SPACES Study Day 2023

Net Zero Starts With Energy Waste

Scarce Renewables

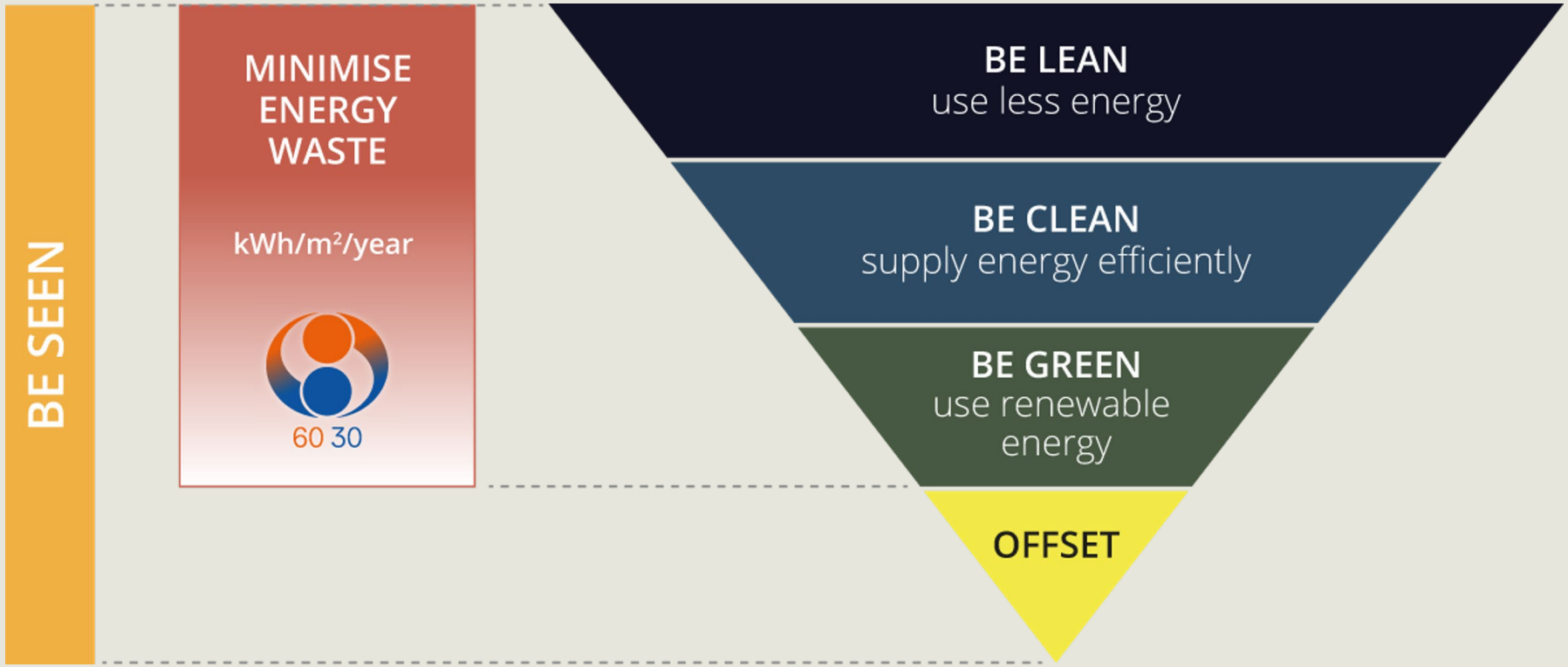
Renewables should be understood as the champagne of energy:

Scarce and expensive

EnergiRaven

How are we Wasting Energy?

Closing the Performance Gap



Our Greatest Untapped Energy Source

Danfoss Calls it the "Trillion-Dollar Opportunity"

Energy efficiency is the quickest and most affordable way to decarbonize our economy and ensure reliable and sustainable energy for everyone on the planet. Around **44% of the CO_2 emission reductions** needed to meet the Paris Agreement **can come from energy efficiency**, with another **36% from a switch to renewables** (IEA 2017). The bottom line is that without efficiency, the potential of renewables alone for a sustainable energy transition is insufficient.

