our key priority is to ensure that the sites have got the



power they need when they need it. Simultaneously, any savings that we can achieve have a positive impact on the bottom line. The approach that we take is to sub-meter larger sites and report minute by minute data back to a central energy management platform. By working closely with the Sustainability team we analyse the data and identify the available savings whilst not affecting the construction programme. The majority of our work focuses on the accommodation areas and we have achieved some fantastic results. For instance, 35,000 kWh - equivalent to 4.1 tCO2 – was saved when we changed existing fluorescent bulbs to LED throughout the site and welfare lighting.

### What areas of every day business at Mace Group are most challenging in terms of energy management?

Construction is a very temporary industry by nature. Typically, our construction teams will mobilise on site, work on the project for no more than three years, then handover to the client and vacate. This results in a high churn of energy accounts with supplies regularly being connected, disconnected or transferred to the client through a change of tenancy. Over a nationwide portfolio spanning hundreds of projects, managing this flow of work becomes a challenge. Specific knowledge and ongoing management is required to keep on top of it all. We achieve this by centralising all accounts through the Energy Hub so we know exactly where we stand with any of our accounts at any given time.

As construction managers we are the product of our supply chain and this presents a number of challenges when it comes to energy management. Utility meter installations, especially on larger projects, require a lot of resource from meter operators. We cannot

> directly employ them nor can we have direct insight into other projects they have in the pipeline. Added to this, permanent meter installations typically occur toward the final stages of a project; when the pressure is on to achieve practical





completion and handover to the client. This means that the risks are higher when arranging installs, especially if it is a particularly busy period for the meter operator. Being fully transparent in our requirements and engaging with the project team in the earlier stages of the project reduces this risk. This way we can assist with the operators timetabling

as they are better equipped to schedule their internal work programmes.

Ongoing management of site sub-metering is another challenge to overcome. Construction sites are always to the south-east corner, or even removed from site altogether, mid-way through the project. This can leave your sub-meters monitoring a dead supply. Or worse still, monitoring the wrong supply. This results in the sub-meter being wasted. The impact is that it can manipulate the data you are collecting as the consumption you

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changing and developing. For instance, that tower crane that was initially installed in the north-west corner of the site can be relocated thought you were measuring (for said tower crane) is now skewed. On top of this, aspects of your site will be left un-monitored. This is best mitigated by developing a sub-metering strategy that addresses the challenge and outlines the process for

relocating meter hardware in line with equipment moving around the site. It is a continuous process.

## **Author's Profile:**

With the desire of contributing towards the low carbon economy, Charles has been working within the energy management industry since graduating with a Masters in Sustainable Energy and Environment from Cardiff University in 2011. Charles has spent the majority of his career to date as a Low Carbon Consultant, providing clients with advanced energy management applications. Now with Mace, Charles is working on projects that shape the skyline and build sustainable communities.

\*International Partnership for Energy Efficiency Co-operation, http://g20-energyefficiency.enerdata.net/indicators/ unit-electricity-consumption-of-servicesper-employee.html#unit-electricityconsumption-of-services-per-employee.html

