

# Road to Solar A47 Story 2022 – Now



**A47** Improvements

NORFOLK

North Tuddenham

A47

Norwich

Thickthorn roundabout

Blofield

A47

Great Yarmouth

A146



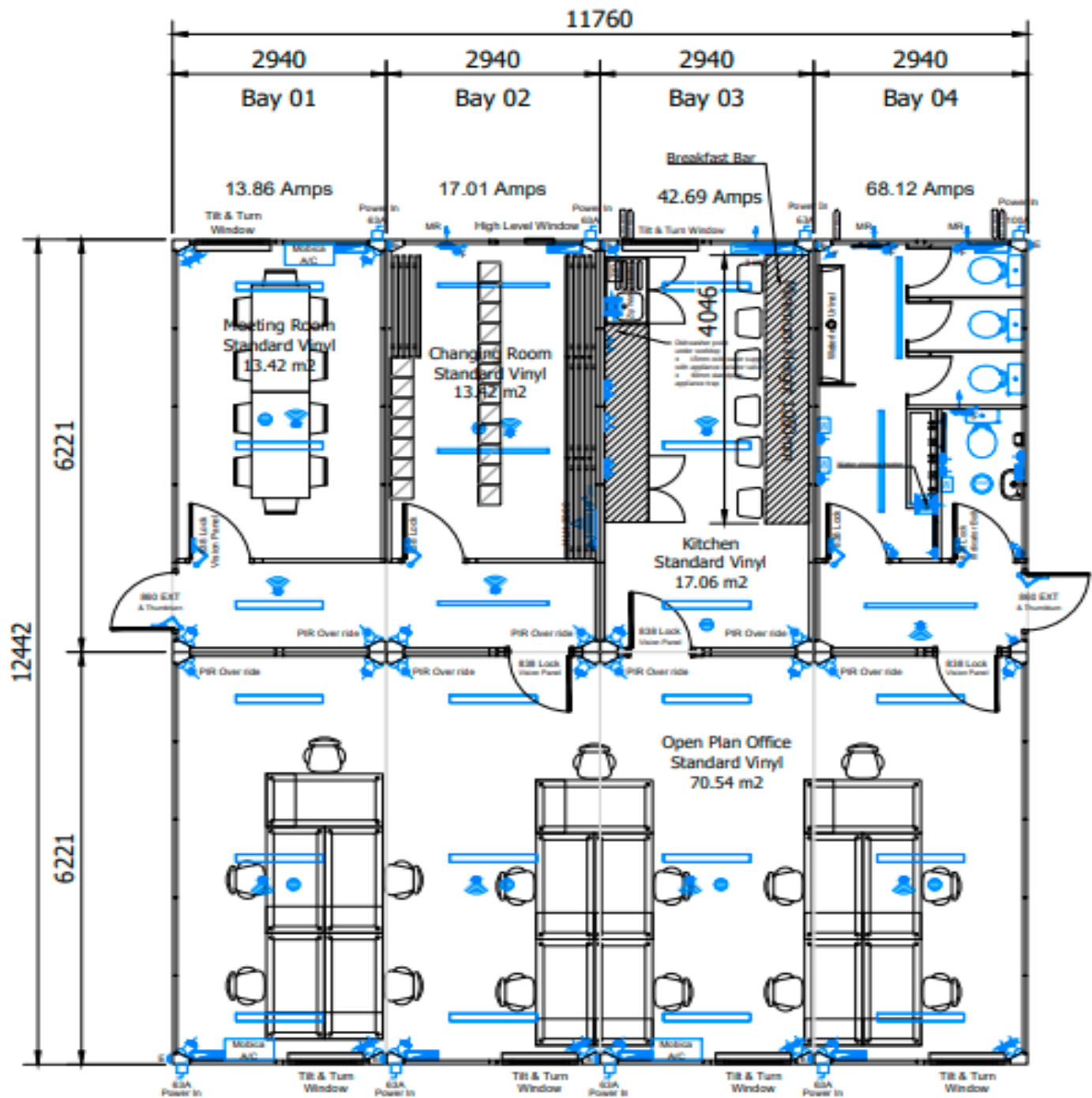
How the revamped A47 between Blofield and North Burlingham would look, according to National Highways (Image: Highways England)



SOLAR



MOBIKA



# Smart Technology

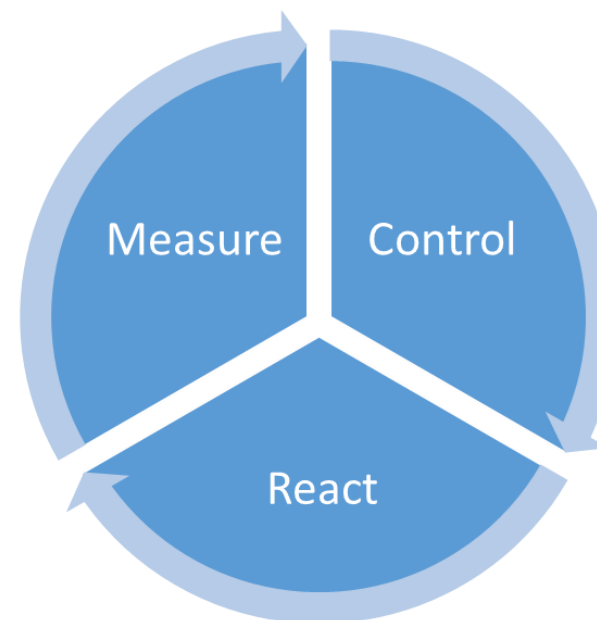
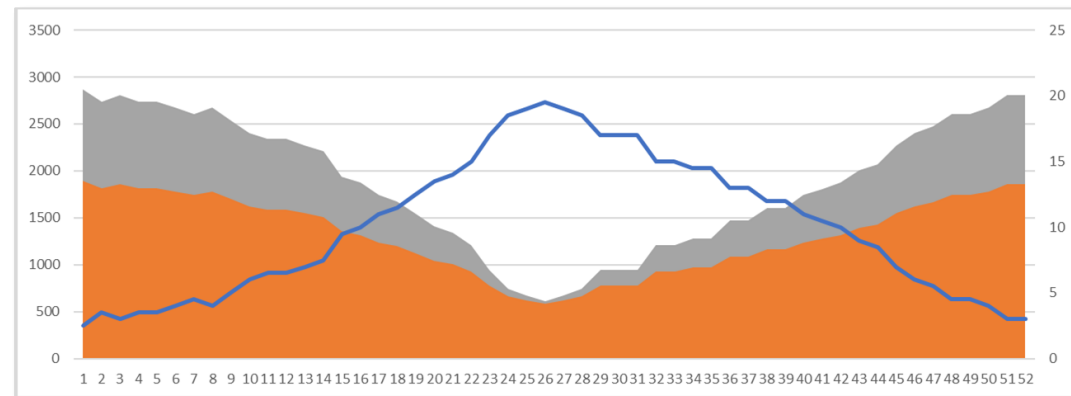
**Our core smart solution, integrated into the building for measurement control and reduction of energy consumption.**

## Smart building Control +

- Cost effective wireless monitoring and control platform for your site accommodation.
- Designed to reduce operating and management costs by measuring and controlling energy usage
- Reduces energy consumption by 20-30% by controlling and optimising heating, cooling & dehumidification availability.