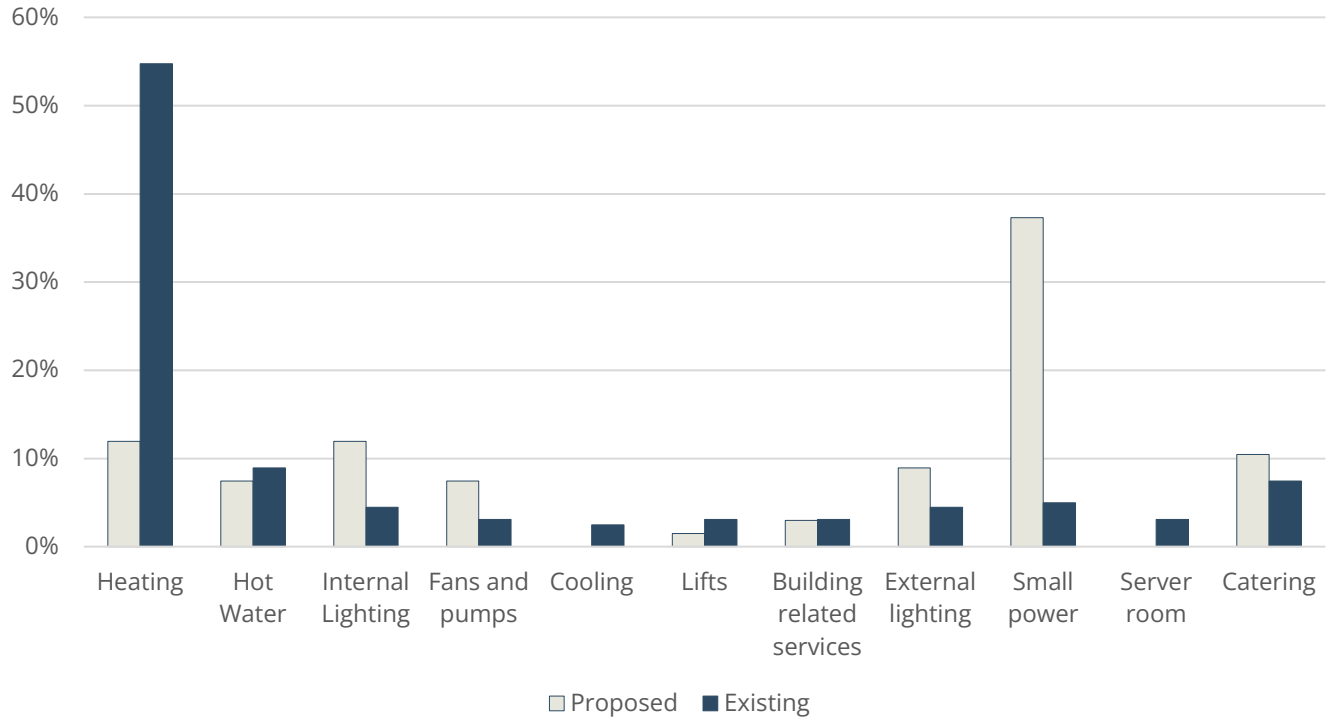
Therefore, it makes a lot of sense to go for energy efficient solutions to tackle the climate change emergency.

Source: Insights for Tomorrow, Energy Efficiency

Start at the Beginning

School Energy Consumption

Where Are We Now?



Source: Building Energy Efficiency Survey: Education sector, 2014–15

	Existing	Goal
Combined (kWh/m²/year)	200	52 - 67
Heating (kWh/m²/year)	110	8

Note: DfE split indicative

Striking a Balance

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Heating

The aim of regulating a heating system is to distribute the water in such a way that individual emitters receive the precise amount of heat that they require.

Ventilation

The aim of regulating a ventilation system is to achieve optimum indoor air quality with minimum energy waste.

