Cambridge Carbon Footprint

OPEN eco HOMES

CAMBRIDGE RETROFIT HUB

Retrofitting for all budgets



29th September 2026

Funded by:

COBB COMMUNITY FOUNDATION

CAMBRIDGE CITY COUNCIL

South Cambridgeshire District Council

McCarthy Architectural Design
www.mccarthyarchitecturaldesign.co.uk

Mole

Ac

Agenda

7:00 PM

Welcome & Introduction

William Orme

Open Eco Homes

7:05 PM

Retrofit for all budgets

paul kershaw

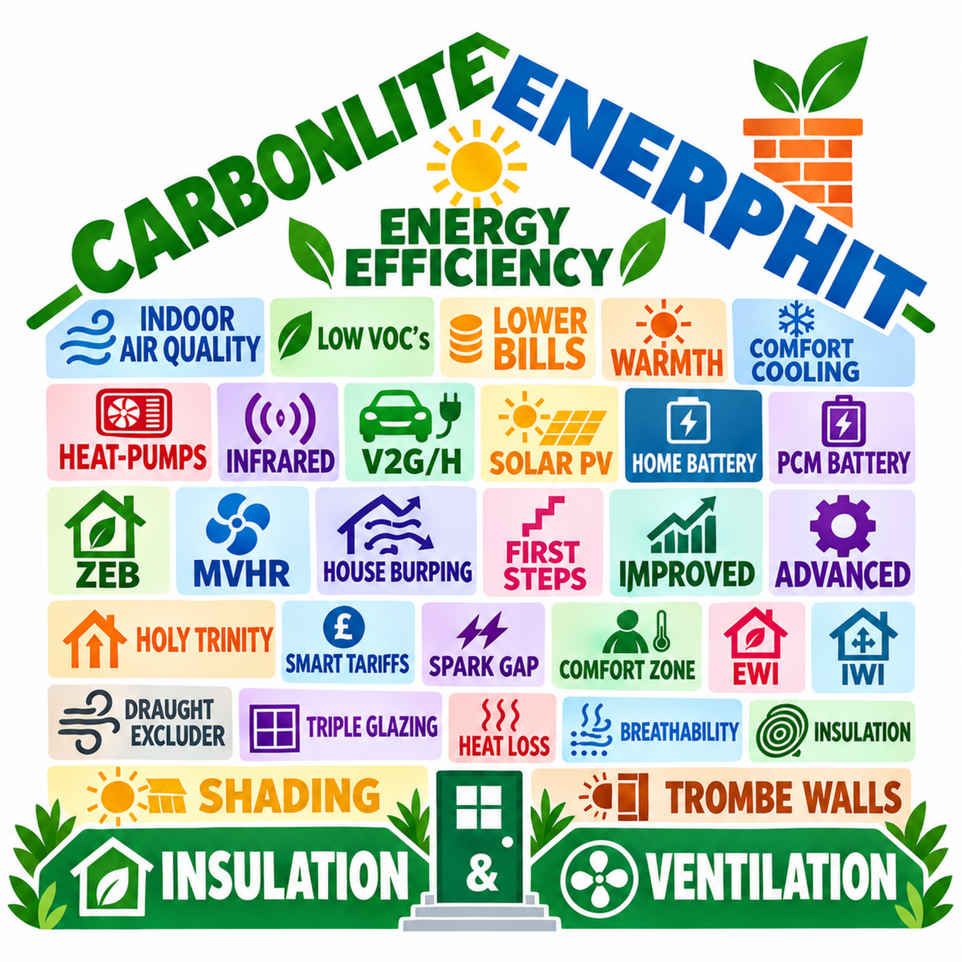
Cambridge Retrofit Hub

7:40 PM

Q&A Session

Lou Lancaster

Cambridge Retrofit Hub



Please put your questions into the chat

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Cambridge Retrofit Hub

CAMBRIDGE RETROFIT HUB

Cambridge's Not-For-Profit Retrofit, Home Energy Advice and Training Hub

Retrofit Cooperative and Community Benefit Society set up to empower residents and trades across the region to create healthier, more comfortable and greener homes. Our home energy advisors and retrofit training team can provide advice and skills training for renters, homeowners and trades; and our retrofit advisors, coordinators and designers can help you improve your home for greater energy efficiency and comfort.

