



The Objective

TFL is focused on creating urban spaces that promote good design principles. For this reason, they are an advocate of the **Mayors Good Growth by Design** program, an initiative that takes into consideration: sustainable practices, fostering diverse communities and responsible use of resources. TFL is thus motivated to design public areas and spaces that are efficient and accessible to all communities.

Consequently, we have been working closely with the TFL team to deliver further energy efficiency targets for their open-plan office building in 5 Endeavour Square, Stratford, London. The building's office floor space is 25,000 sqm and has a Trend BMS, 6 AHUs, with UFAD and passive chilled-beams throughout, and district heating supply. It was newly completed in 2017, with approximately 2,000 people using it on a daily basis. Their goal is to run the building more efficiently during the day and night as certain departments have running costs that are 24 hours. The building team is interested to understand how often this occurs, and how LightFi can help reduce these running costs, reduce wasted energy and help reduce the overall carbon footprint of the building.

The Solution

In order to achieve these goals, we managed a pilot on one of the 9 floors. Together with TfL, Verco and Electracom, we designed a control strategy that considered psychrometric conditions necessary for chilled beams. We subsequently installed 2 occupancy sensors (and 2 environment sensors) to control the ventilation dampers on the CAV on this floor according to live occupancy percentage. During low occupancy the CAV damper would partially close, and the AHU fan would lower its speed to keep the pressure in the duct at set-point. All 4 devices were installed over 1 evening with no disruptions to working hours.

The result

By controlling 1 floor of the building so far, operating 75% of the time, we were already able to uncover approximately £4,700 savings from reconfiguring the AHU fan speed. Additional savings of £2,100 & £700 from reducing cooling & heating loads on the AHUs - over one year. TFL were able to see a payback in just 8 months, and we estimate the potential savings for all 9 floors of the building to be around £51K annually (£2.04 per m²) – around 17% savings of the in-hours total energy consumption for a newly built building.

Using Defra's 2019 conversion factors of 0.255, LightFi is currently reducing the building's carbon emissions by 22 T CO₂e annually. This has already helped TfL improve the building's DEC rating. When installed through all floors of the building, it has the potential to reduce the carbon emissions by a total of 150 T CO₂e each year.

Further to the savings we have uncovered to date, we were able to maintain existing optimal thermal comfort levels and good indoor air quality.