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Striking a Balance

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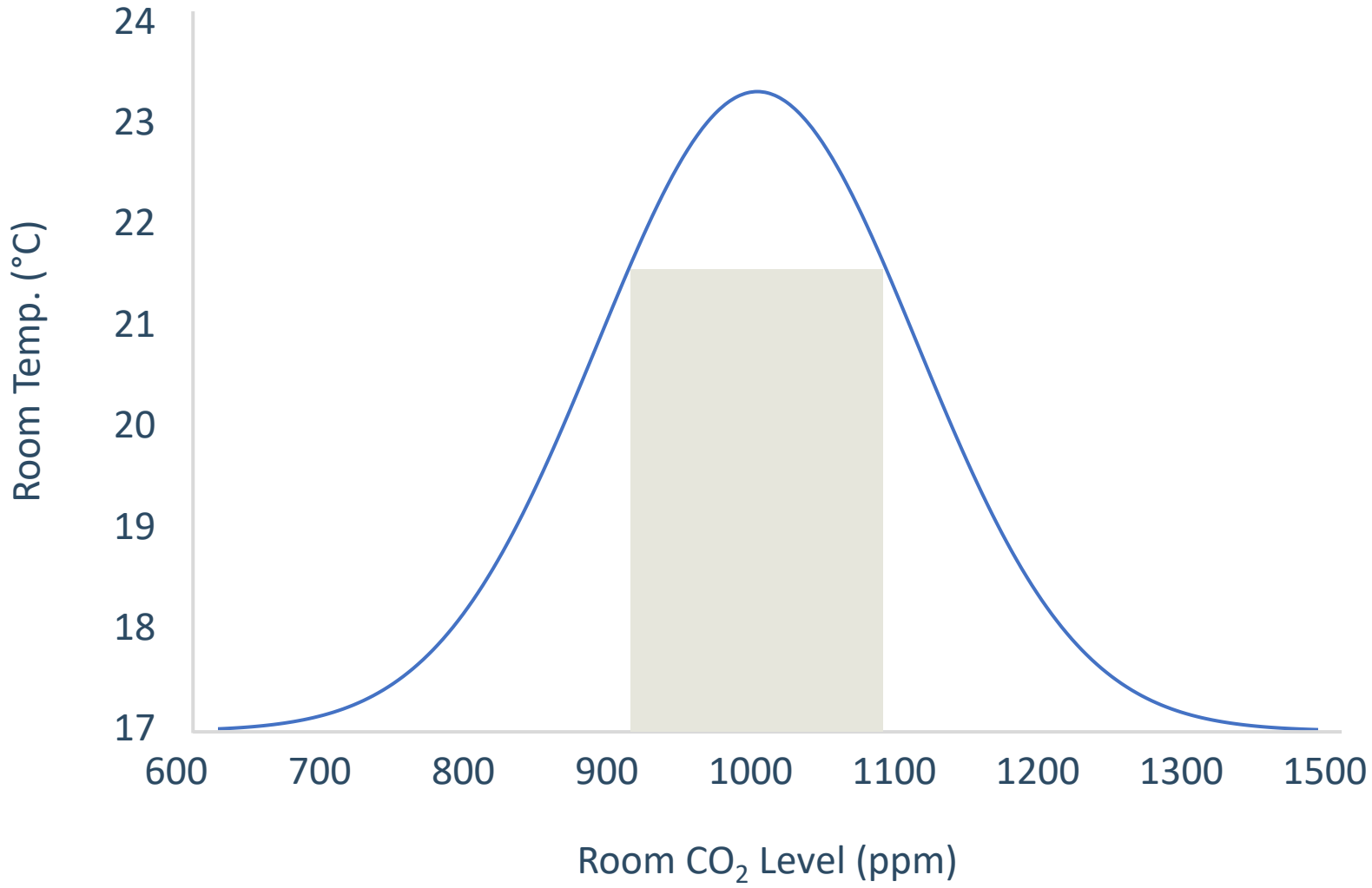

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Digitalising Building Energy Usage

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Key Utilities

3 meters x 8,760 hours =

26,280 annual meter readings

Automatic Meter Readings (AMR)

Wireless or Wired

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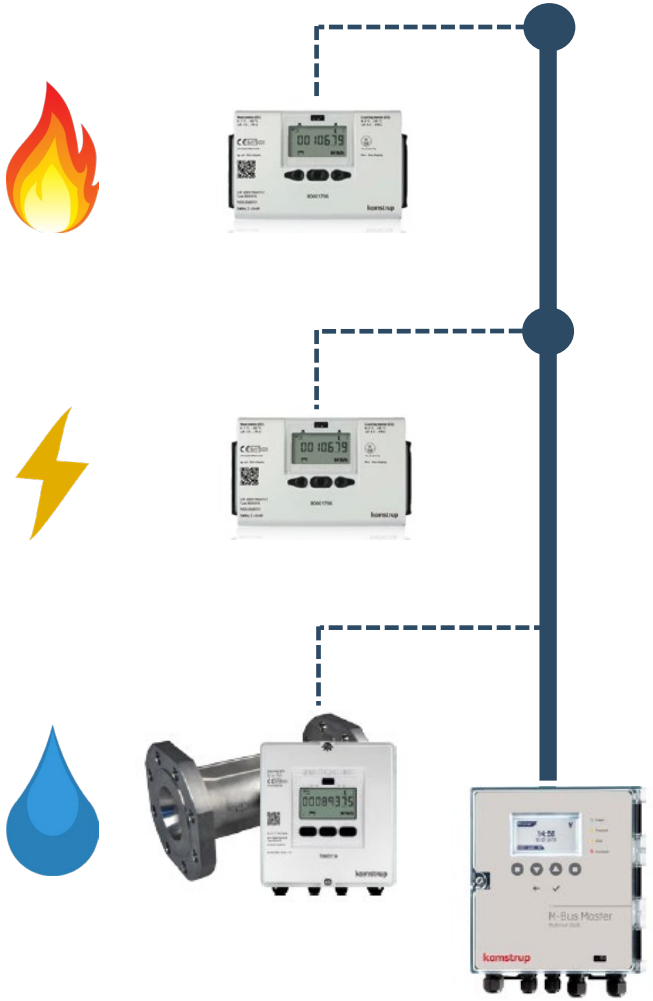
LoRaWAN



M-Bus

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Building Services Energy Monitoring System

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1998	Launch of MinEnergi – First internet-based Energy Accounting System in Denmark
2008	Acquired by OK a.m.b.a. and became a sister company to Kamstrup A/S
2015	MinEnergi 2.0 launched
2016	Established in Germany, EnergiData GmbH
2020	Head Office in Copenhagen, regional office in Aarhus and Duisburg (DE)
2022	EnergiRaven landed in the UK