## Smart Sockets

- Intelligent sockets that eliminate wasted energy within plug load
- provides you visibility, control, and automation over your devices.
- Reduces small power wasted energy by up to 50% which may account of 10-20% wasted energy on site.



# Occupancy Based Control to Reduce Energy Consumption



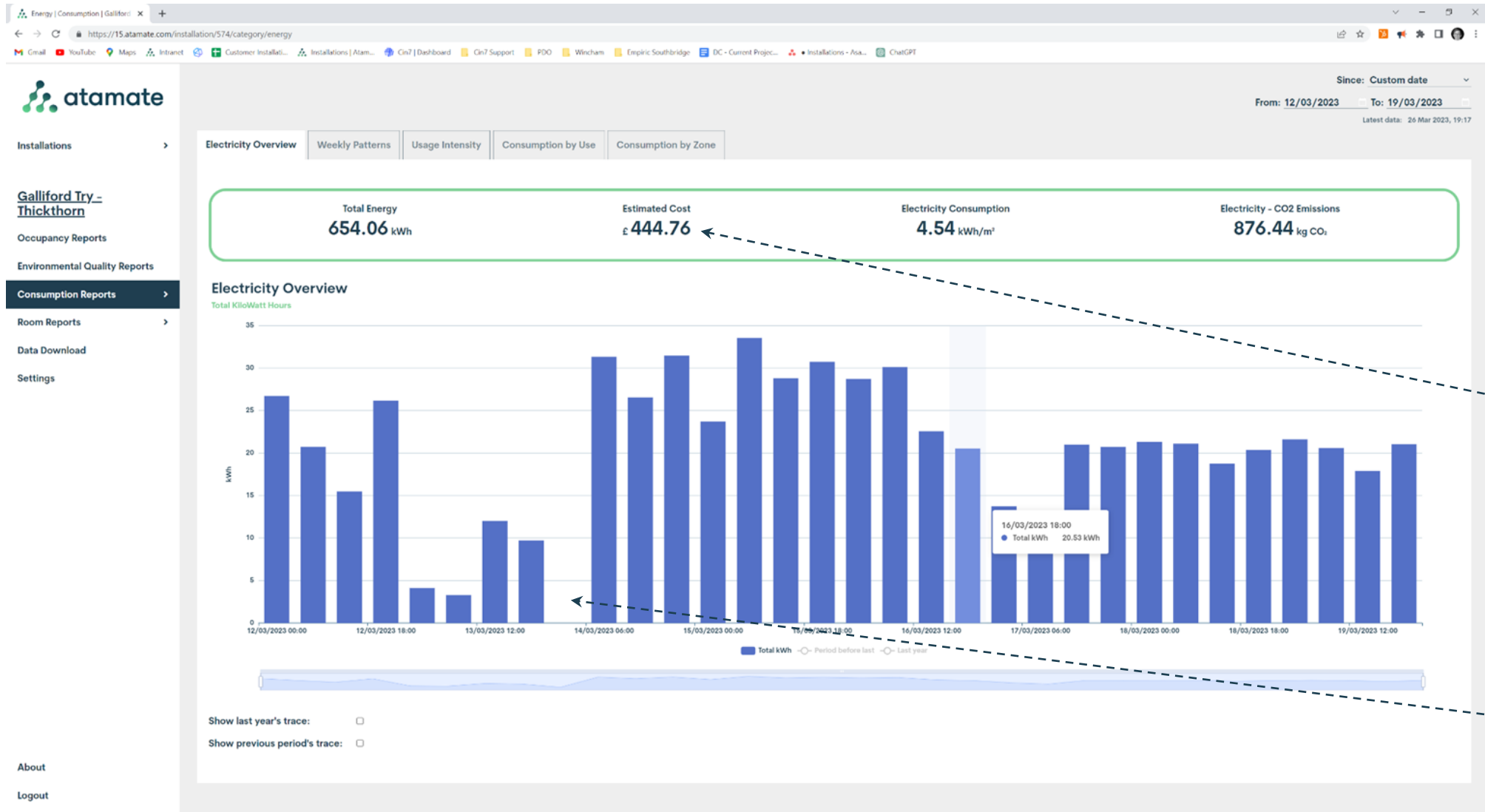
## Typical Functionality:

- Occupant linked heating
- Occupant linked lighting
- Occupant linked AC
- Ventilation based on Indoor Air Quality
- Boundaries imposed on space temperatures in zones

## Typical Performance:

- Occupancy based heating can lead to expected savings circa 25-30%
- System costs should allow payback against energy savings

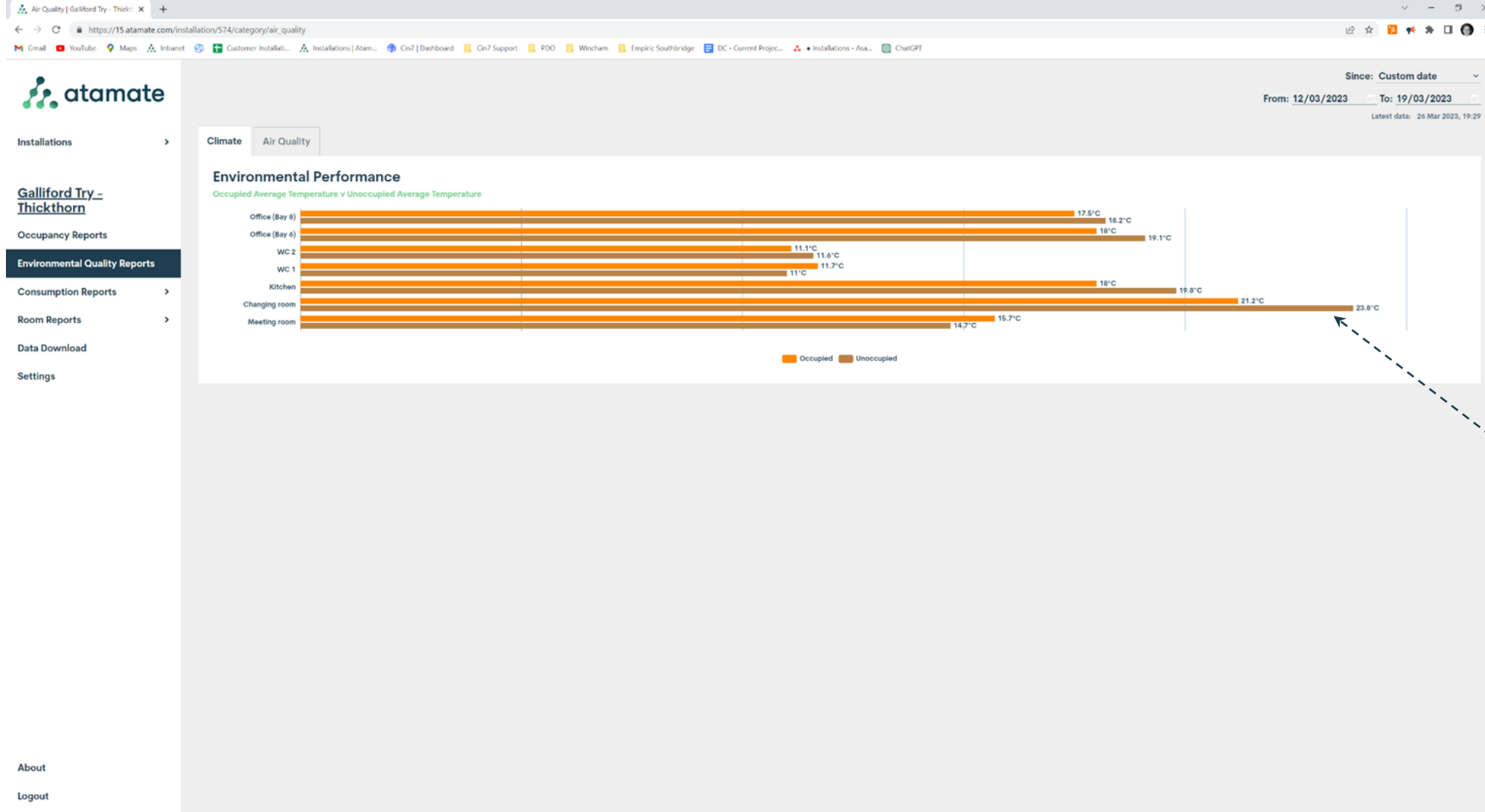
# Energy consumption overview - Monitoring only



