TEC e
ENERGY & EDUCATION CONNECTED

MANAGING ENERGY USAGE IN A CRISIS

Wednesday 13th October 2021

TEC/Kwiqly/Hoare Lea

TEC e
ENERGY & EDUCATION CONNECTED

HOUSEKEEPING

To help keep background noise to a minimum, we have muted your microphones for this session

Please direct all questions via the chat function so we can ensure all are collated and answered in the Q&A session at the end of the webinar

The webinar will be recorded and made available post event

TECe
ENERGY & EDUCATION CONNECTED

TODAY WE WILL SEE .....

- What happens if we do nothing? How will 2020/21 consumption look against 2021/22 costs?
- How can we use data to identify and then mitigate energy waste and the resultant cost?
- What can we do at a practical level “on the ground” in order to balance energy efficient operations with a Covid safe estate?
- Any questions?

TECe
ENERGY & EDUCATION CONNECTED

FORWARD COVER LEVELS

Gas Cover Levels

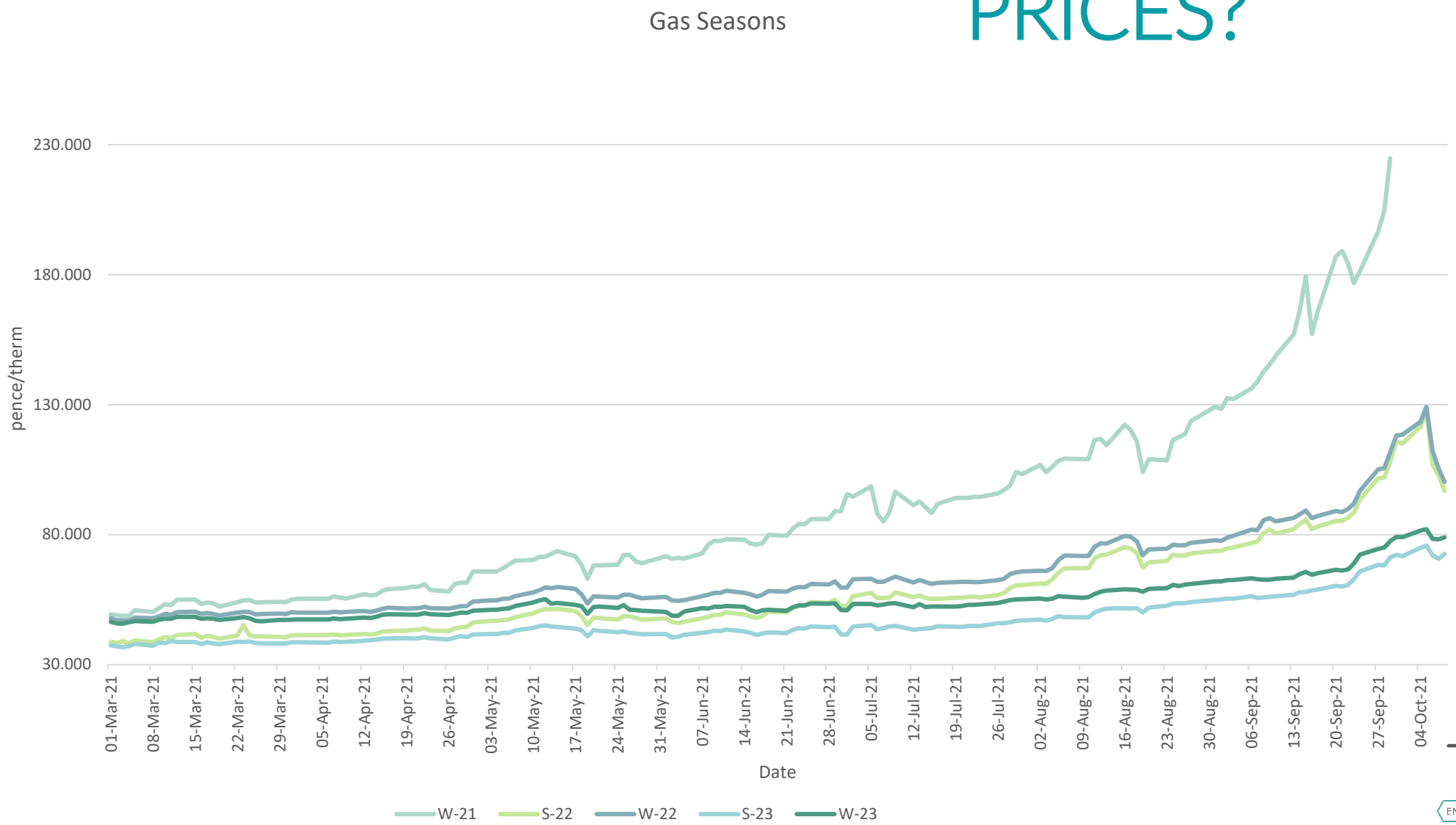
Season	Current Cover
Winter 21	90.5%
Summer 22	78.6%
Winter 22	80.6%
Summer 23	19.9%
Winter 23	0.0%

Power Cover Levels

Season	Current Cover
Winter 21	100.0%
Summer 22	75.0%
Winter 22	75.0%
Summer 23	16.5%
Winter 23	0.0%

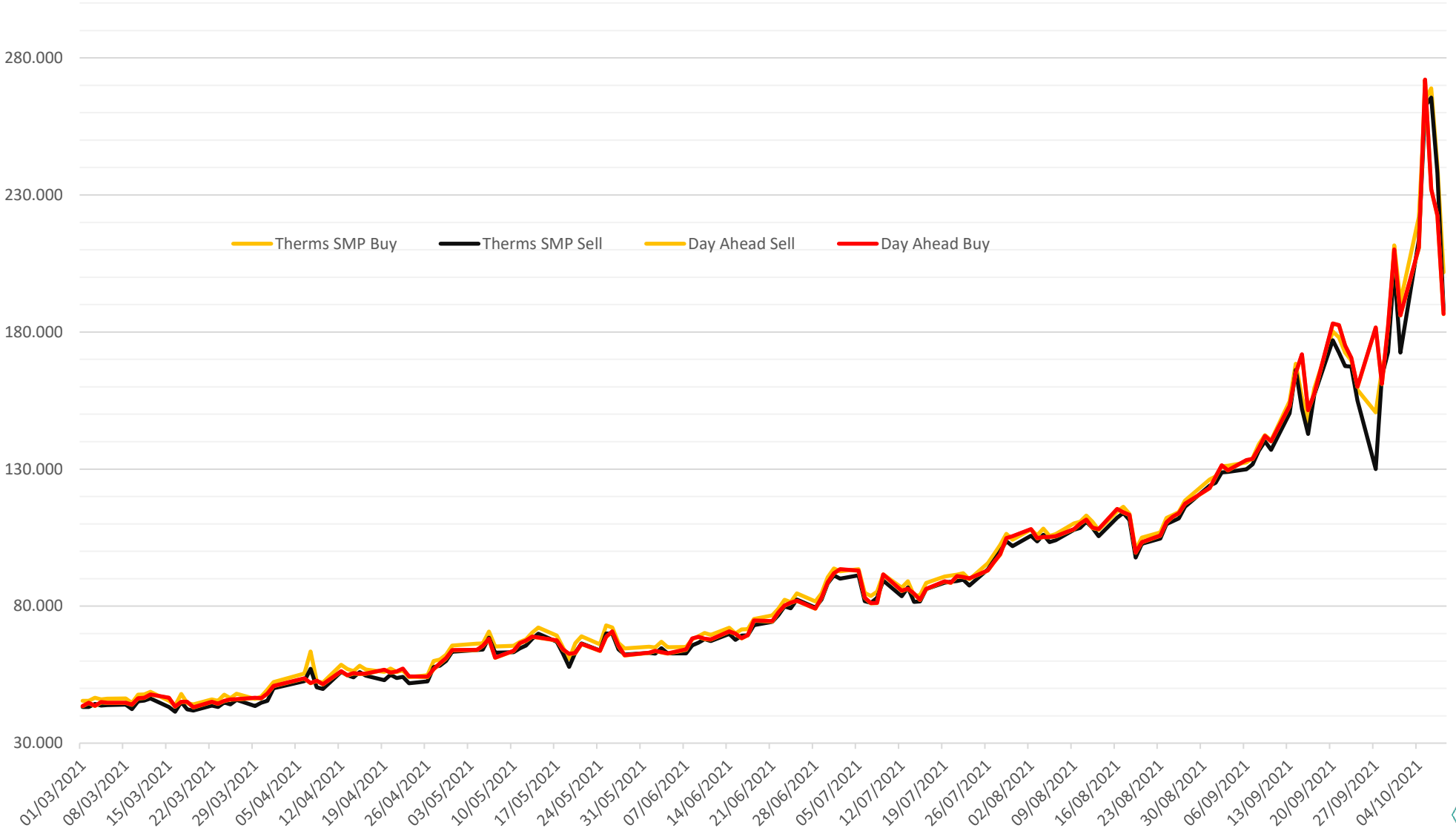
TEC4e
ENERGY & EDUCATION CONNECTED

WHAT HAS HAPPENED TO FORWARD WHOLESALE PRICES?