Team of

40

employees

Monitor

65,000+

meters in myEnergiRaven

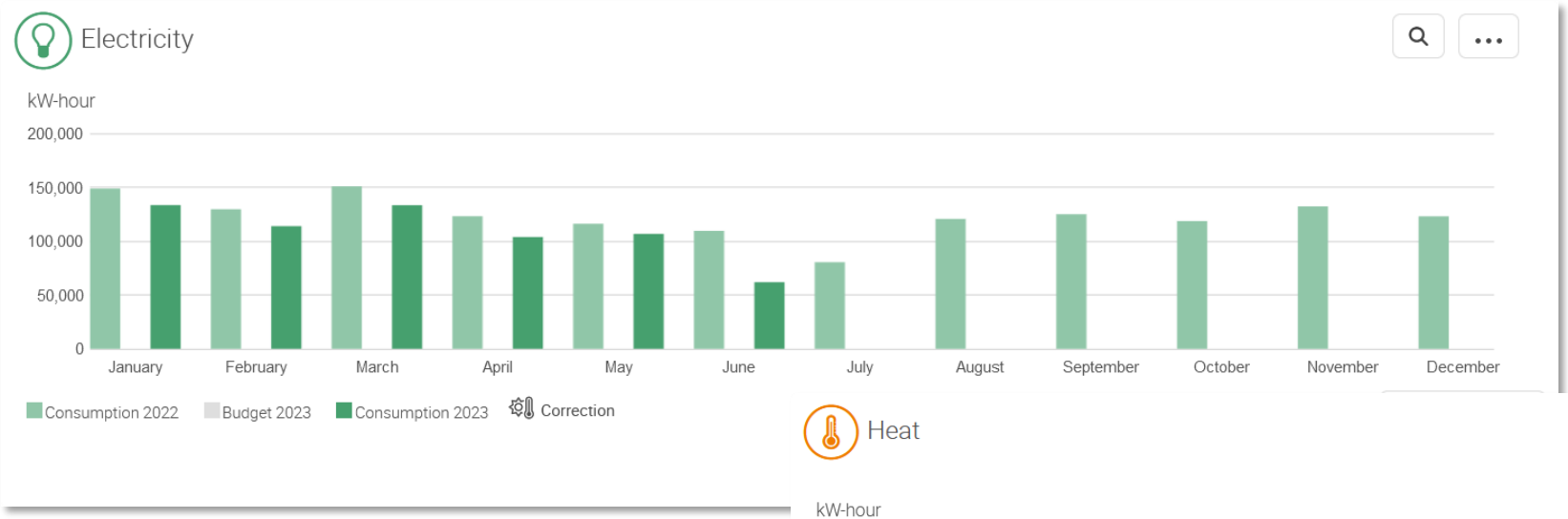
Monitor the energy consumption in

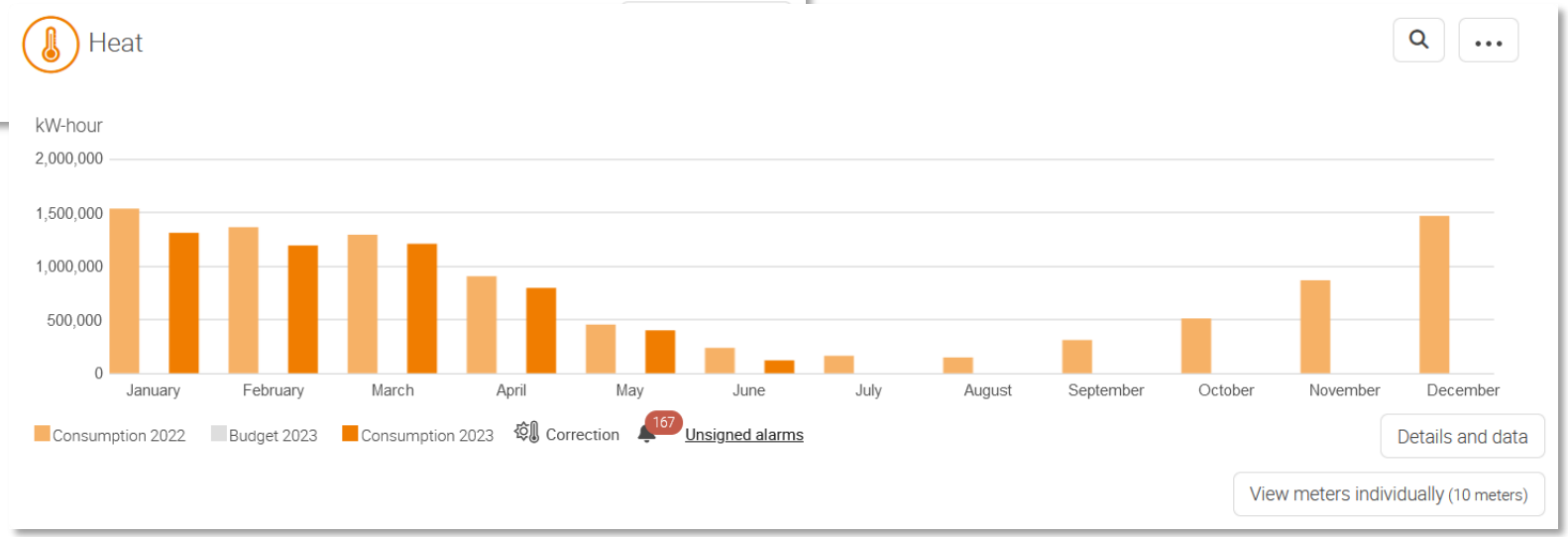
8,000+

buildings

Building Profile

Built Using AMR





Where to start?

Worst Performer

	Energy Intensity (kWh/m^2/year)		
	Heat	Electricity	Total
Meadowview Junior School	203	35	**238**