This is the estimated energy cost for the week based on £1.70 per unit of diesel, it excludes any solar PV input

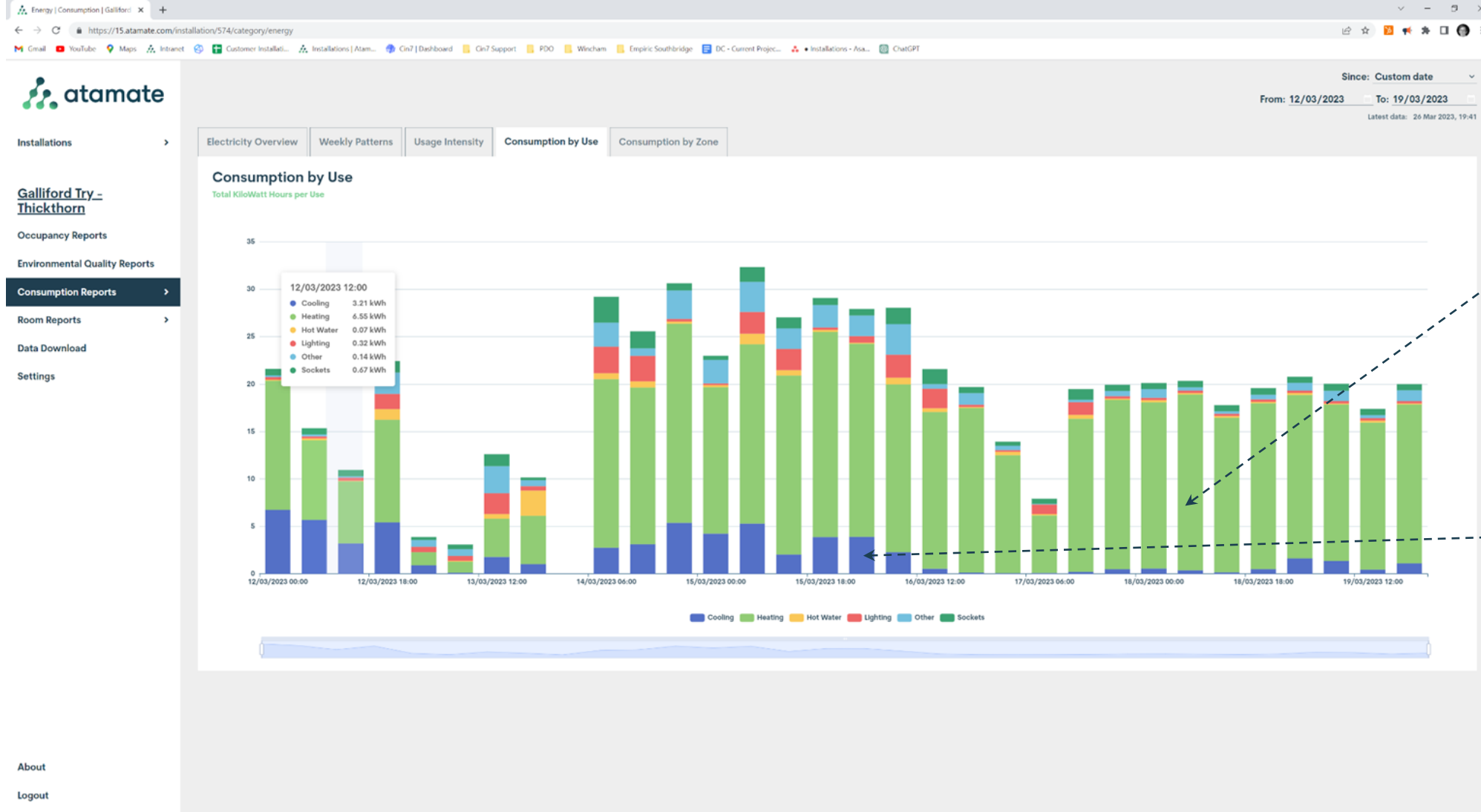
Gaps in data observed due to power outage

# System monitors temperature and occupancy for the same period



Temperatures are the same or higher when unoccupied. This indicates that the heaters are running out of hours