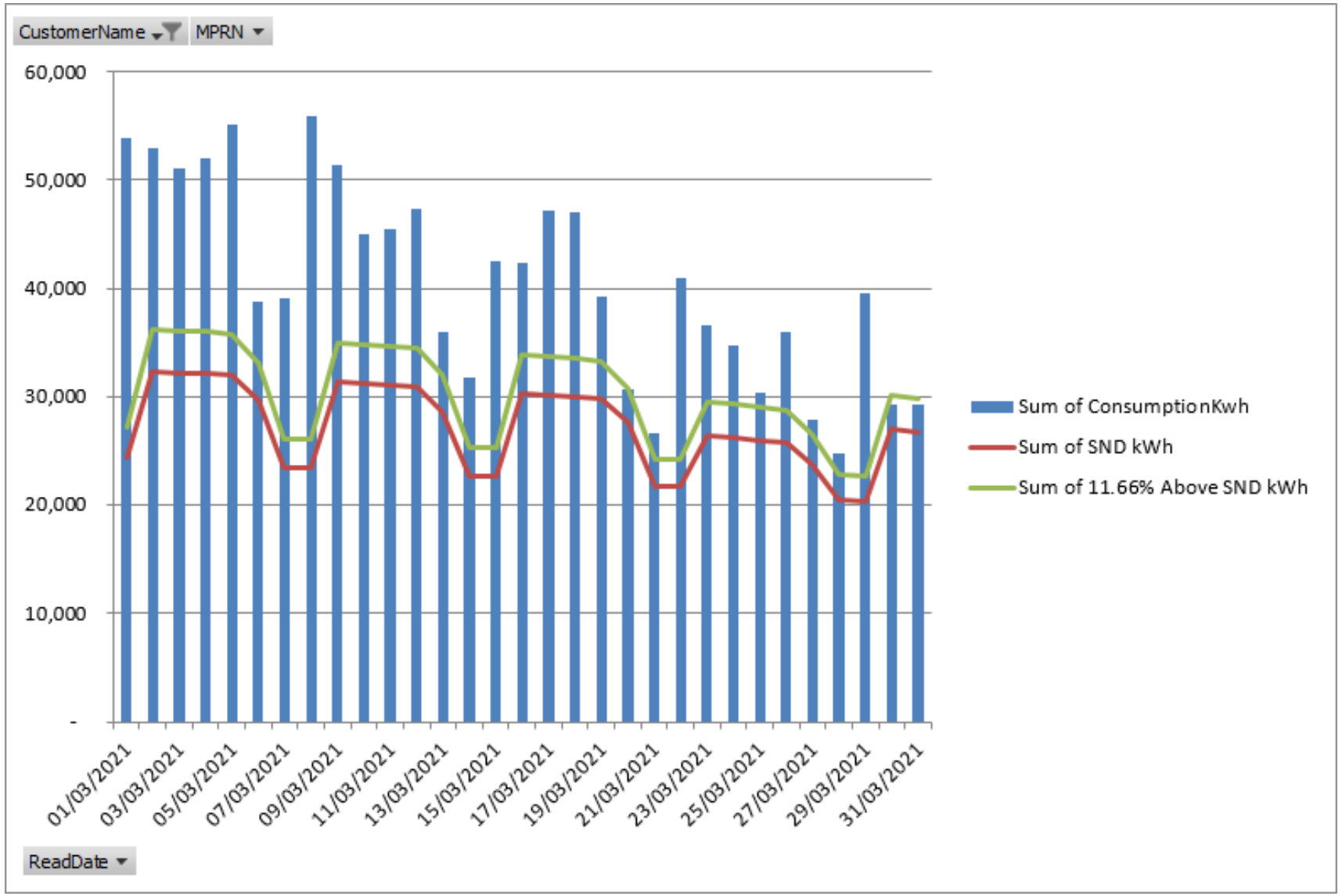
TEC e
ENERGY & EDUCATION CONNECTED

.....AND PRICES USED FOR CASH-OUT



TEC e
ENERGY & EDUCATION CONNECTED

MONTHLY CASH-OUT



TECe
ENERGY & EDUCATION CONNECTED

WORKED EXAMPLE

- March Usage = SND + 30%.
- Original March Cost of Gas 53.33ppt, final CoG 50.20 ppt.
- March usage at August 21 gas costs = 65.95 ppt
- Additional Cost = £15,518 (31.4% up on March).
- Original Monthly Bill (Ex VAT) - £49,460
- Revised Bill £64,978

TEC
ENERGY & EDUCATION CONNECTED

Managing Energy Use in a Crisis

Powered by kWIQly

ENERGY assets

Background

The Starting point

- Data has been logged for years.
- Viewing portals are common.
- Energy services available.
- Net Zero is approaching.
- Environmental, Social and Governance.
- Future working environments.

The Energy Management role needs to change

The Problem Energy Managers face

- Big data cannot be interpreted by humans.
- Weather services are expensive.
- Manual interpretation is time consuming and expensive.

