

Can we make our office buildings more responsive? Energy-efficiency and behaviour in the post- pandemic office

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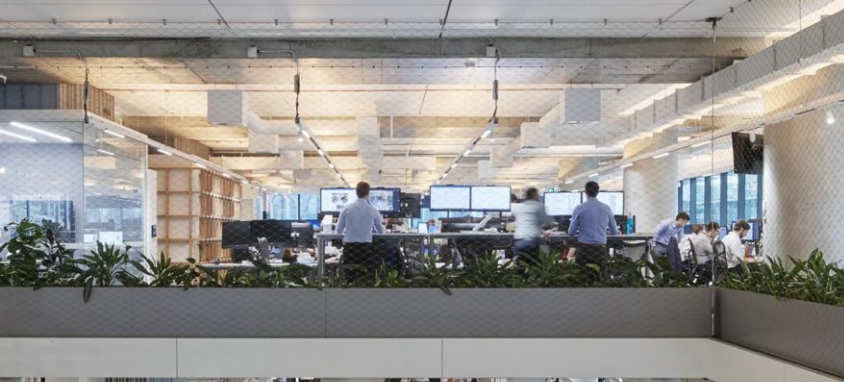


How did we and our offices react to the Covid19 pandemic?

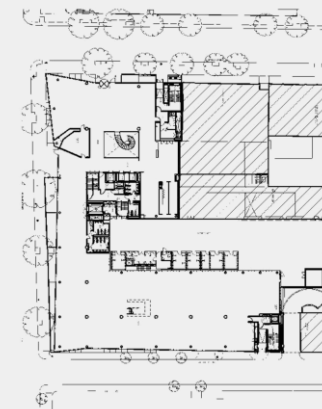
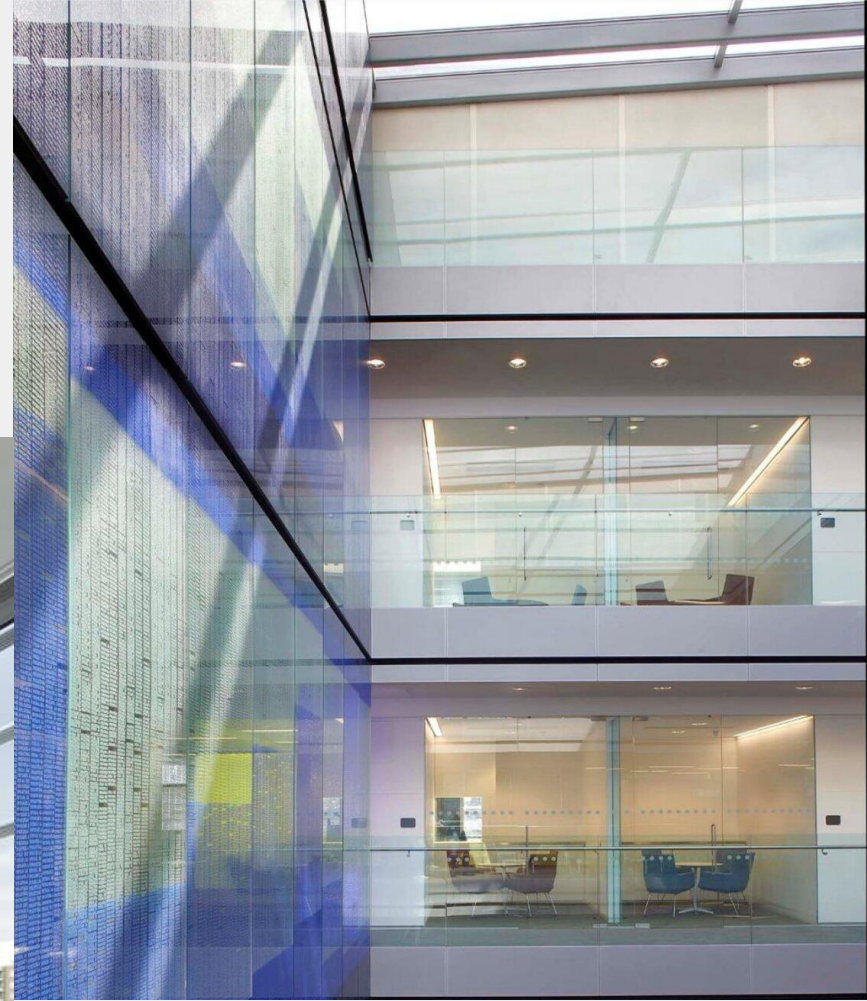