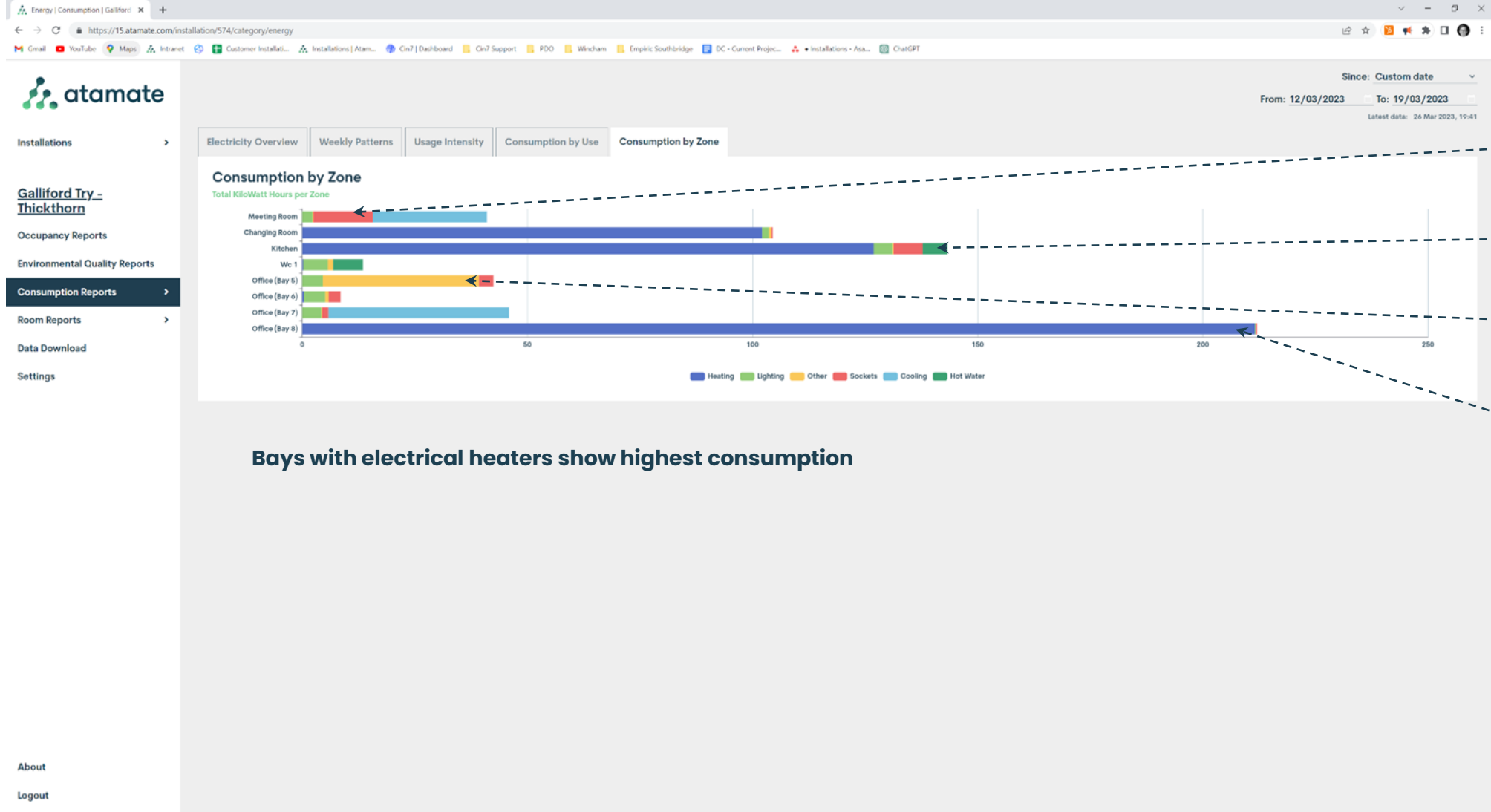
# Energy can be interrogated by use, heating is dominant



Green bars indicate large proportion of energy consumption due to electric heaters

Blue bars are energy consumption due to AC units, currently used in heating mode

# Energy can be interrogated by use, heating is dominant



High socket consumption in meeting room likely due to data rack

In kitchen, sockets and hot water consumption significant

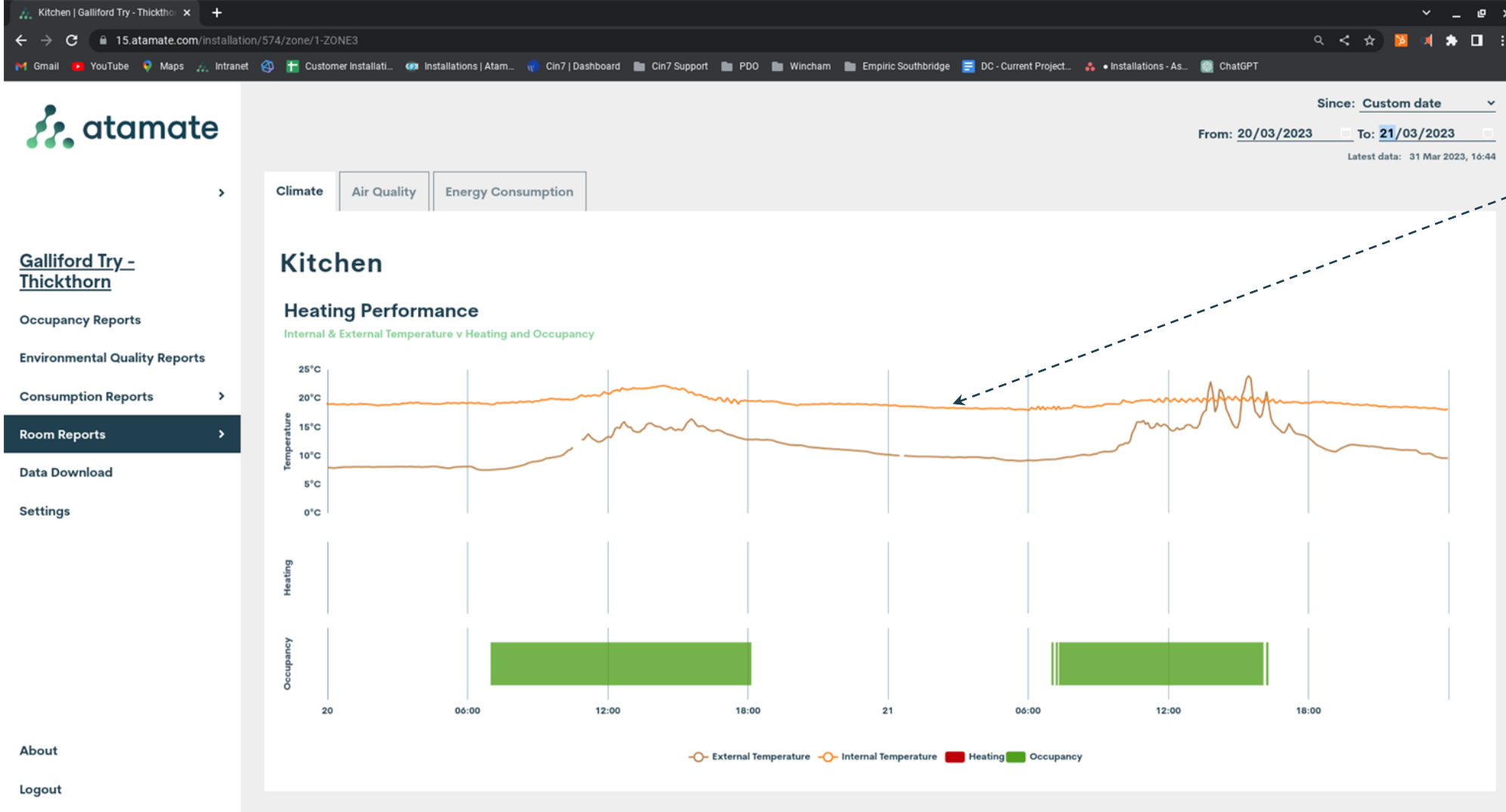
Yellow bar in bay 5 is mis-labelled AC unit