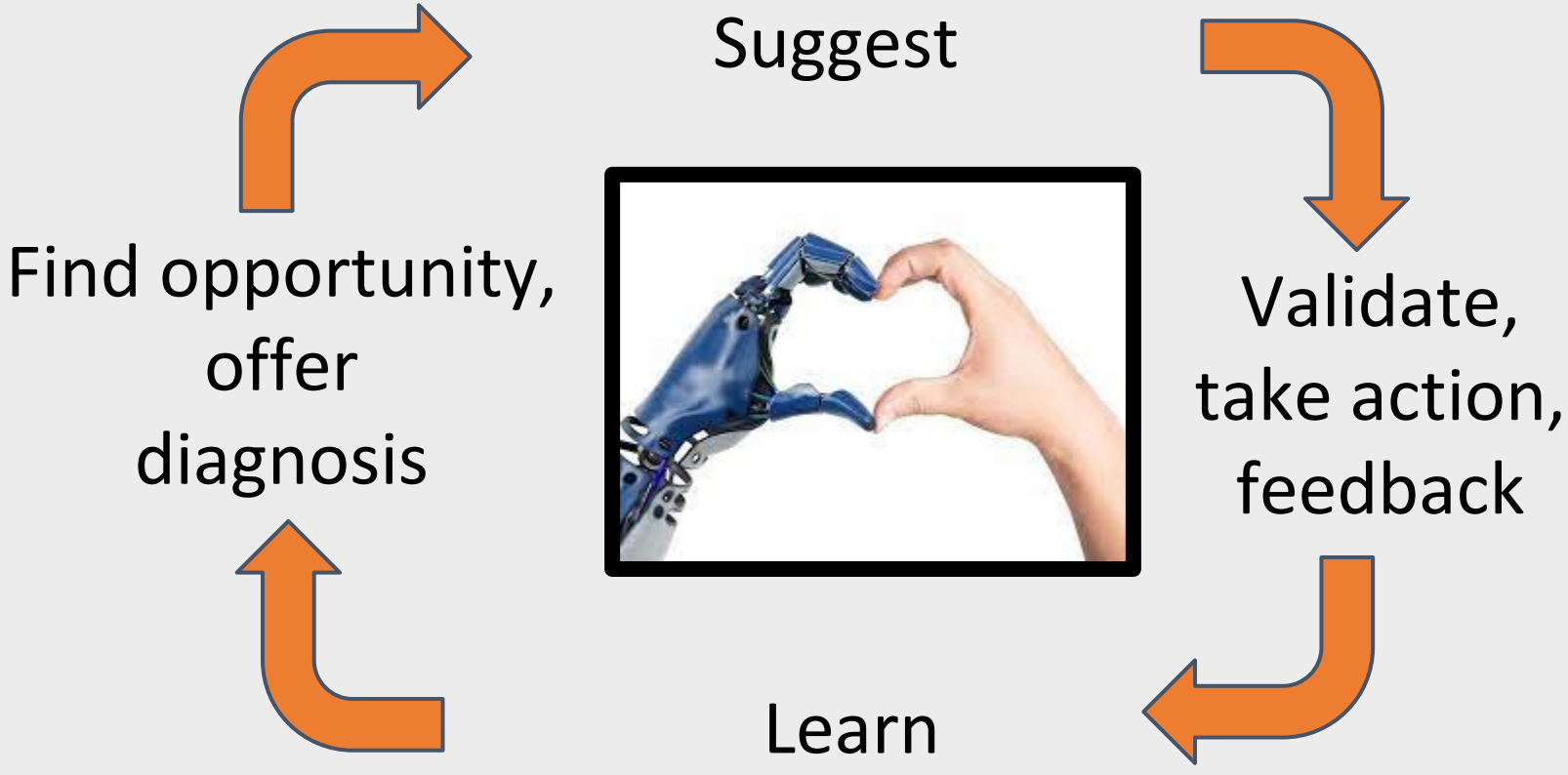
The Problem Energy Managers face

eted

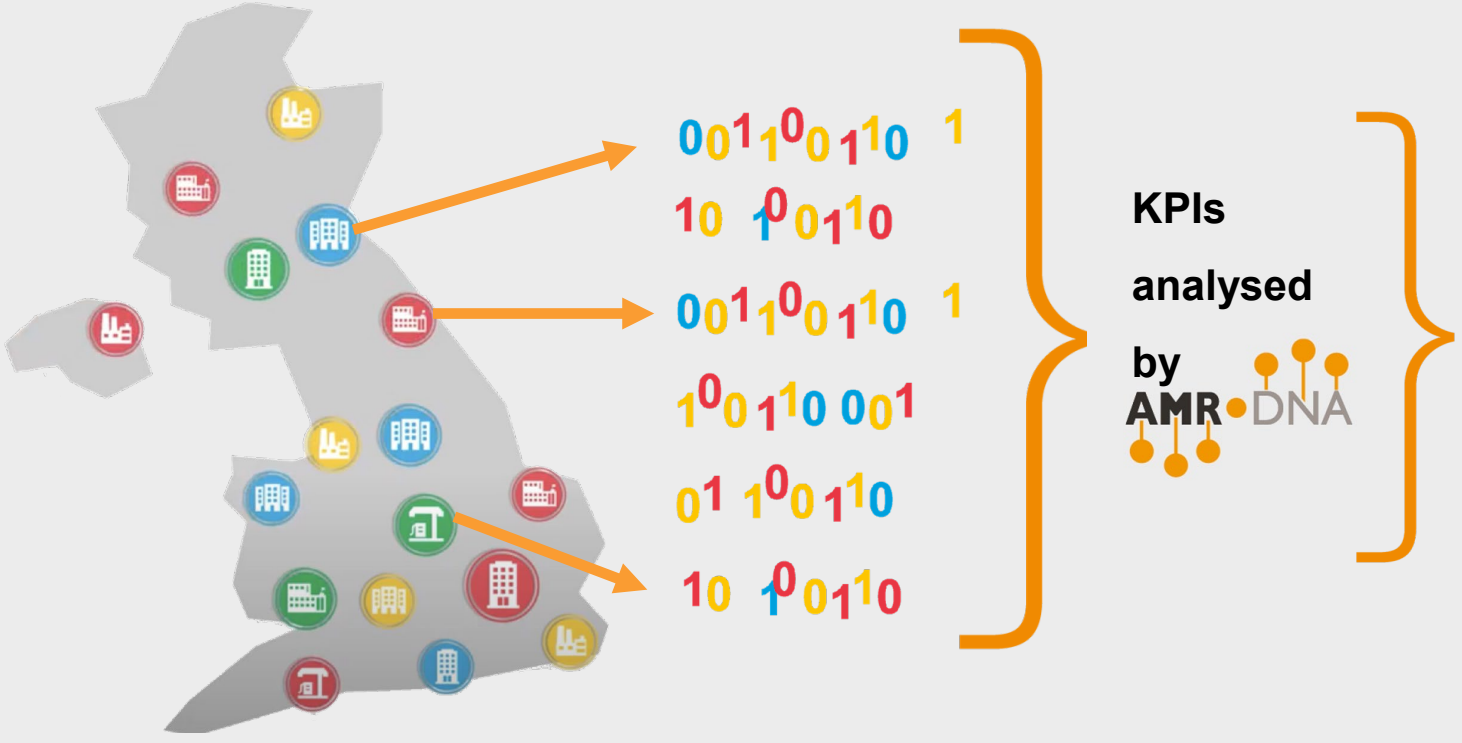
nsive.

ne

The Artificial Intelligence solution



How the AI Solution works



KPIs analysed by AMR•DNA

Gives you your number one priority

Three ways we analyse

1. Past performance

We look how the building has performed in the past and see if it is deviating from its usual performance.

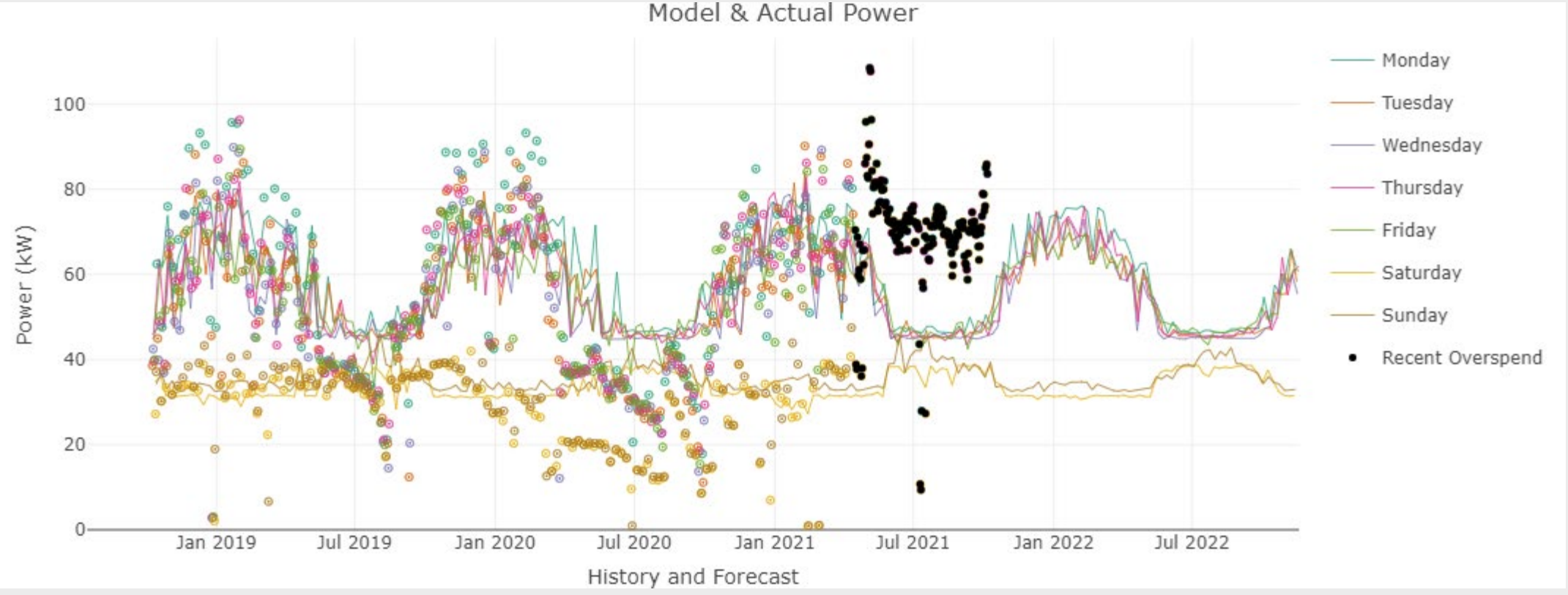
2. Peer performance

Is the building doing as well as other similar buildings?

3. Improved performance

Can the building's control technique be improved?