Primrose Valley Primary School	172	25	197
Willowbrook Infants School	136	24	160
Elmwood Manor College	133	24	157
Oakridge Grammar School	127	22	149
Beacon Hills Academy	119	20	139
Hillside Infants School	113	19	132

Heat demand is excessive at 203 kWh/m2 (85%)

Meadowview Junior School

Out of Hours Energy Waste

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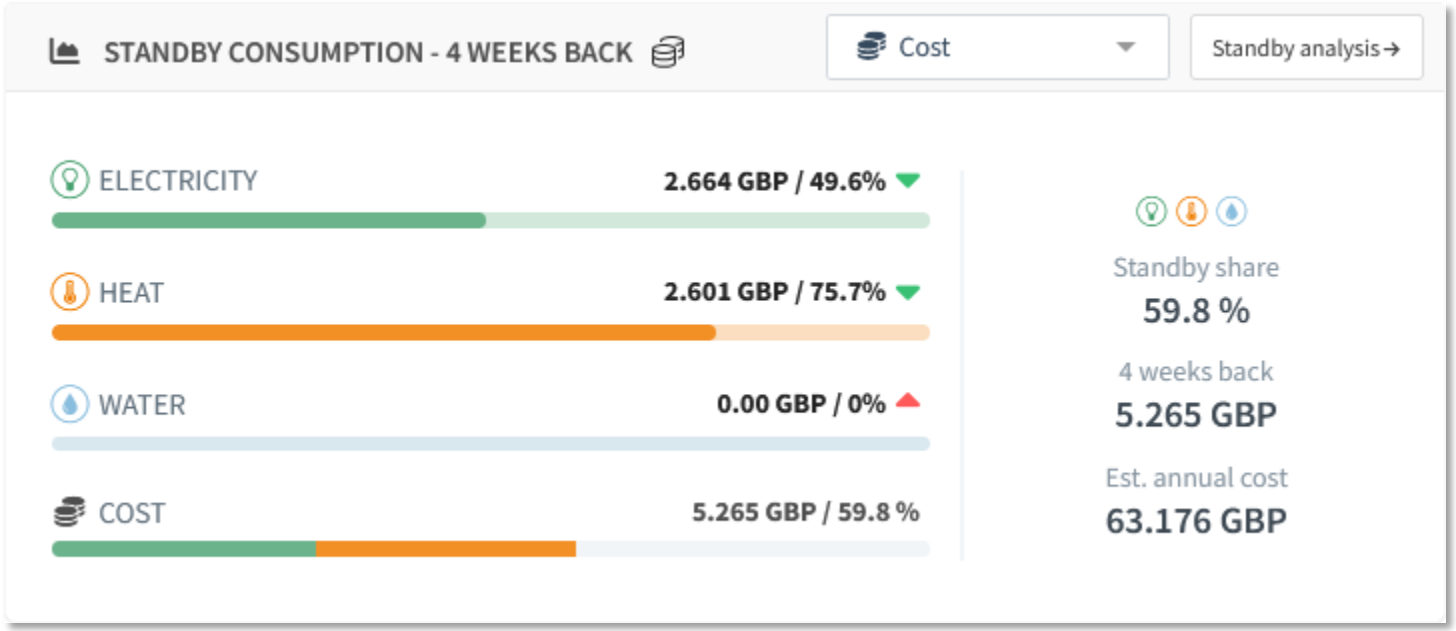