High energy consumption in bay 8 due to electrical heating

**Bays with electrical heaters show highest consumption**



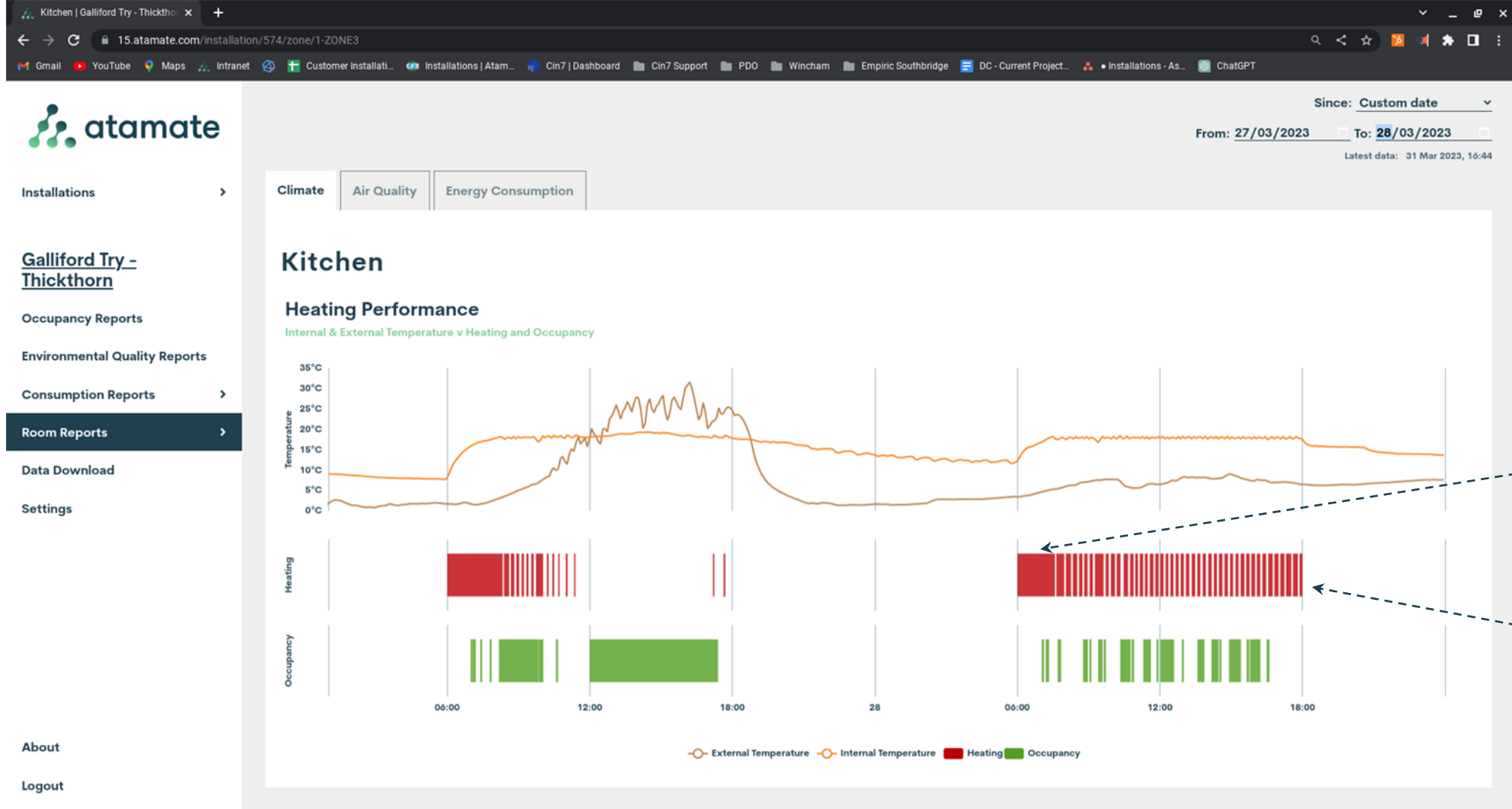
# Typical temperatures in kitchen over 24 hours without control



No set back observed either at weekends or overnight

This contributes to high heating energy consumption in the building

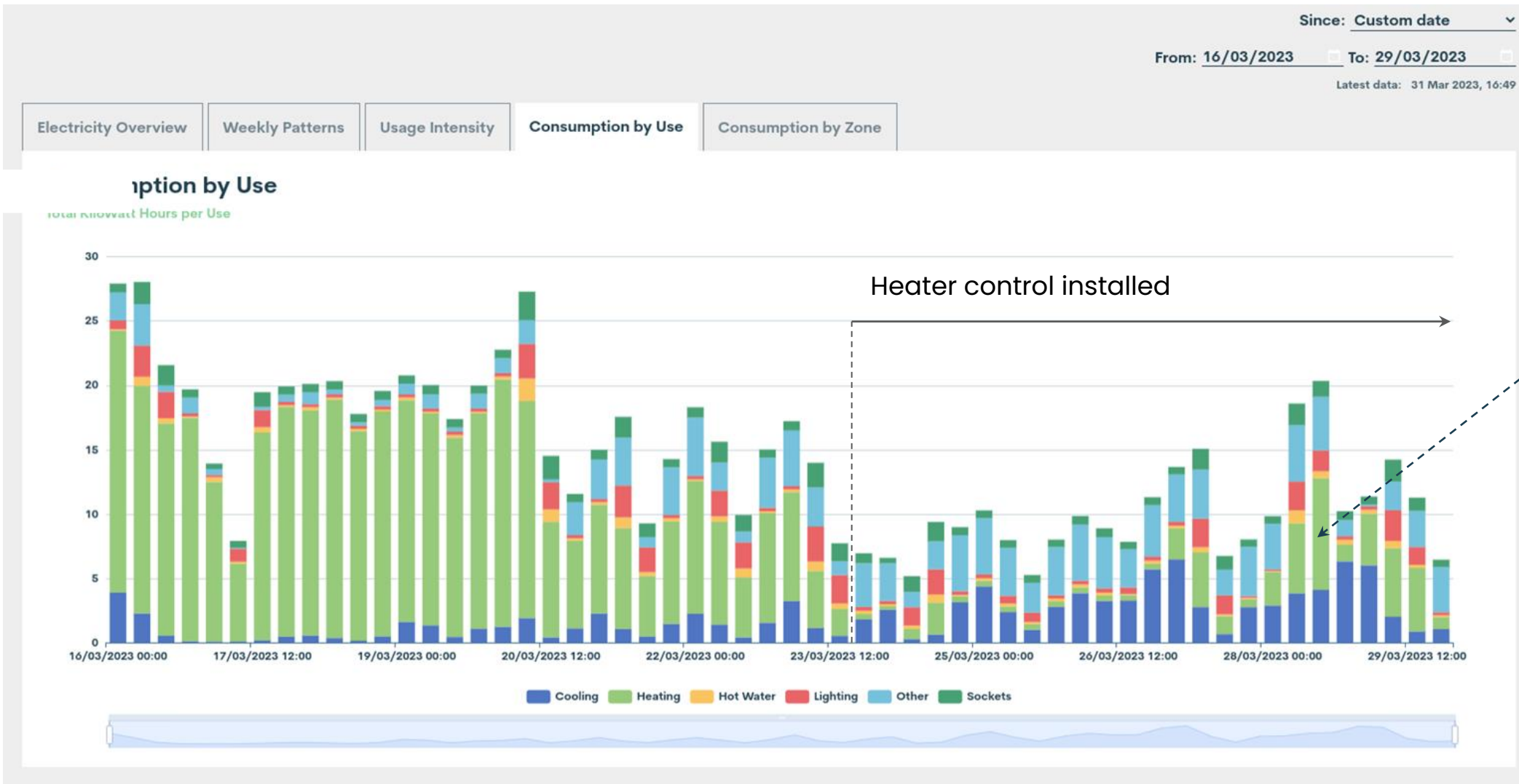
# Typical temperatures in kitchen over 24 hours with control