Tracks performance



Diagnostic support

Current vs achieved in same weather conditions

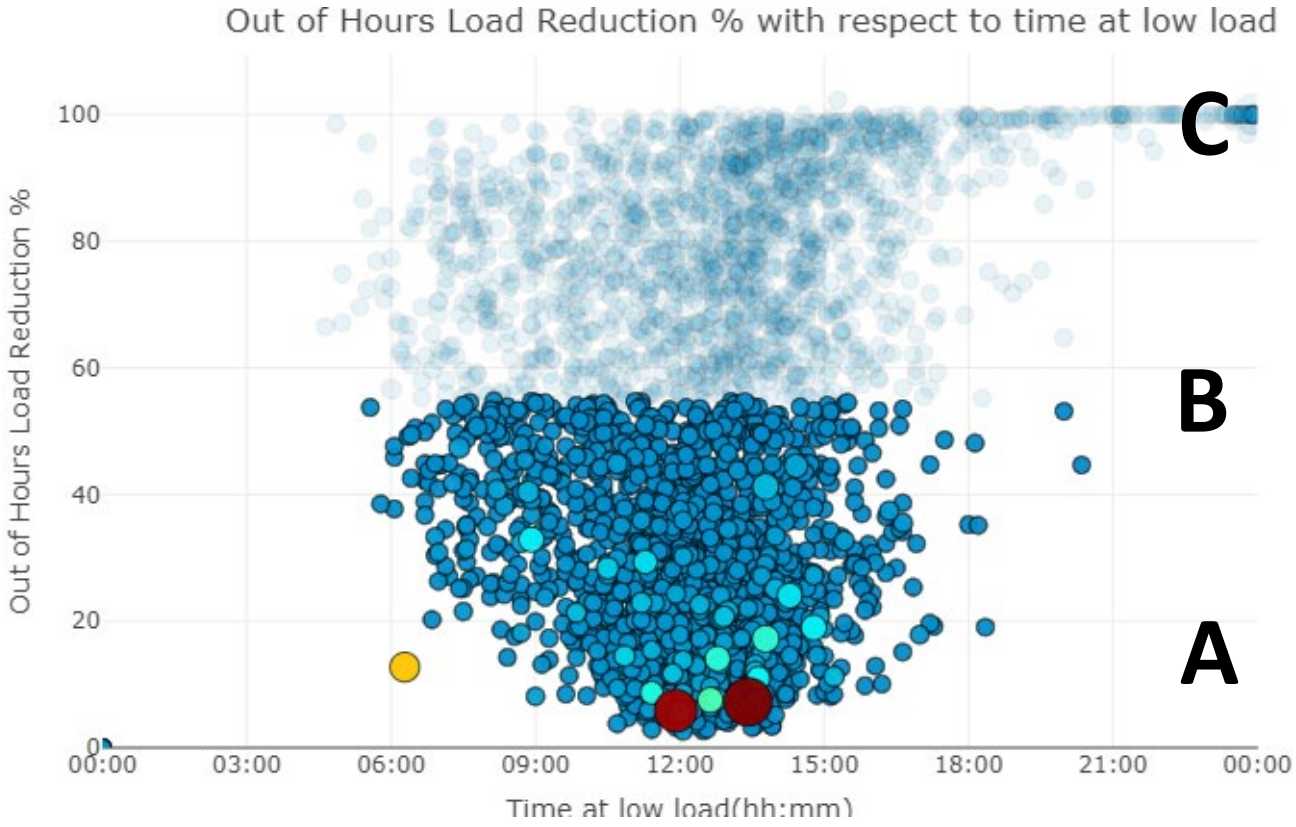
- 35% of TEC members engage with the software

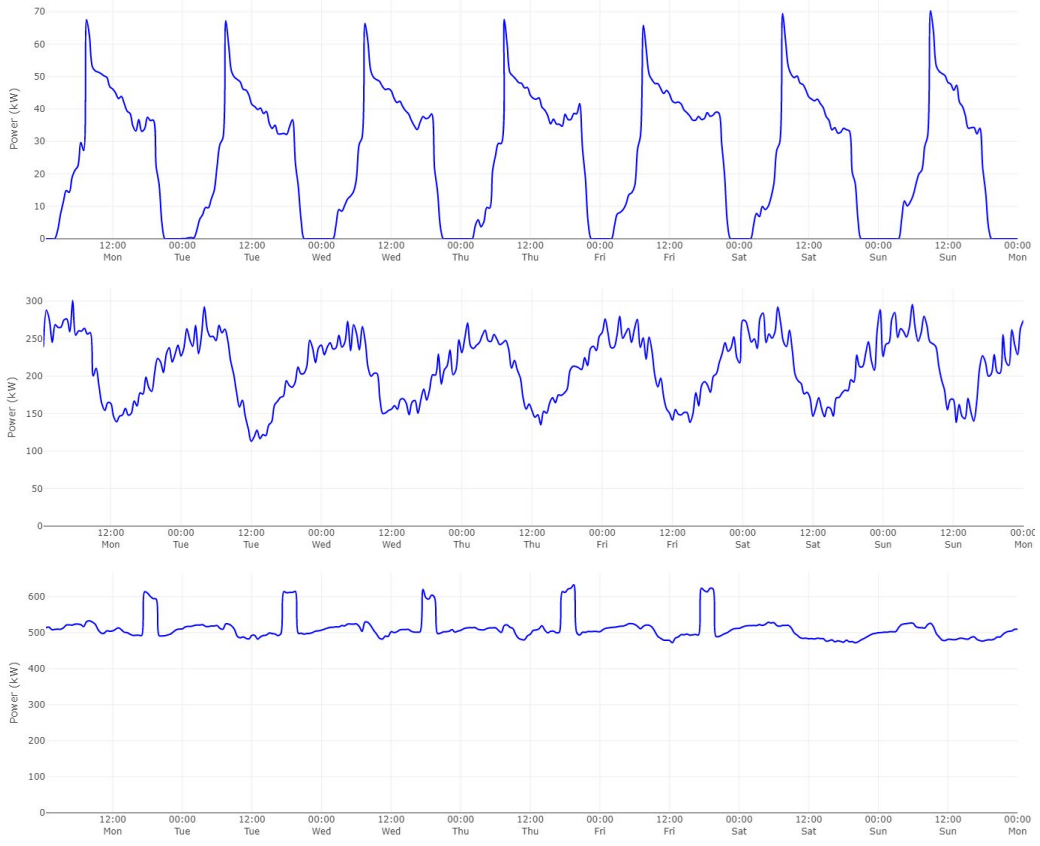
Key benefits from the Model

- Multiple years worth of data
- Non Linear model
- Automated target setting
- Ability to update model (COVID, Poor data, Change of use)

TEC Turndown

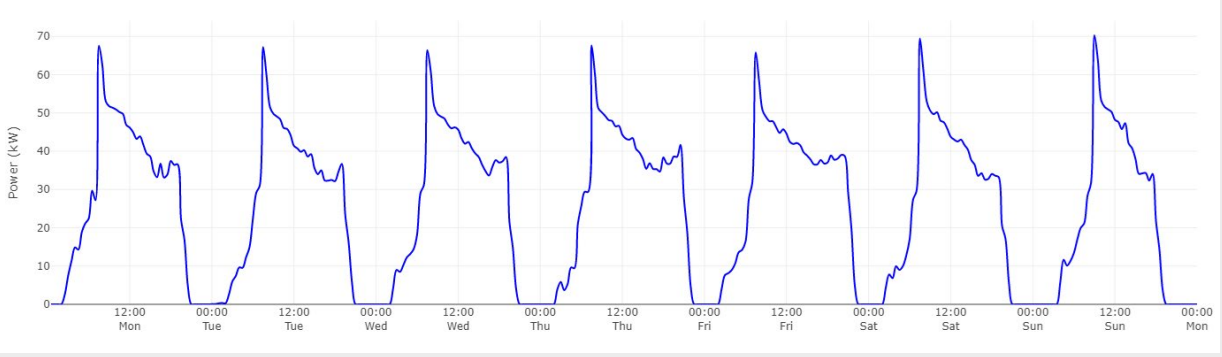
Saving potential of £6,000,000 pa could be achieved (3p per kWh) if all buildings that do not turn consumption down to 50% overnight were to do so.