3 ARUP OFFICES
ENERGY MONITORED
SINCE 2019

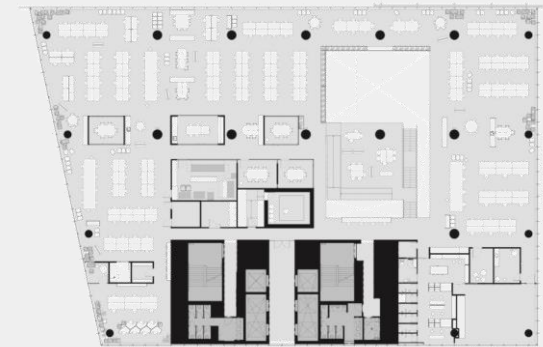
1 FOCUS GROUP
SATISFACTION SURVEYED PRE- AND DURING-
COVID19



TOKYO
Size 632 m²
Occupancy 100



LONDON
Size 16,420 m²
Occupancy 2000

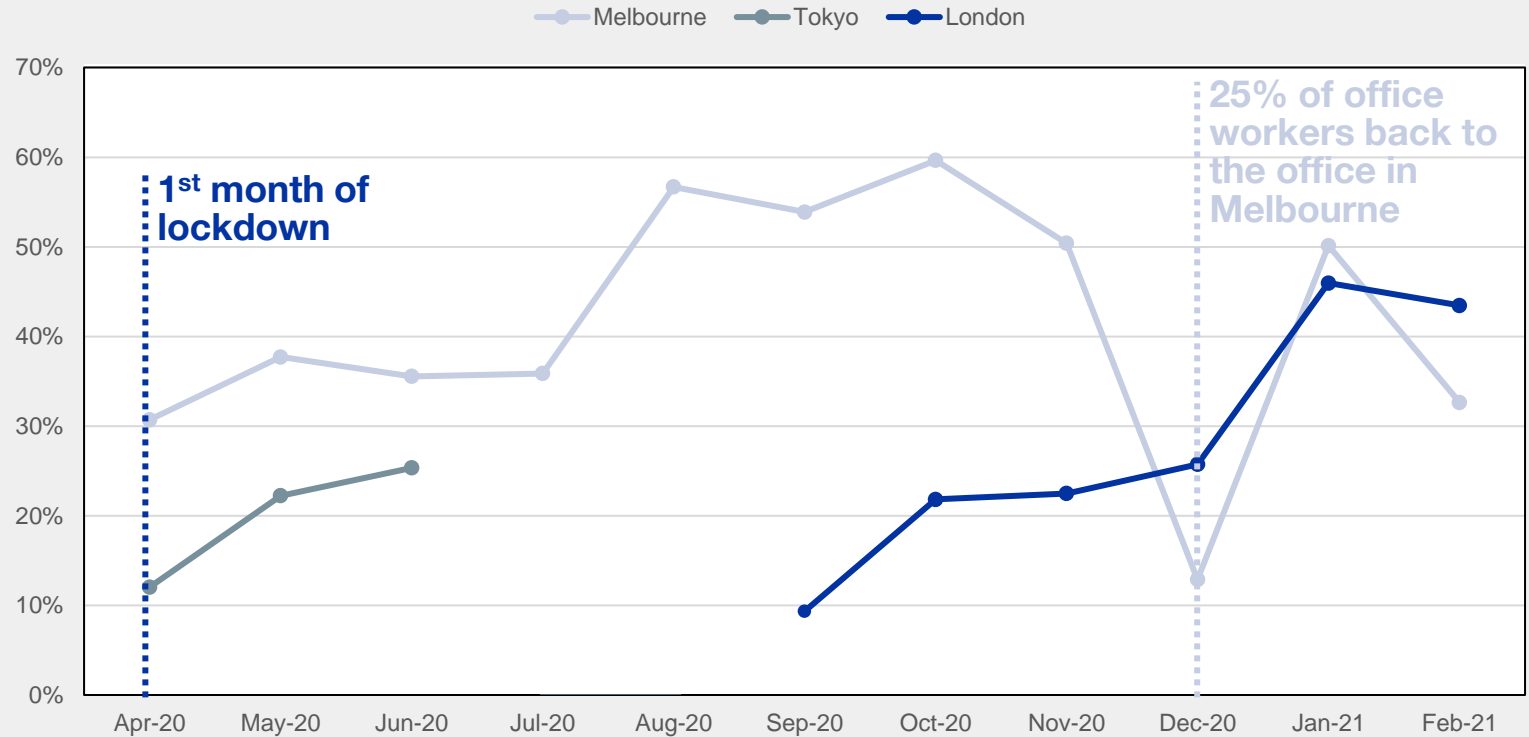


MELBOURNE
Size 5100 m²
Occupancy 450

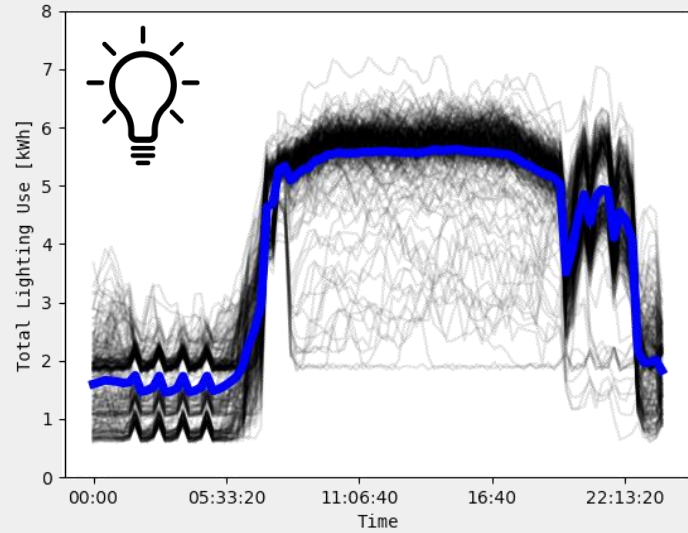
WITH OCCUPANCY LEVELS NEARING 0%, MAX MONTHLY SAVINGS NEVER SURPASSED 60%