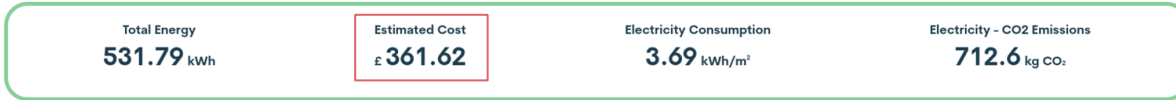
Morning warm up period

Heating only active when building is operating

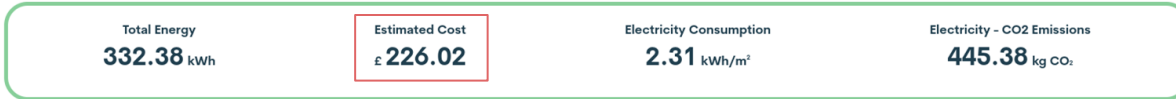
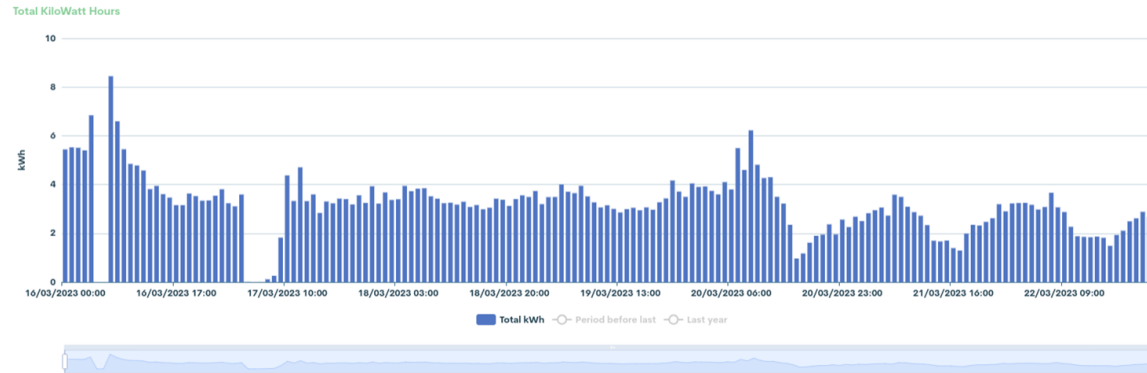
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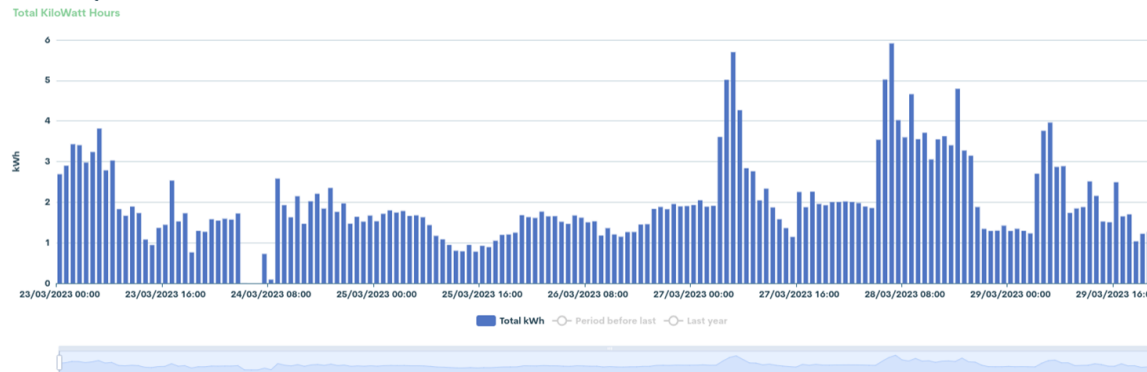
# Energy consumption comparison, pre and post control



## Electricity Overview



## Electricity Overview



- Charts opposite show energy consumption for the week before and after control was installed to electric heating
- Savings observed were circa 35%

# Battery data April at Norwich pre installation of solar

## Breakdown of Savings in Engine Hours and Fuel



Fuel costs saved

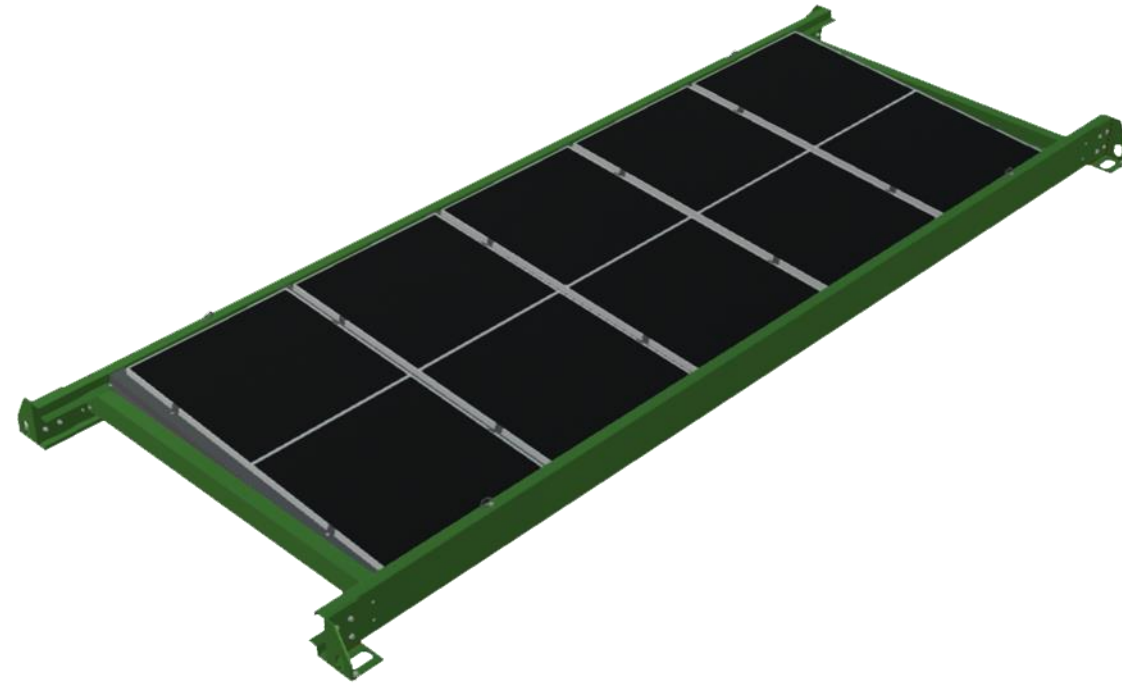
£ 4,611.73

CO<sub>2</sub> savings

7609.35 kg

## SOLAR

- Interim installed at Thickthorn in the final stages of development with our long term solution
- Interim solution is based on connection to hybrid and generator set, our long term solution will allow for a grid based solution
- Preinstalled set of solar panels on a frame installed on the roof of the units.
- Economic, Fives panels per frame generate around 2200 Wp for each. Projected yield per roof of c 1800 kWh per annum based on 5 degree pitch 0-20% shading and southern elevation