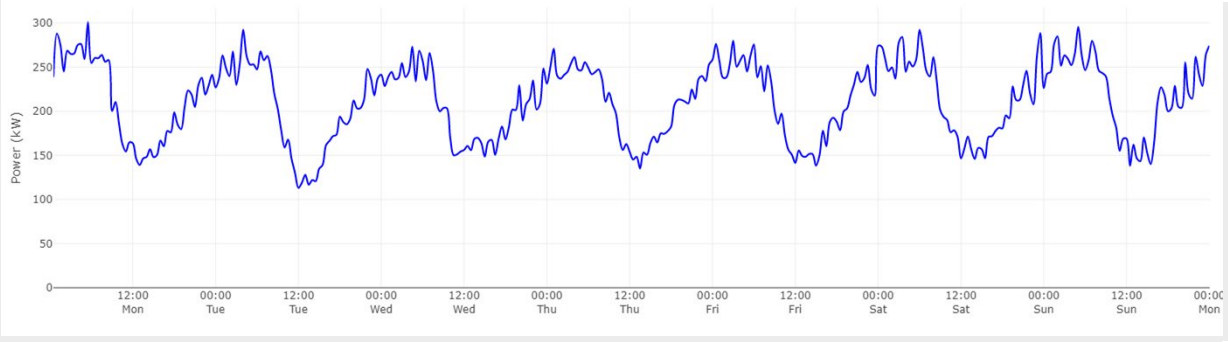




TEC Turndown

40 % turndown more the 33%





26% turndown 33% - 66%

33% turndown less the 66%

New Diagnostics for TEC members

1. New KPI's

Six new KPI's designed to pinpoint where waste is occuring

2. New Format

New KPI specific Emails

3. Collaborate

New tools enable TEC Members to collaborate with AMR DNA / KWIQly staff to help resolve issues

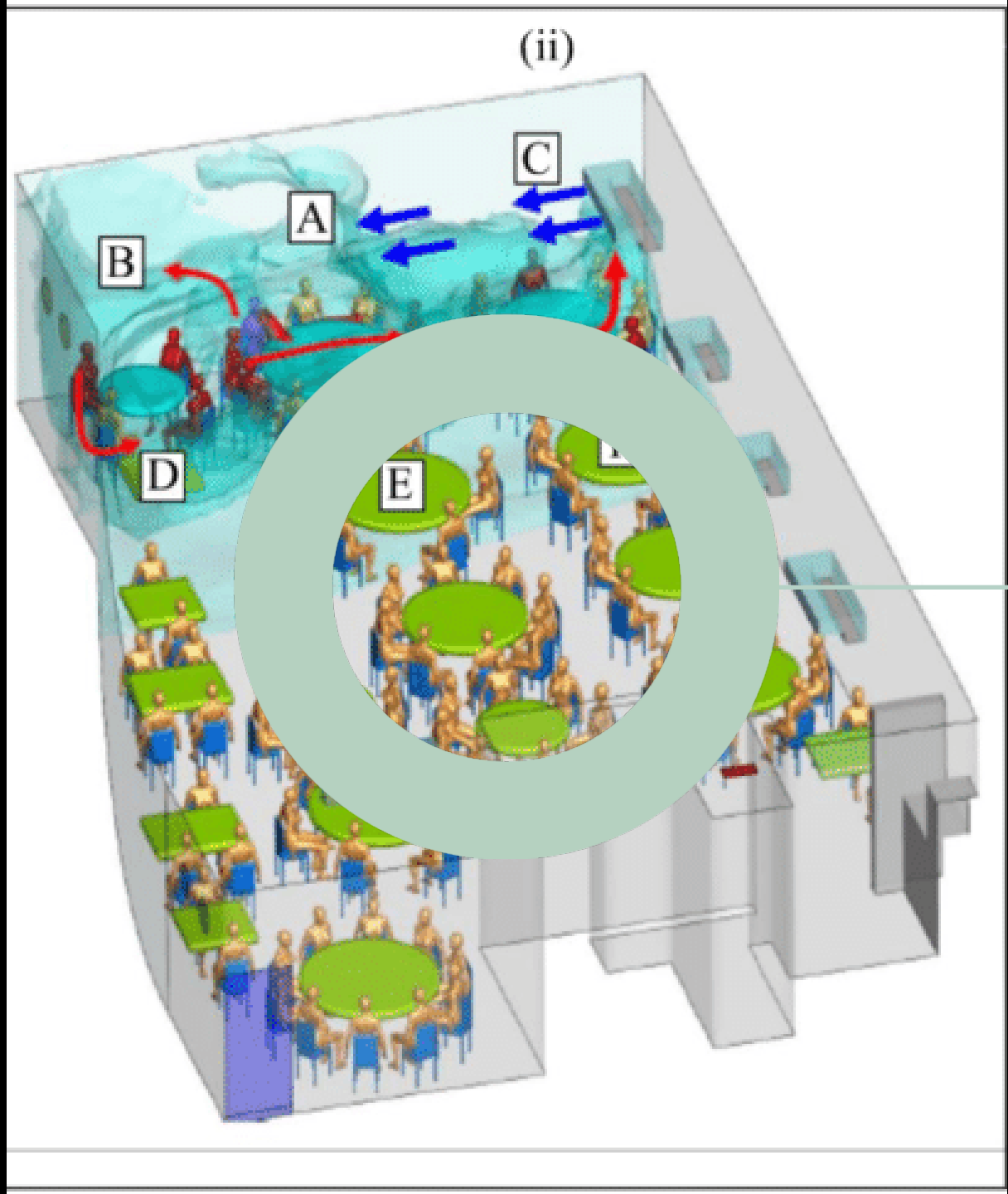
HOARE LEA

Reducing energy consumption during COVID-19.

Existing buildings.

HOARE LEA

A CONVERSATION WITH TEC MEMBERS



HOARE LEA

Contents.

HOARE LEA

The risk of transmission of COVID-19 cannot be eliminated purely by changing the ventilation system or how it works.

HOARE LEA

Industry guidance.

- **World Health Organization (WHO) -** Roadmap to improve and ensure good indoor ventilation in the context of COVID-19
- **SAGE:** Role of ventilation in controlling SARS-CoV-2
- **SAGE:** Potential application of Air Cleaning devices and personal decontamination to manage transmission of COVID-19
- **SAGE:** EMG and SPI-B: Application of CO2 monitoring as an approach to managing ventilation to mitigate SARS-CoV-2 transmission, 27 May 2021
- **CIBSE COVID-19 Ventilation Guidance**
- **CIBSE COVID-19 Air Cleaning Technologies**
- **REHVA COVID-19 Guidance Document**
- **BCO Briefing Note:** Thoughts on ventilation design and operation post COVID-19
- **BCO Briefing Note:** Thoughts on ventilation design and operation post COVID-19: Supplementary material and bibliography

HOARE LEA

General advice is to increase air supply & exhaust, supplying as much outside air as possible.

HOARE LEA

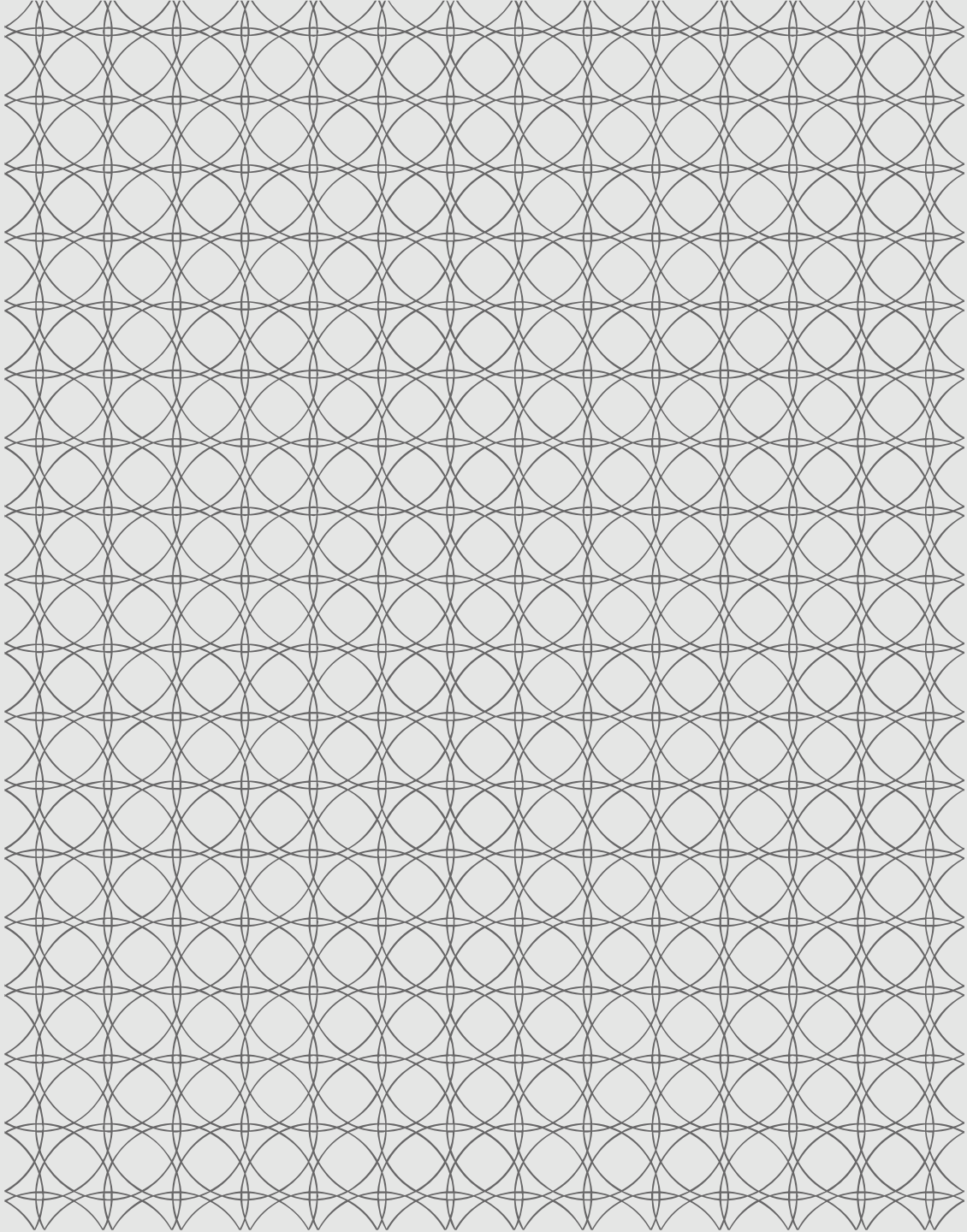
Contents of guidance.