A LEARNING FACTOR IS VISIBLE IN ALL CASES

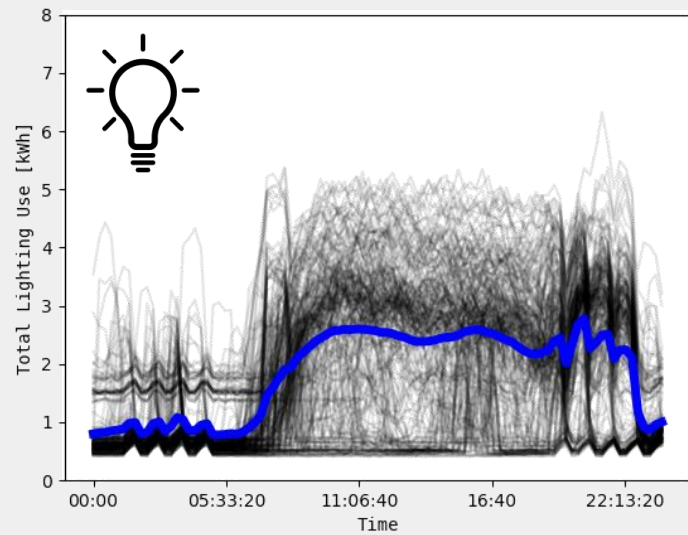
Energy savings per month compared to previous year [%]



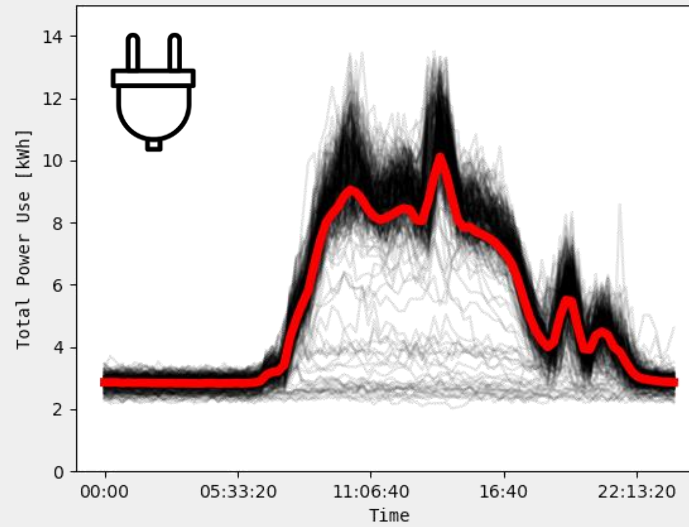
Weekdays



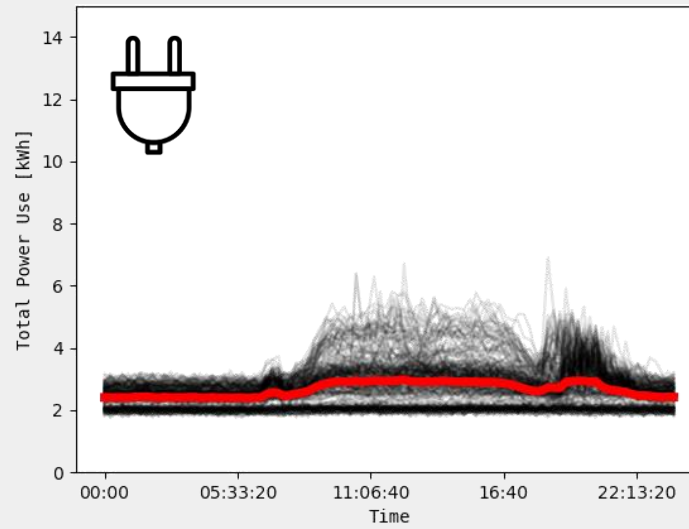
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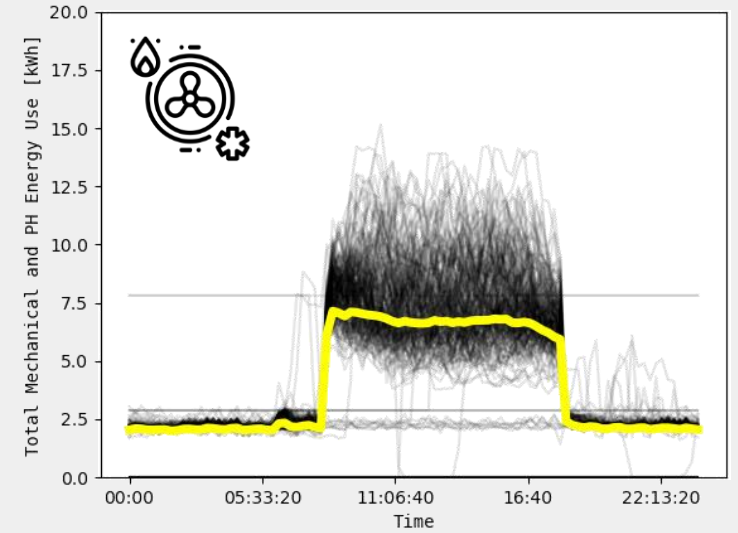
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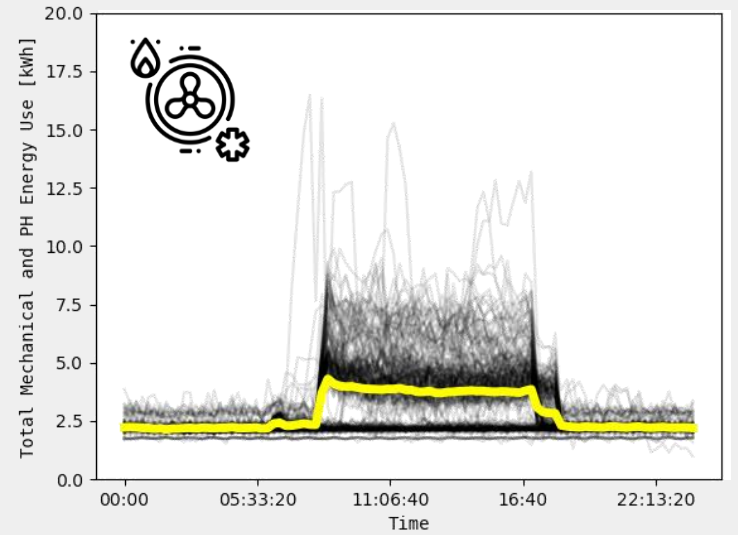
Weekdays