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Meadowview Junior School

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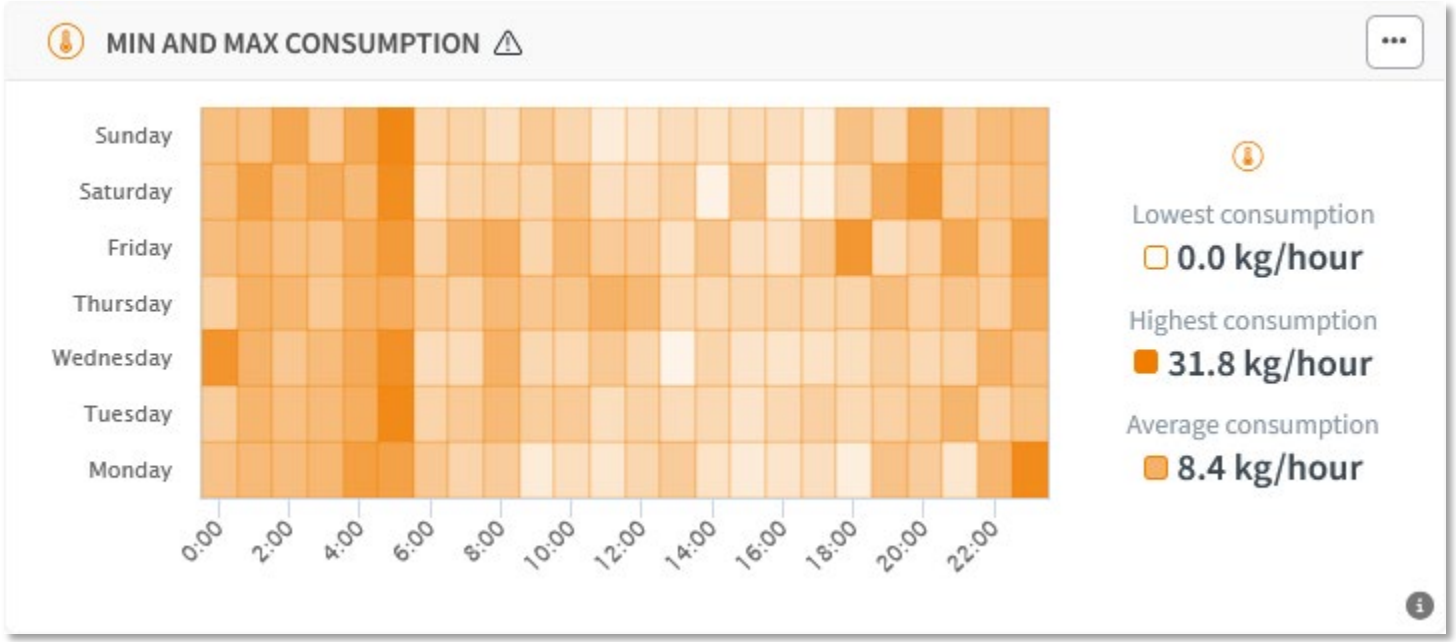
Is Your Heating System Under Control?



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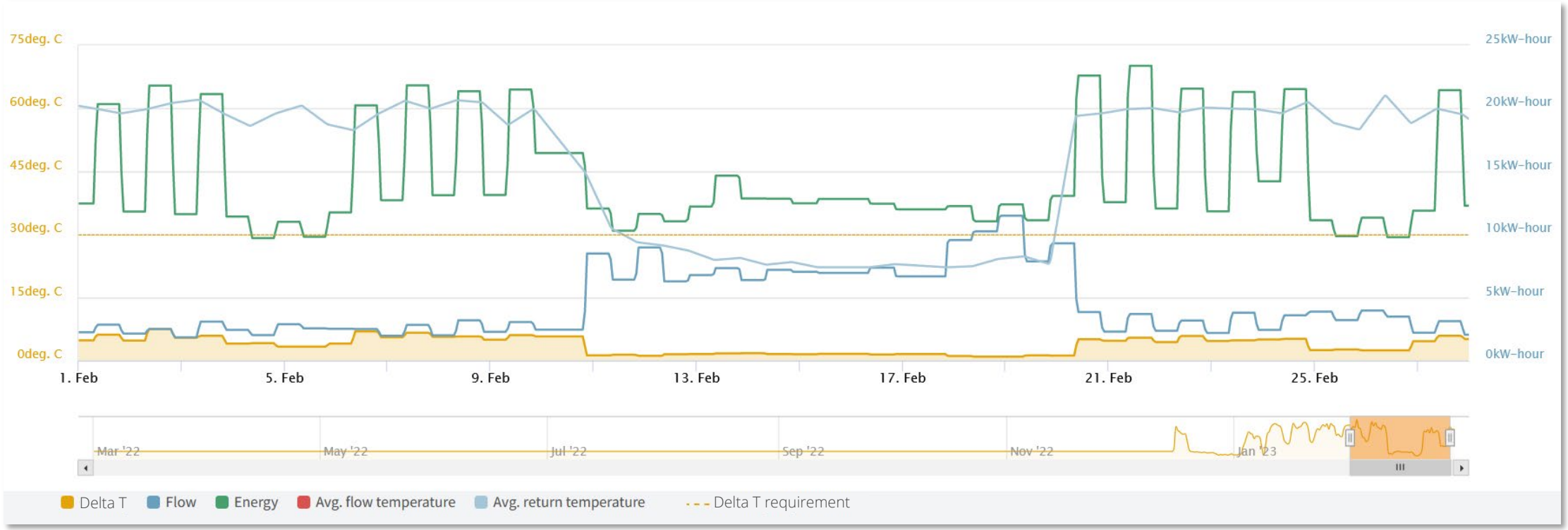
Meadowview Junior School