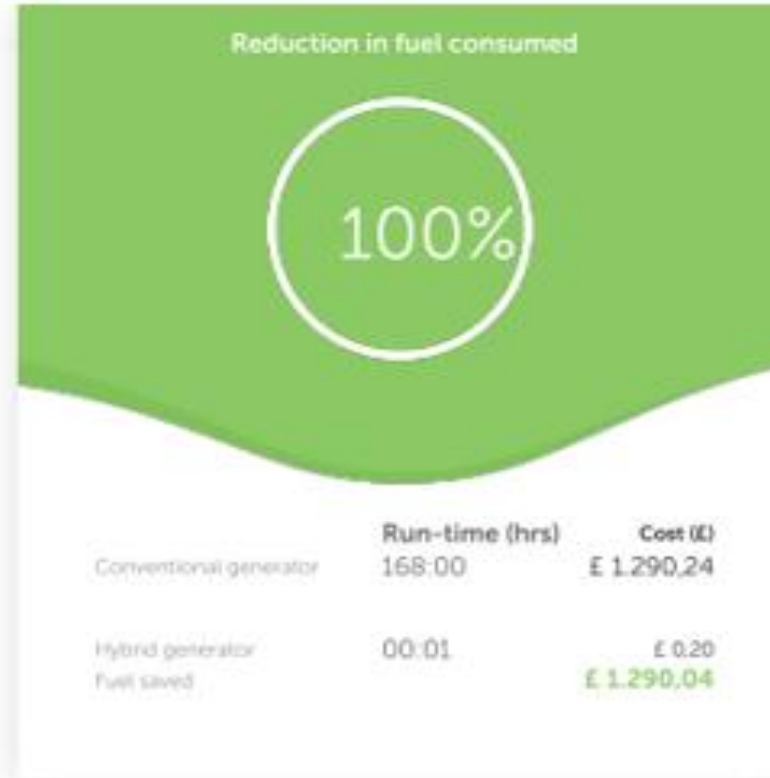


### Composition

Standard steel frame with 5% slope to facilitate rain water flow, fixation brackets, 5 solar panels for a total of 2200 Wp, 5 Micro Inverter to convert DC to AC, an electric box in single-phase or three-phase and a local gateway.

# Battery data last 7 days at Norwich – Since solar

## Breakdown of Savings in Engine Hours and Fuel



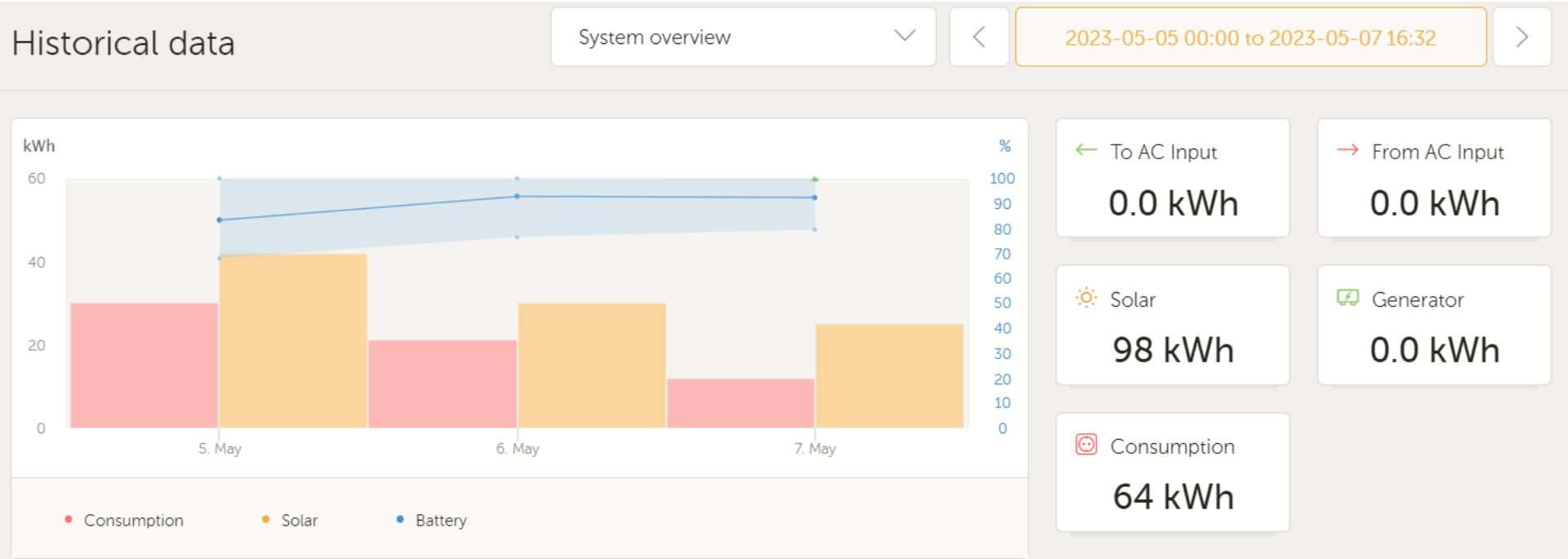
Fuel costs saved

£ 1,290.04

CO<sub>2</sub> savings

2128.57 kg

# Battery at Norwich over the bank holiday weekend



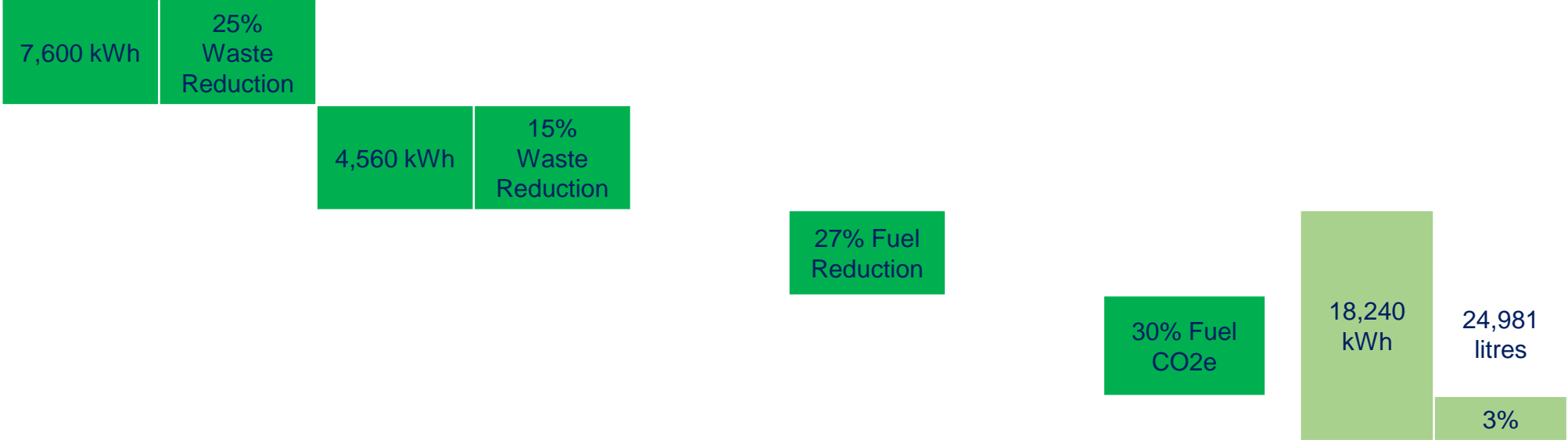
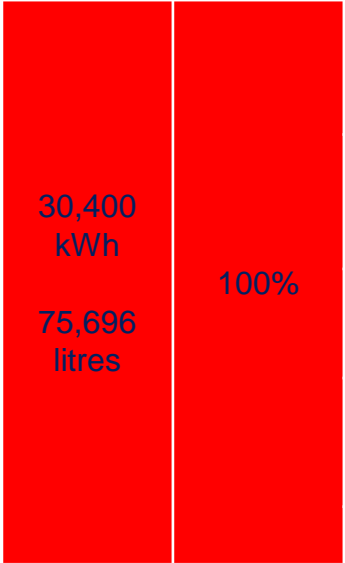
Solar unit produced 98kw  
Site only required 64kw  
Excess would have been used to keep the battery topped up  
Generator has worked ½ hour since 28/04