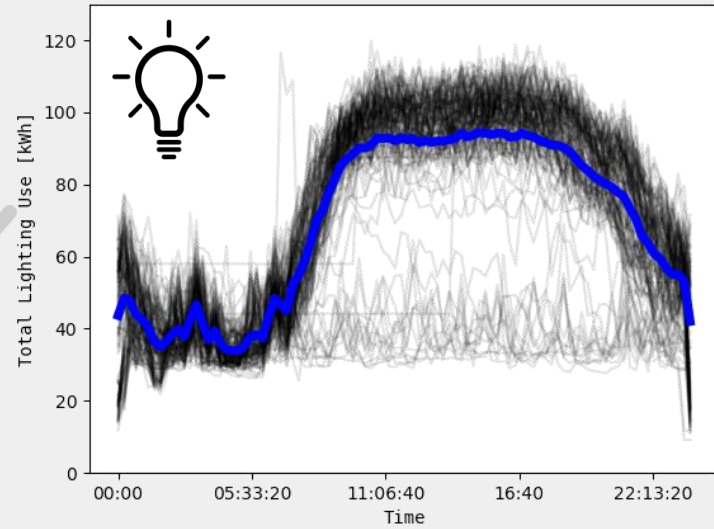
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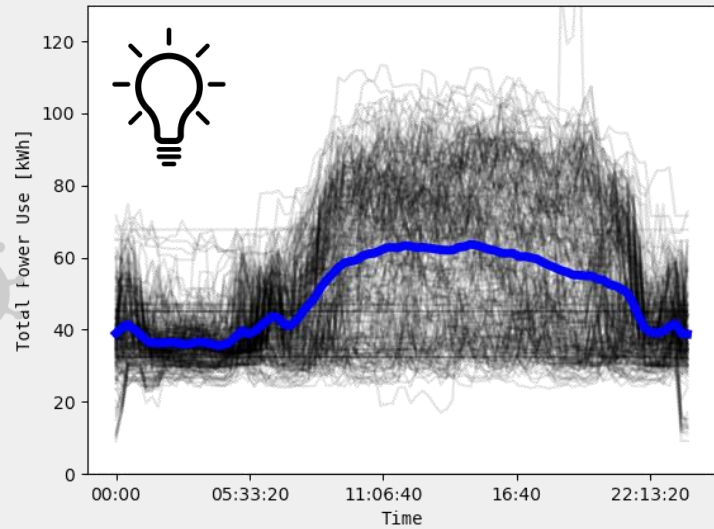
Weekdays