IN ONE SENTENCE (PER HEADING).

System.	COVID-19 Guidance.
Natural ventilation.	Open as much as possible.
Mechanical Ventilation.	Turn on 1hr before and after occupancy.
Ventilation rates.	At least 10l/s/person or monitor CO2.
Relative humidity.	Ideally at 40%-60% but it's not conclusive.
Recirculation	Turn off unless it is needed for fresh air supply or it is a single occupancy room.
Thermal wheel heat recovery.	If it runs on negative pressure differential, turn it off.
Duct cleaning and filters.	Be aware that filters and ducts may be contaminated.
Fan coil units.	Ensure low velocities, clean filters and extend run hours.
"Air cleaners".	Not enough evidence that they work, ventilation is better.

HOARE LEA

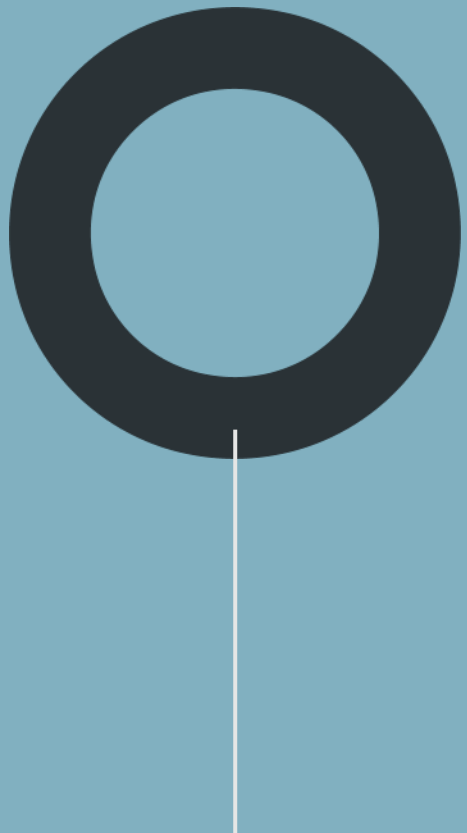
Energy reduction.
Step by step.



HOARE LEA

How do we approach energy reduction in existing buildings?

1. **Optimise** what you've already got.
2. **Replace** what's inefficient.
3. **Reduce** what you need.



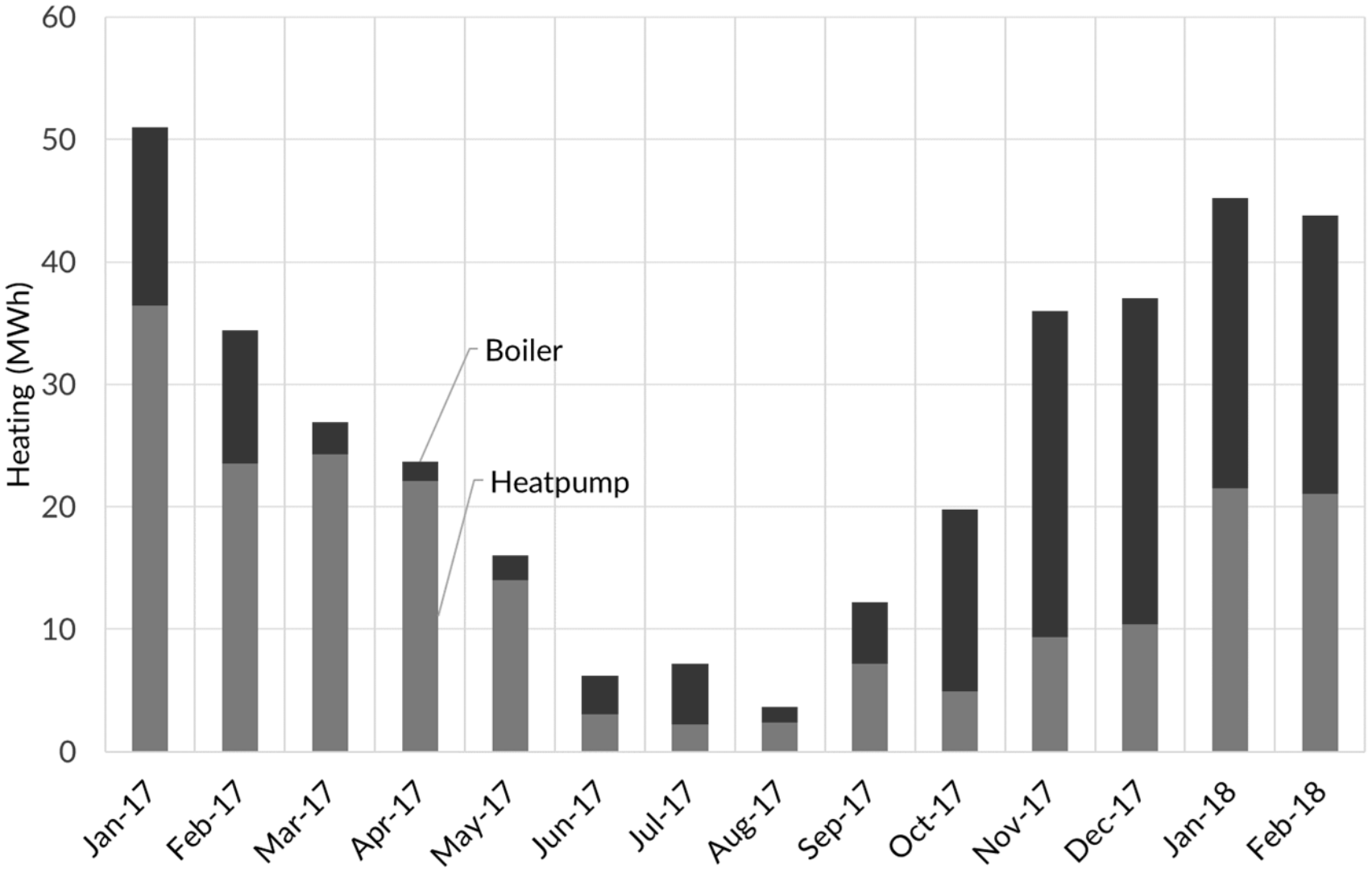
HOARE LEA

1. Optimising building systems.

Our most common interventions.

- Revise time-clocks including optimised starts/stops.
- Check dehum. controls.
- Reduce flow rates/pump speeds.
- Check for short cycling / PI loops.
- Demand controlled ventilation.
- Increase flow/return temperatures.
- Lighting controls.
- Check your LZCs.

HOARE LEA


60
50
40
30
20
10
0
Heating (MWh)
Boiler
Heatpump
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Nov-17
Dec-17
Jan-18
Feb-18

HOARE LEA

2. Replace what’s inefficient.

More than just central plant.

- Pumps and fans can be big savers.
- Lighting is always a good one.
- Localised hot water (and even cooling).
- Temper the person, not the space.