<b>8 Bay Building</b>	
Energy Usage	CO2e

<b>Smart Energy Control+</b> (modelled at 25% reduction)		<b>Smart Sockets</b> (modelled at 15% reduction)		<b>Hybrid Generator Set</b> (modelled at 45% fuel reduction)		<b>HVO Fuel</b> (modelled at 11% CO2e of diesel)	
Energy Saved	CO2e Saved	Energy Saved	CO2e Saved	Energy Saved	CO2e Saved	Energy Saved	CO2e Saved

<b>8 Bay Building with smart and sustainable technology</b>	
Energy Usage	CO2e



8 Bay Building	
Energy Usage	CO2e

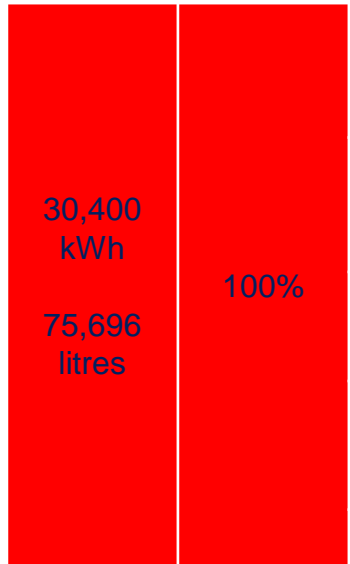
Smart Energy Control+		Smart Sockets	
(modelled at 25% reduction)		(modelled at 15% reduction)	
Energy Saved	CO2e Saved	Energy Saved	CO2e Saved

Solar now operational on site, with generator running less than an hour after two weeks!

An even greater reduction in CO2e!!!

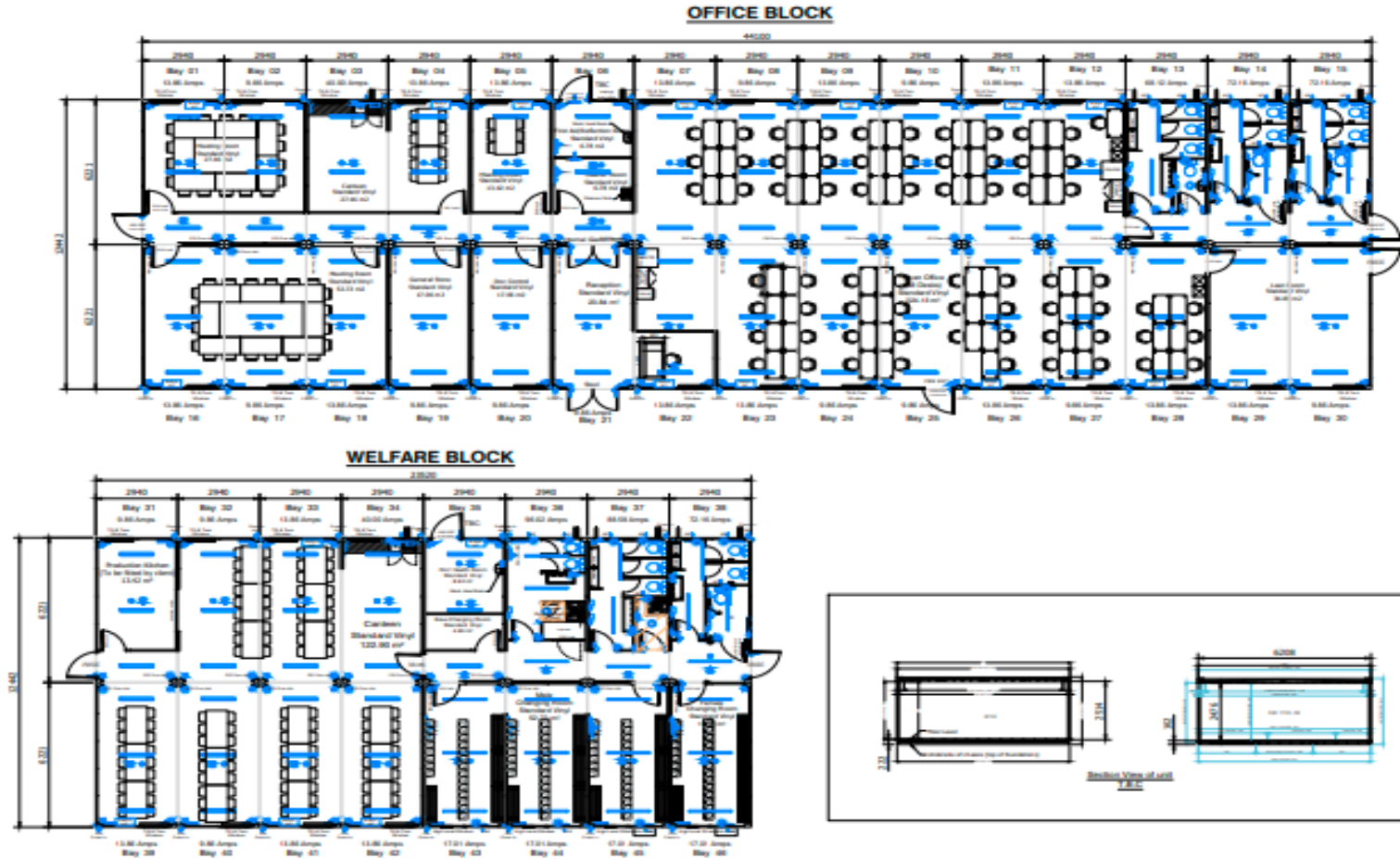
Potential to get to <1%?

Already saved 922 litres fuel... >£1,500 since end April.





# What's next – Blofield £500k



Furniture for illustration purposes only.  
Final lighting specification subject to visit allocation at the point of order.  
Subject to availability. Draft drawing only, final specification to be determined upon design freeze.



- **Tom Allen**
- **Ben Dale**
- **John Greig**
- **Atamate**
- **Measurable Energy**
- **ABird**

# Thank you

[algeco.co.uk](http://algeco.co.uk)