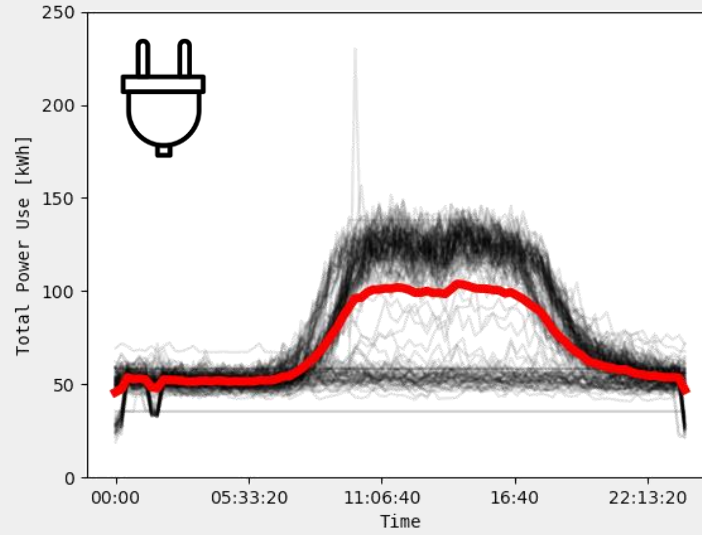
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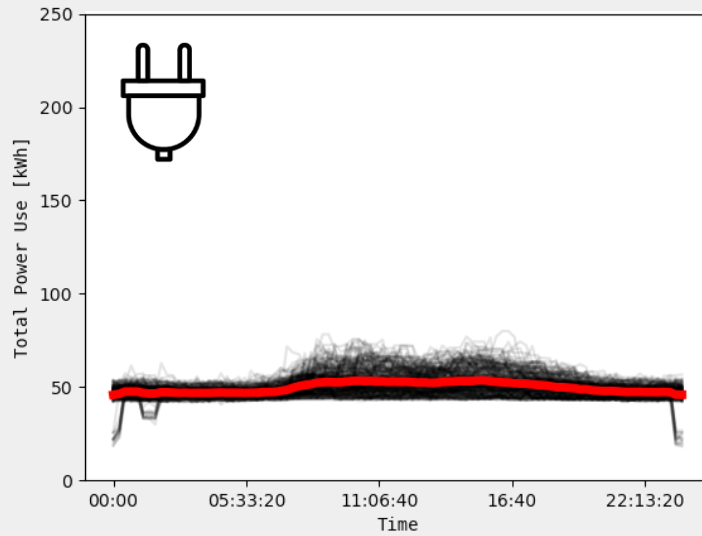
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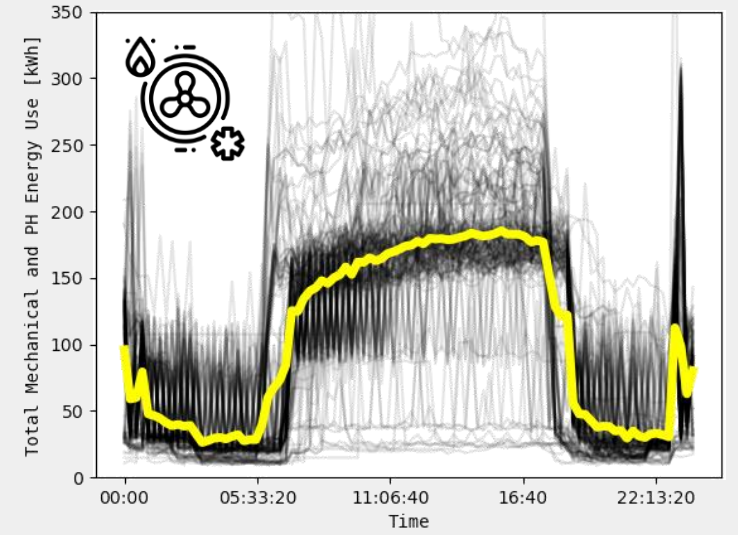
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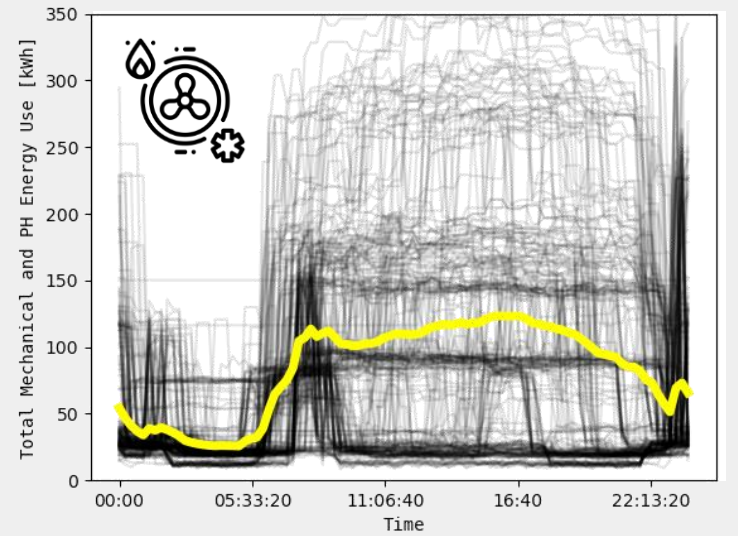
Weekdays