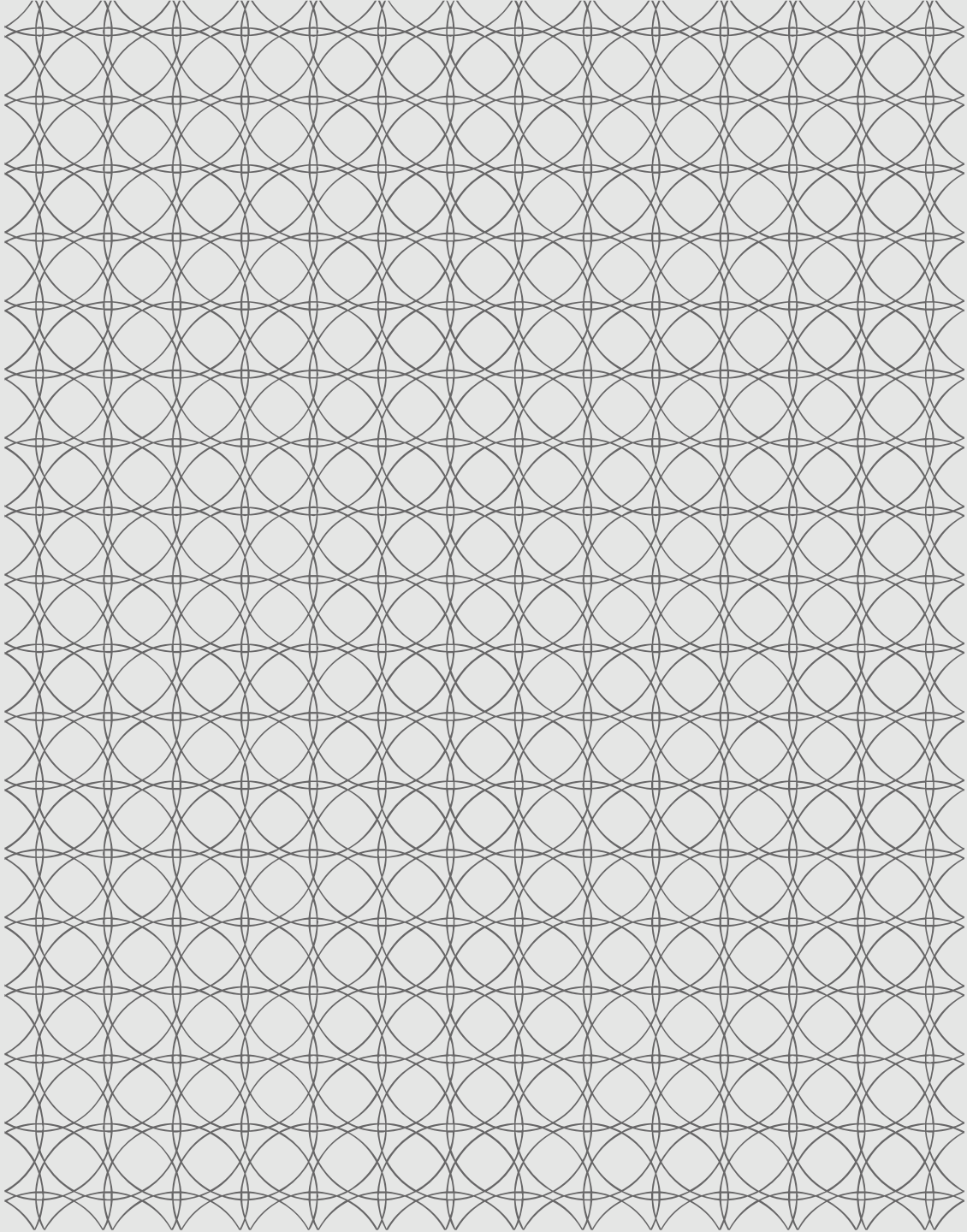
HOARE LEA

3. Reduce what you need.
Fabric & function.

- Insulation levels.
- Glazing.
- Cold bridges.
- Shading.
- Relocating desks.
- Remote working.
- Cloud servers.

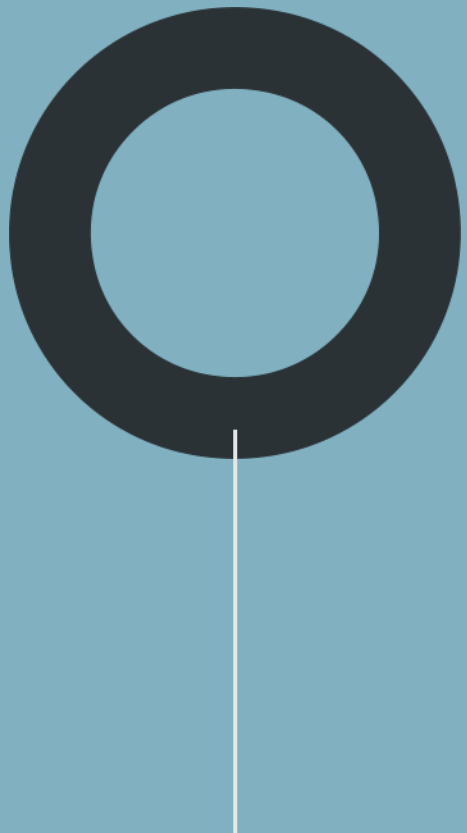
HOARE LEA

Combining the two.



HOARE LEA

Reducing the risk of COVID-19 transmission does not have to mean an increase in energy consumption.

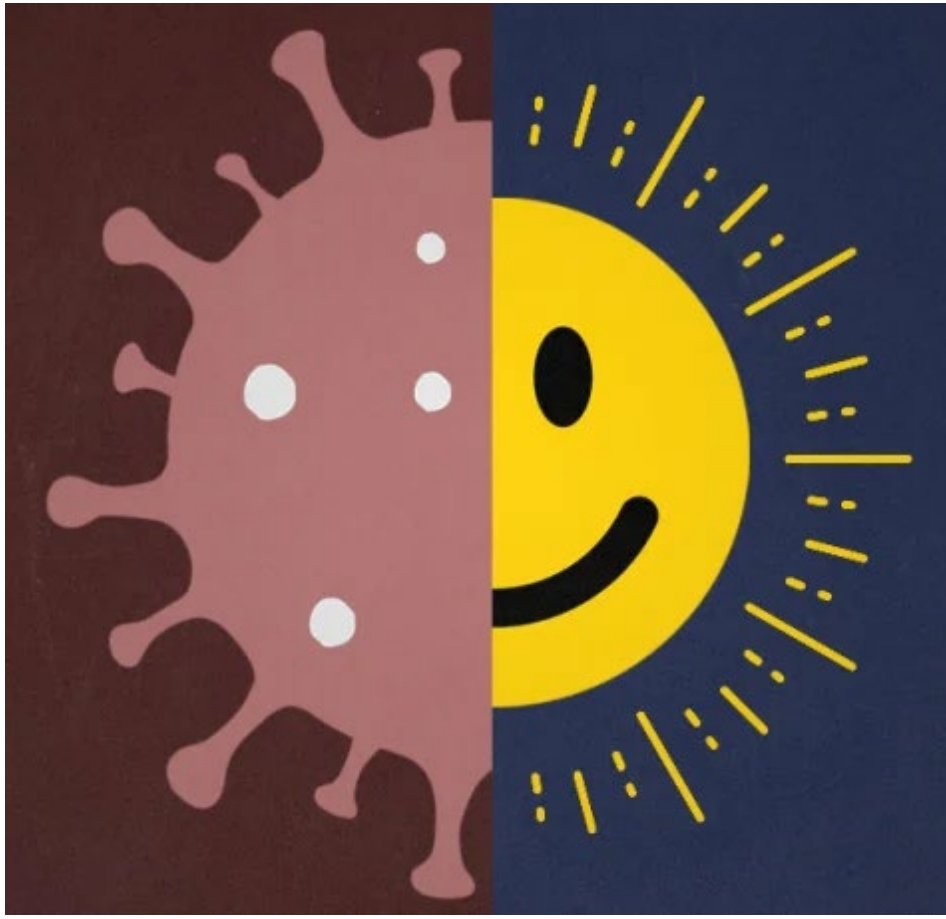


HOARE LEA

Less COVID-19 ≠ more energy.

In fact the opposite can be true.

- Revise time-clocks including optimised starts/stops.
- Demand controlled ventilation.
- Temper the person, not the space.
- Insulation levels.
- Shading.
- Relocating desks.
- Remote working.