Plantroom Performance



Meadowview Junior School

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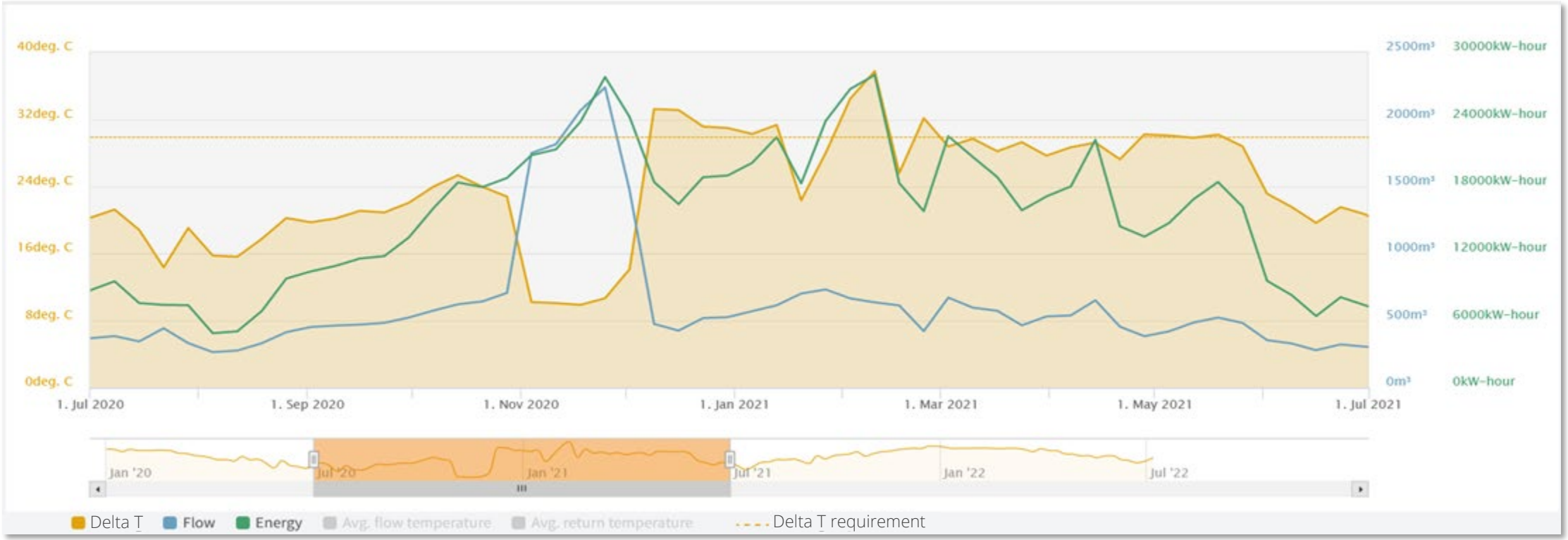
Tampering