Weekdays



Weekdays

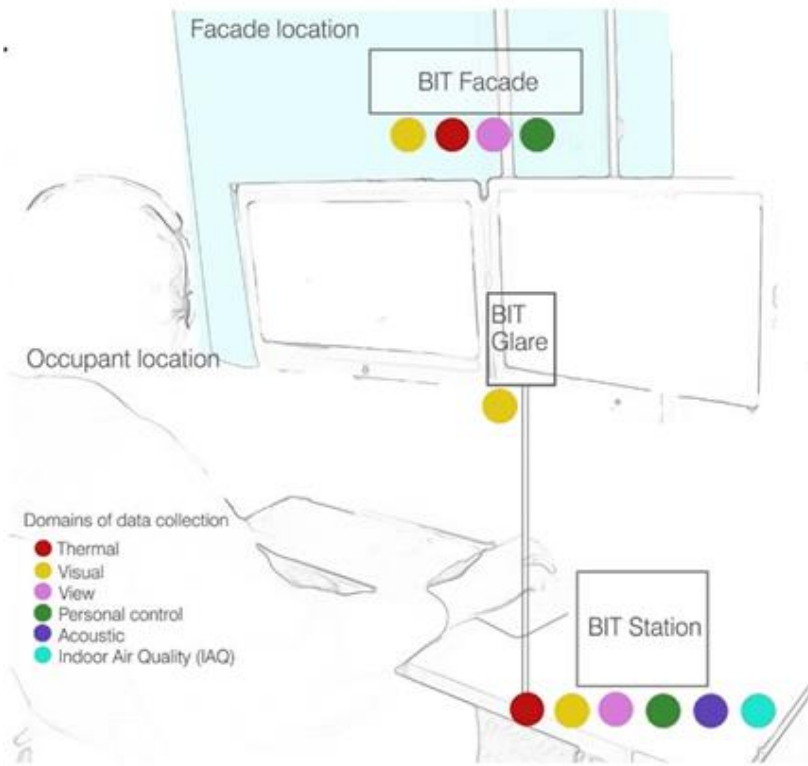


**LONDON: A CLOSER LOOK TO OCCUPANT SATISFACTION AND OCCUPANCY
PRE AND POST-PANDEMIC**

FOLLOW-UP OF ONE TEAM IN LONDON



BIT: IoT toolkit to capture occupant-facade interaction

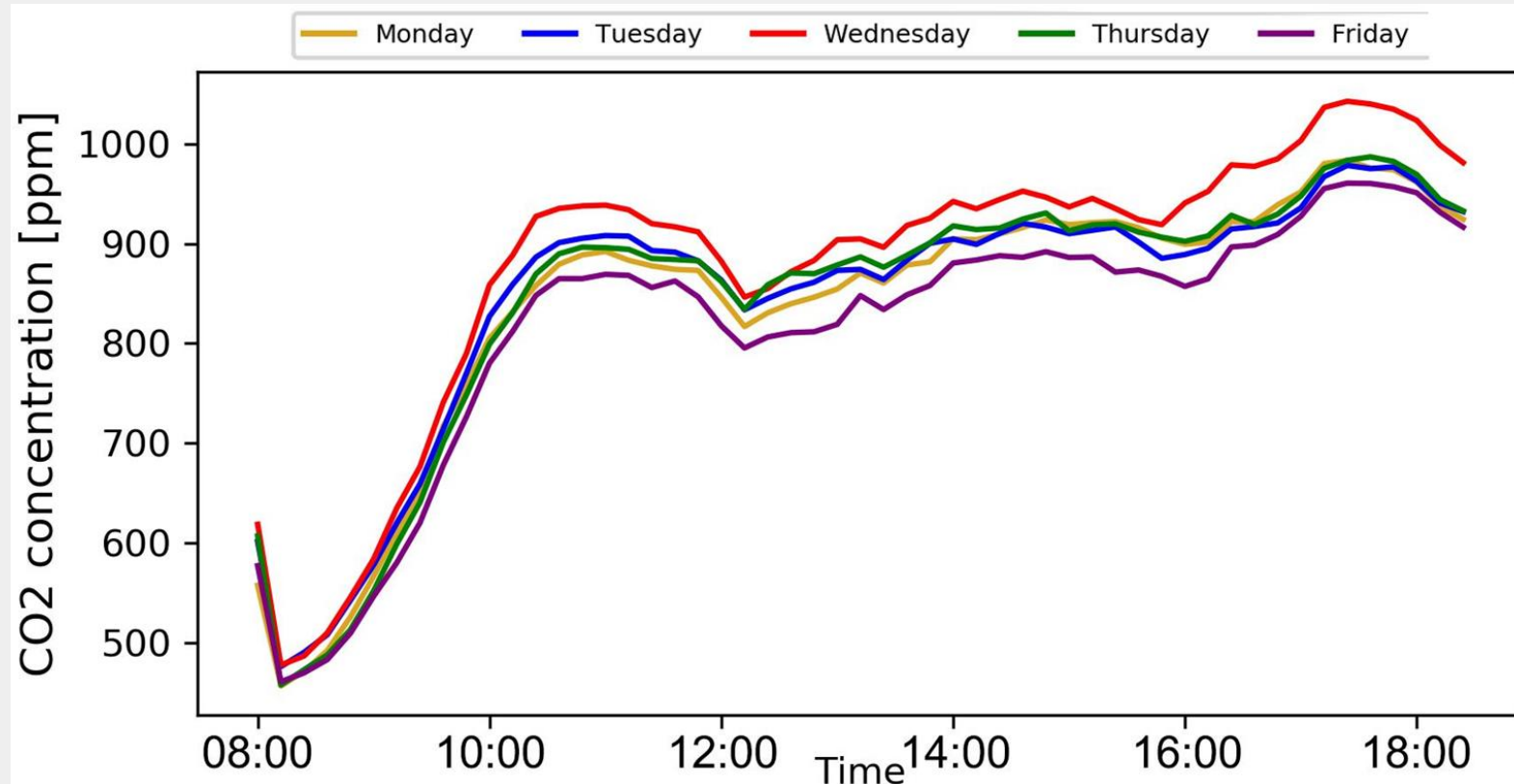


■ Thermal ■ Visual ■ Air quality ■ Acoustic ■ Personal control



(Luna-Navarro et al. 2021)