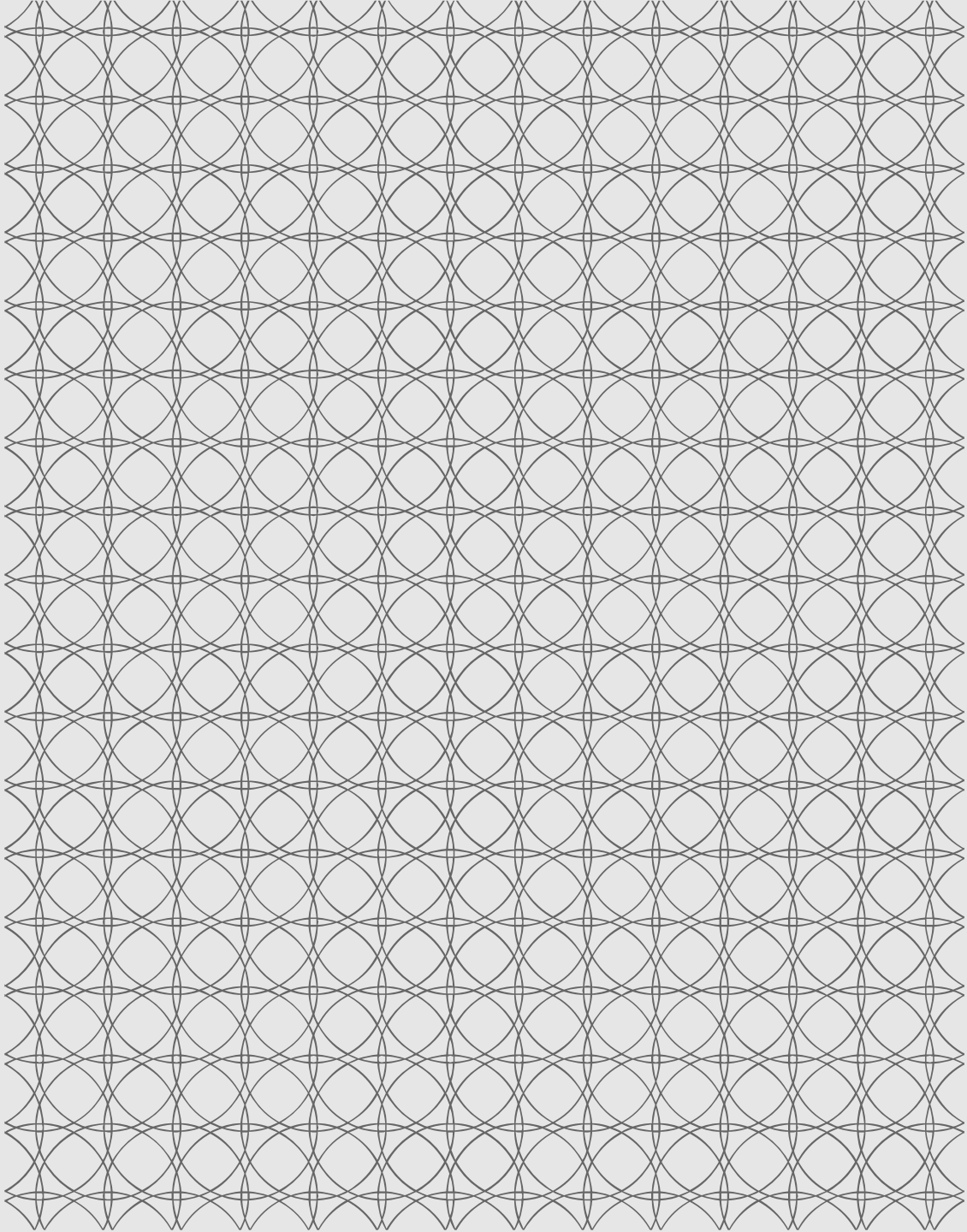
HOARE LEA

System.	COVID-19 Guidance.	Energy mitigation.
Natural ventilation.	Open as much as possible.	Use CO2 sensors.
Mechanical Ventilation.	Turn on 1hr before and after occupancy.	Make sure you know what your occupancy hours are.
Ventilation rates.	At least 10l/s/person or monitor CO2.	Use CO2 sensors.
Relative humidity.	Ideally at 40%-60% but it's not conclusive.	If you have implemented RH control, check your dehum. settings.
Recirculation	Turn off unless it is needed for fresh air supply or it is a single occupancy room.	No change.
Thermal wheel heat recovery.	If it runs on negative pressure differential, turn it off.	Reset your system so that it runs on positive pressure differential.
Duct cleaning and filters.	Be aware that filters and ducts may be contaminated.	No change.
Fan coil units.	Ensure low velocities, clean filters and extend run hours.	Make sure you know what your occupancy hours are.
"Air cleaners".	Not enough evidence that they work, ventilation is better.	No change.

HOARE LEA

Learning from industry.

Some experience.

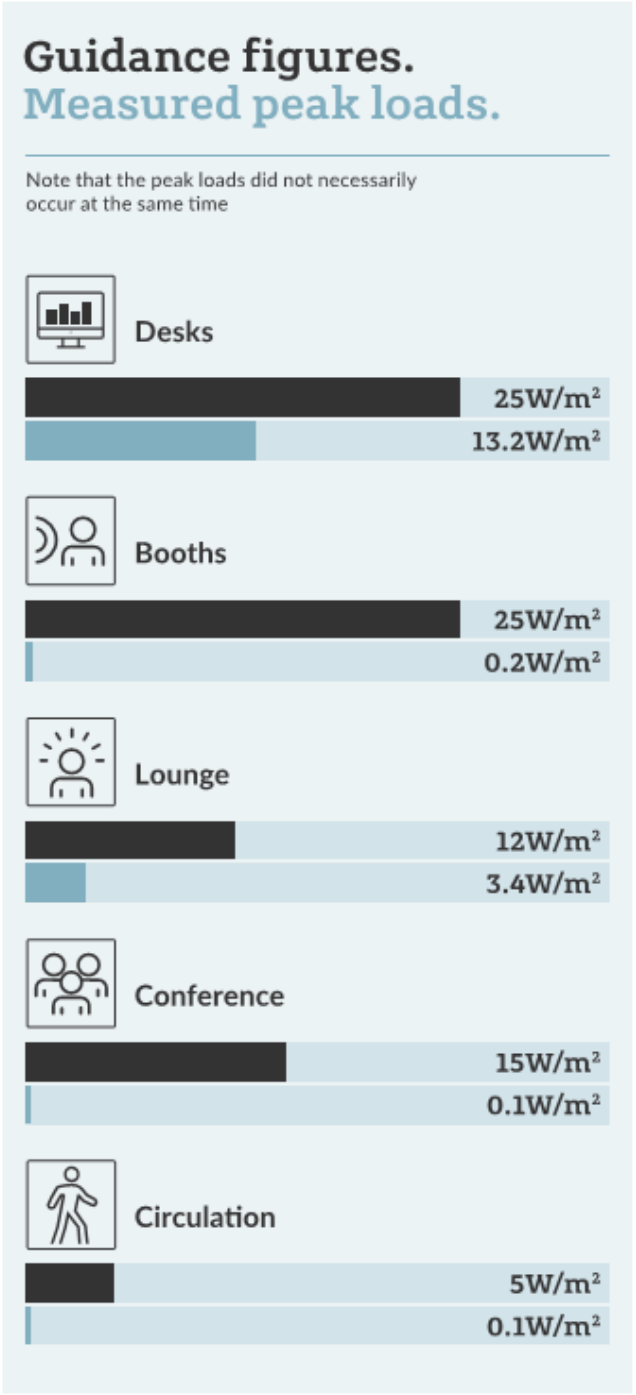


HOARE LEA

43%

Electricity needed.

- Servers & comms rooms were the biggest consumers.
- Conference / meeting rooms used a lot less than expected.
- Requested peak power from the grid was too high.



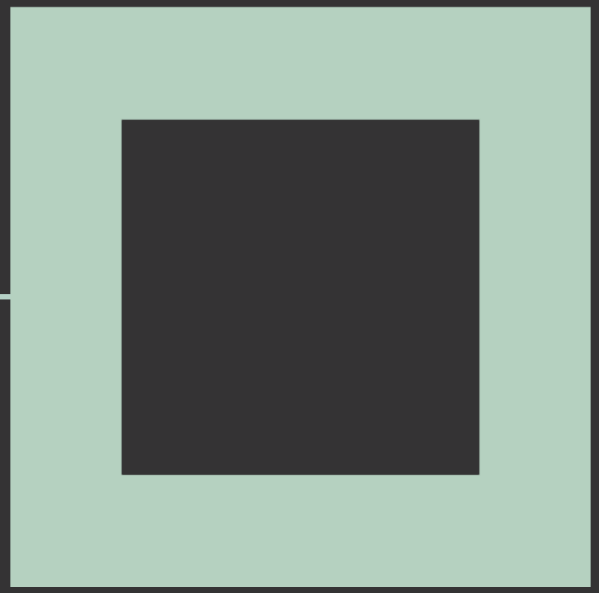
HOARE LEA

OUES.

Across 26 buildings.

- Reduced 1.3tCO2 annually purely by optimisation.
- Payback 1.45 years.

HOARE LEA



Thank you.
hoarelea.com