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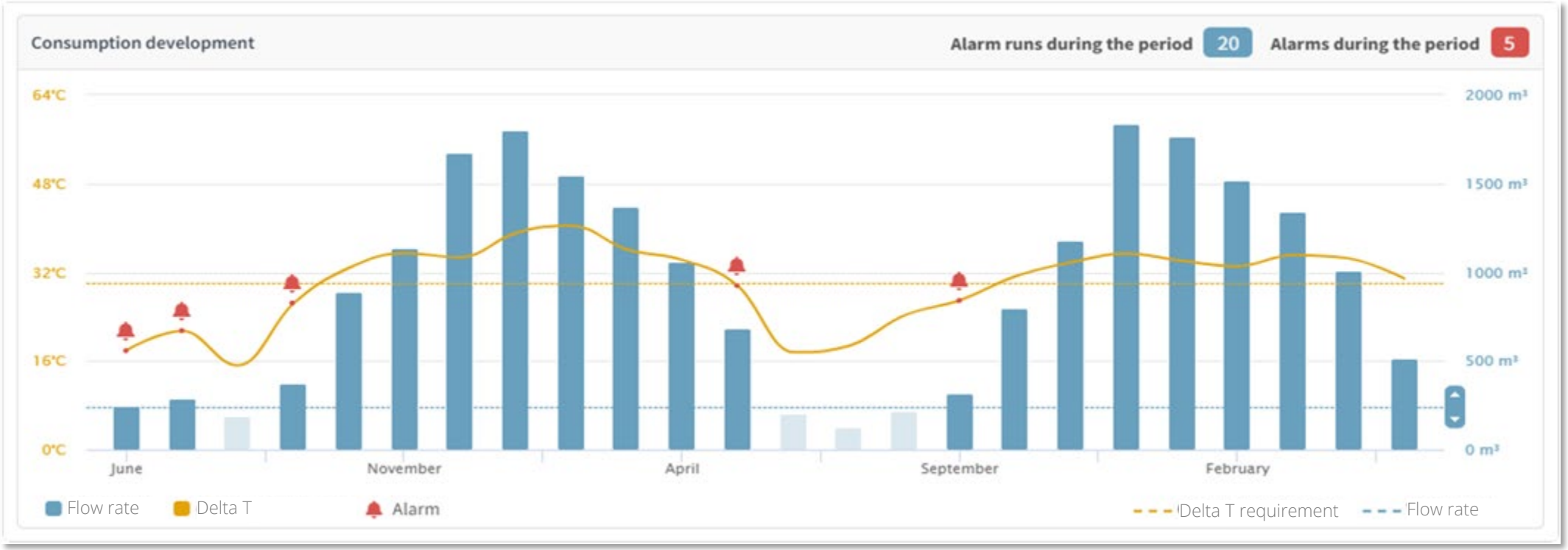
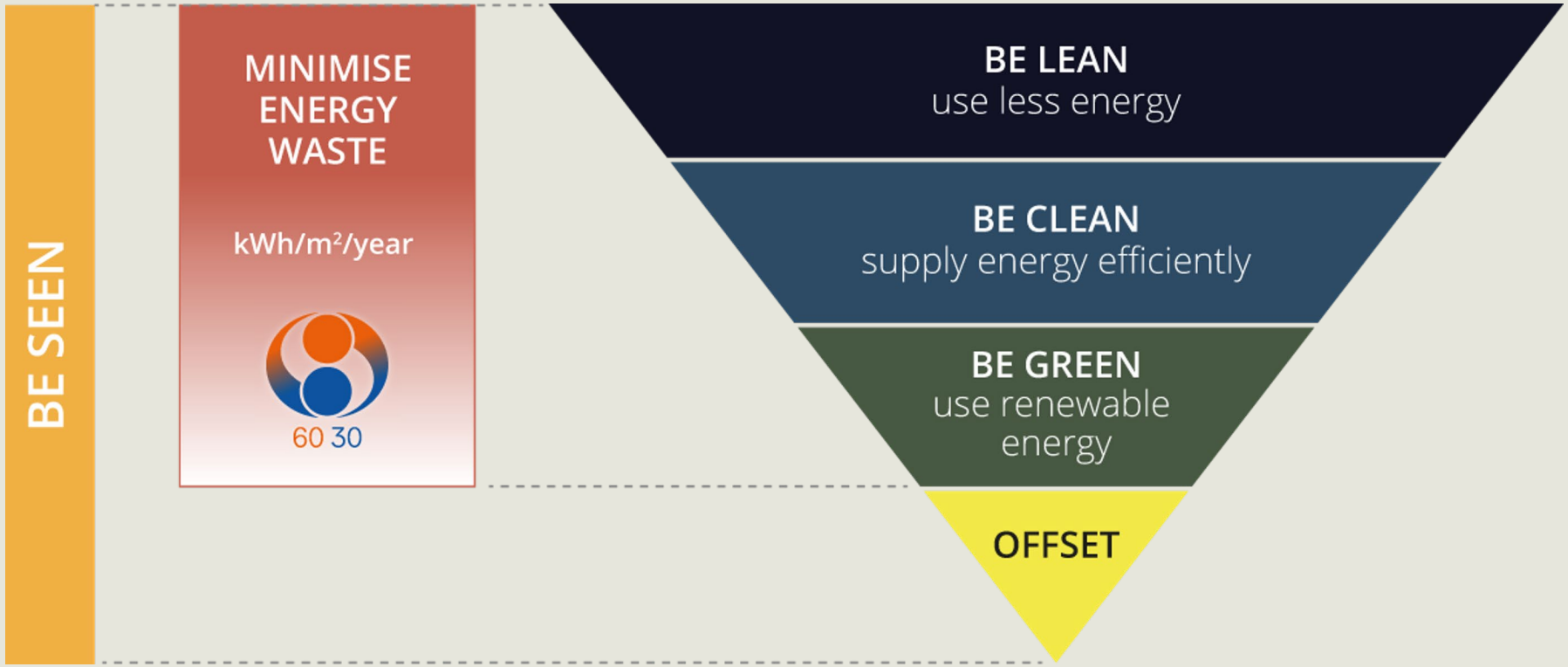
Meadowview Junior School

Optimising Heat Pump Performance



Closing the Performance Gap



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