OCCUPANCY BEFORE PANDEMIC - CASE STUDY OF ONE TEAM IN LONDON

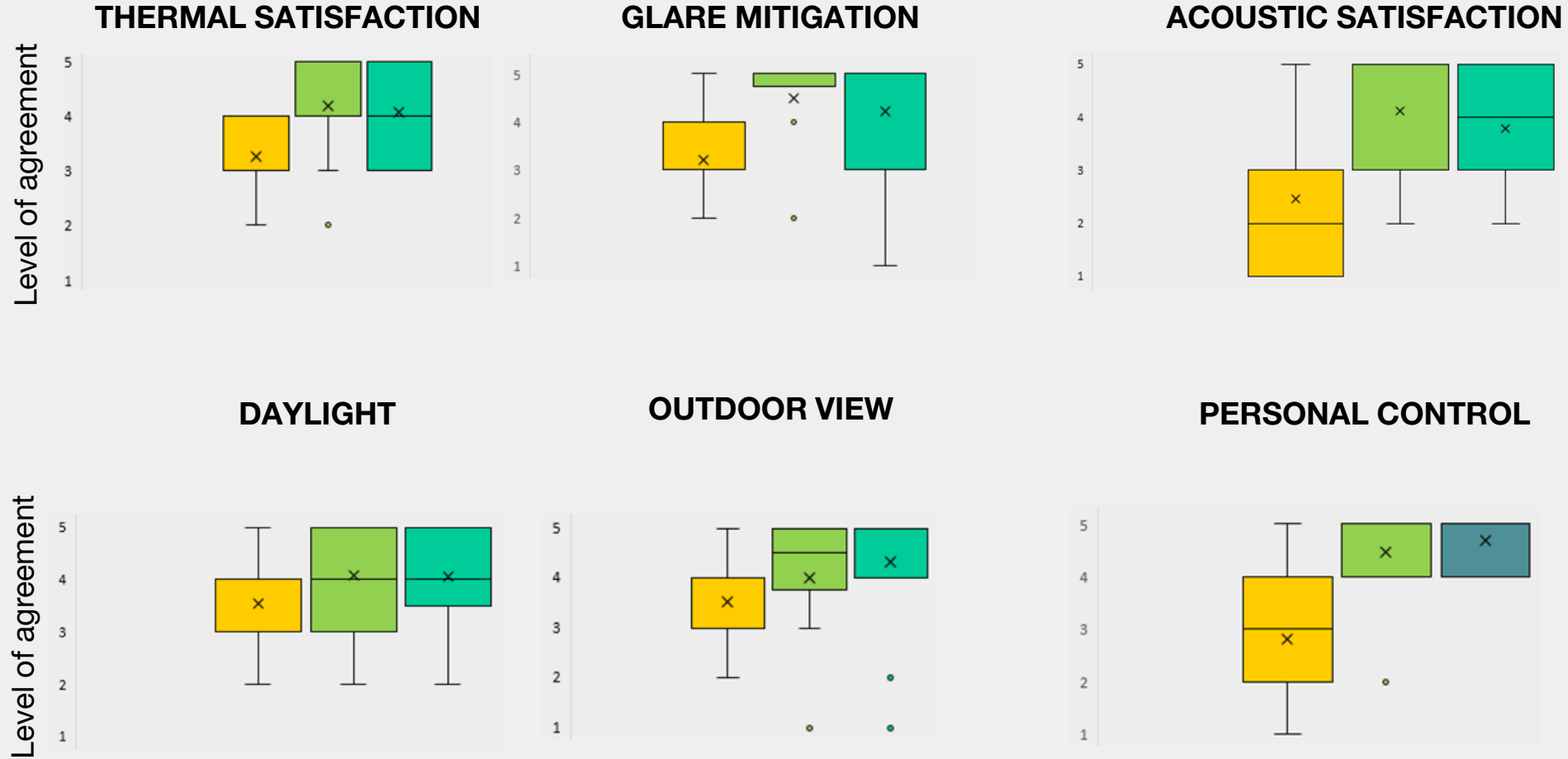


OCCUPANT SATISFACTION PRE - POST PANDEMIC

May 2019

April 2020

June 2020



OCCUPANT SATISFACTION PRE - POST PANDEMIC

May 2019

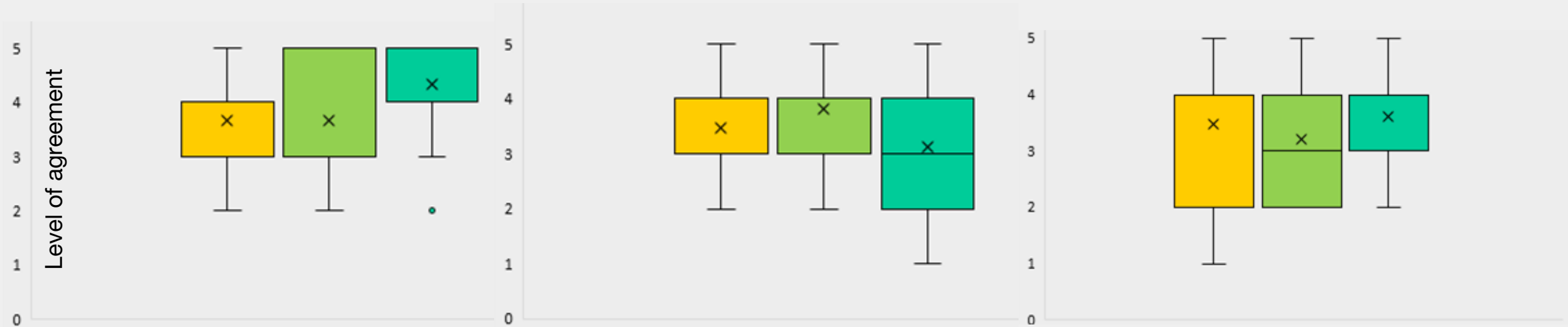
April 2020

June 2020

PRODUCTIVITY

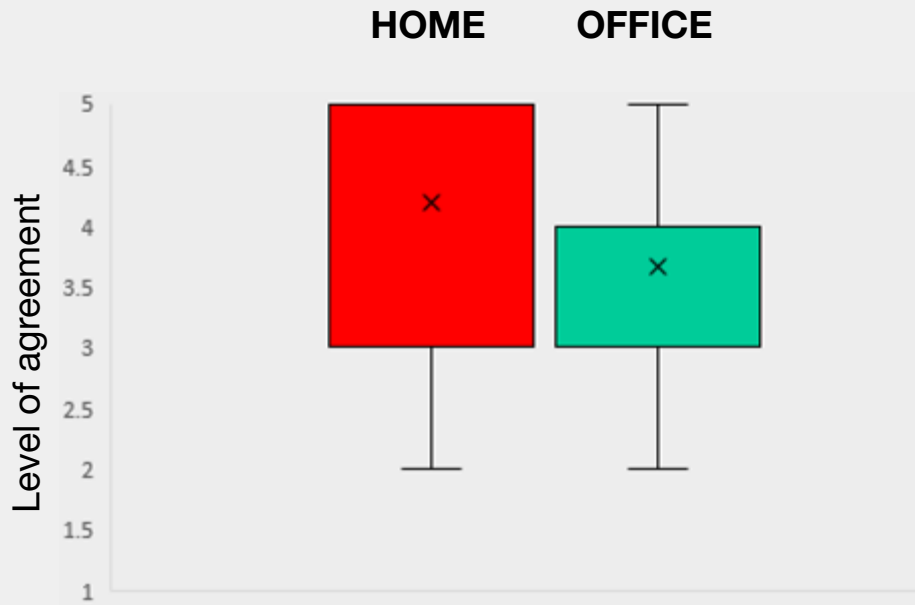
WORKLOAD

FITNESS

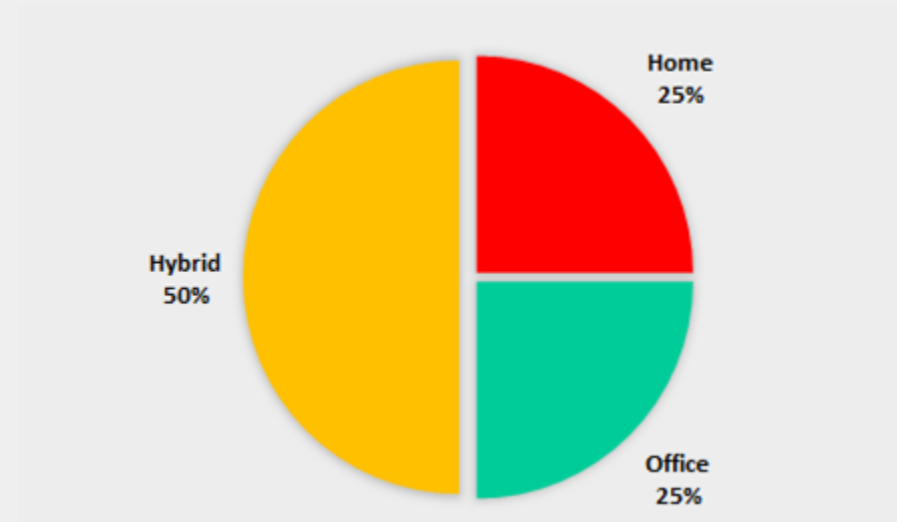


OFFICE OR HOME?

I LIKE WORKING FROM...



WHAT DO YOU PREFER?



VARIABLE OCCUPANCY PATTERNS ARE EXPECTED TO BE MORE SIGNIFICANT WITH THE RETURN TO OFFICE: **WE MUST ENABLE OUR BUILDINGS TO BE RESPONSIVE AND LEARN HOW TO ADAPT**

DESPITE OCCUPANCY NEARING 0-10%, **BUILDINGS STILL USE 90-40% OF FULL-OCCUPATION ENERGY**

PLUG-LOADS SHOWED THE MOST FLEXIBLE RESPONSE, WHEREAS LIGHTING LOADS AND MECHANICAL LOADS WERE LESS FLEXIBLE

A VARIABLE OCCUPANCY PATTERN CAN ALSO BE BENEFICIAL FOR OCCUPANTS, **AND HYBRID SOLUTIONS ARE WELCOME**

OCCUPANTS ARE MORE SATISFIED WITH THE INDOOR ENVIRONMENT AT HOME, **BUT NOT WITH THE WORKLOAD**. THE POST-PANDEMIC OFFICE NEEDS TO IMPROVE EXPERIENCE AND BECOME A DESTINATION, OR WFH WILL BE THE PREFERRED SOLUTION

THANK YOU FOR SHARING YOUR TIME!

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