



CARBON BITES

From the CIBSE ENERGY PERFORMANCE GROUP

Taking Commercial Offices to Net Zero Carbon

What are the Challenges in Getting Commercial Offices to Net Zero Carbon?

Transitioning the UK to a Net Zero economy requires substantial increase in renewable energy plus drastic reductions in energy use. The London Energy Transformation Initiative (LETI) and the UK Green Building Council (UKGBC) have identified a target of 55 kWh/m² GIA/yr (70 kWh/m² NIA/yr) as the 'Whole Building' energy use intensity target for offices. Design for Performance (TM54 Plus) modelling was undertaken to develop the commercial Net Zero Carbon archetype detailed in LETI's Climate Emergency Design Guide. It identified one pathway to reimagine commercial office buildings to achieve Net Zero. Mixed-mode heating, ventilation, and air conditioning (HVAC), relaxed cooling setpoints, reduced tenant loads, and reduced landlord ancillary energy are key strategies.

The Role of Data as we Drive Towards Net Zero Carbon

Good building energy and operational data is a crucial part of our drive towards net zero carbon because it allows us to:

1. Assess our progress and check that we are on track.
2. Improve benchmarking and targets for new buildings.
3. Validate our buildings' energy usage against the model(s).
4. Demonstrate what is possible.
5. Ensure that we learn from previous projects.

The London plan draft proposal sets out the requirement for all major developments to monitor and publicly declare their actual operational energy performance. This is necessary so that all the five roles of data described above can begin to be realised across the industry.

Existing Buildings

Existing buildings are a big part of the journey to net-zero. Refurbishment plans need to be well defined and sequenced appropriately to align with the net-zero roadmap. This allows maximum benefit from an energy and carbon perspective to be delivered cost effectively.

Actual data can inform the design of new systems at the capacities and requirements that suit the building before refurbishment plans are defined. This approach prevents like-for-like replacement, which often lead to poor performance and excess capacity.

Designers should also consider embodied carbon as a key parameter in design to help the net-zero transition.

Jennifer Elias (Cundall), Oliver Lockhart (Hoare Lea) and Khasha Mohammadian (Carbon Intelligence), August 2020

Key Issues

- Managing thermal comfort while reducing HVAC energy.
- Reducing tenant small power and information technology (IT)/server energy loads is key.
- Avoiding oversizing by doing mechanical equipment sizing calculations on low internal loads.

- Data strategy must align with building model to allow a fair comparison of design to reality.
- Context (such as occupancy profile and other factors) allows data to become useful design/comparison information and is therefore a key aspect of the data strategy.
- Tenant engagement is crucial as energy used by tenants is a big proportion of total energy.
- Learn from pilot projects as much as possible before a mass roll-out is adopted.

Links

- The UK Green Building Council Net Zero Targets for Offices is available at: <https://www.ukgbc.org/wp-content/uploads/2020/01/UKGBC-Net-Zero-Carbon-Energy-Performance-Targets-for-Offices.pdf>
- LETI's Climate Emergency Design Guide is available at: <https://www.leti.london/cedg>
- The "Be Seen" Pre-Consultation Draft is available at: <https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/planning-guidance/be-seen-energy-monitoring-guidance-pre-consultation-draft>

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