QUAKERS

CAMBRIDGE CITY COUNCIL

South Cambridgeshire District Council

CAMBRIDGE RETROFIT HUB

Cambridge Retrofit Hub

Able-To-Pay Retrofit

- Homeowners
- Landlords
- Community Buildings
- Schools



Cambridge Retrofit Hub

Able-To-Pay Retrofit

- Homeowners
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- Community Energy schemes



Cambridge Retrofit Hub

Able-To-Pay Retrofit

- Homeowners
- Landlords
- Community Buildings
- Schools
- Community Energy schemes
- Presentations to communities and businesses



Cambridge Retrofit Hub

Able-To-Pay Retrofit

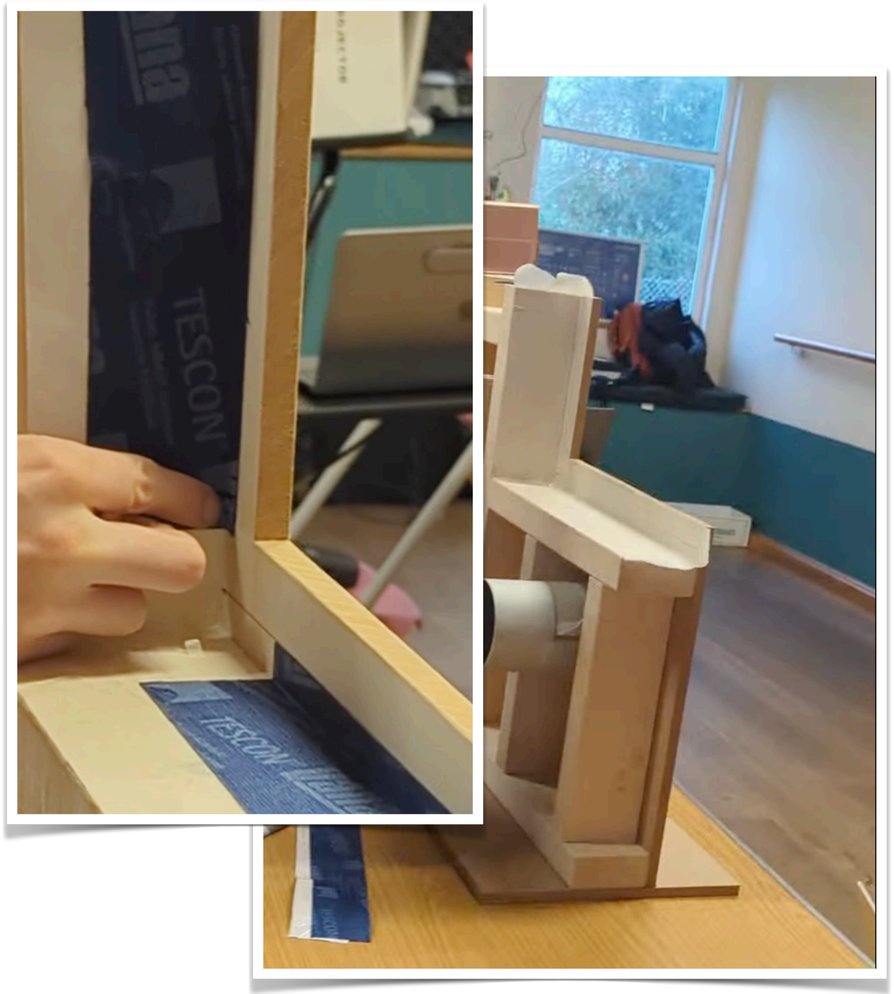
- Homeowners
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- Training workshops for DIYers and Trade



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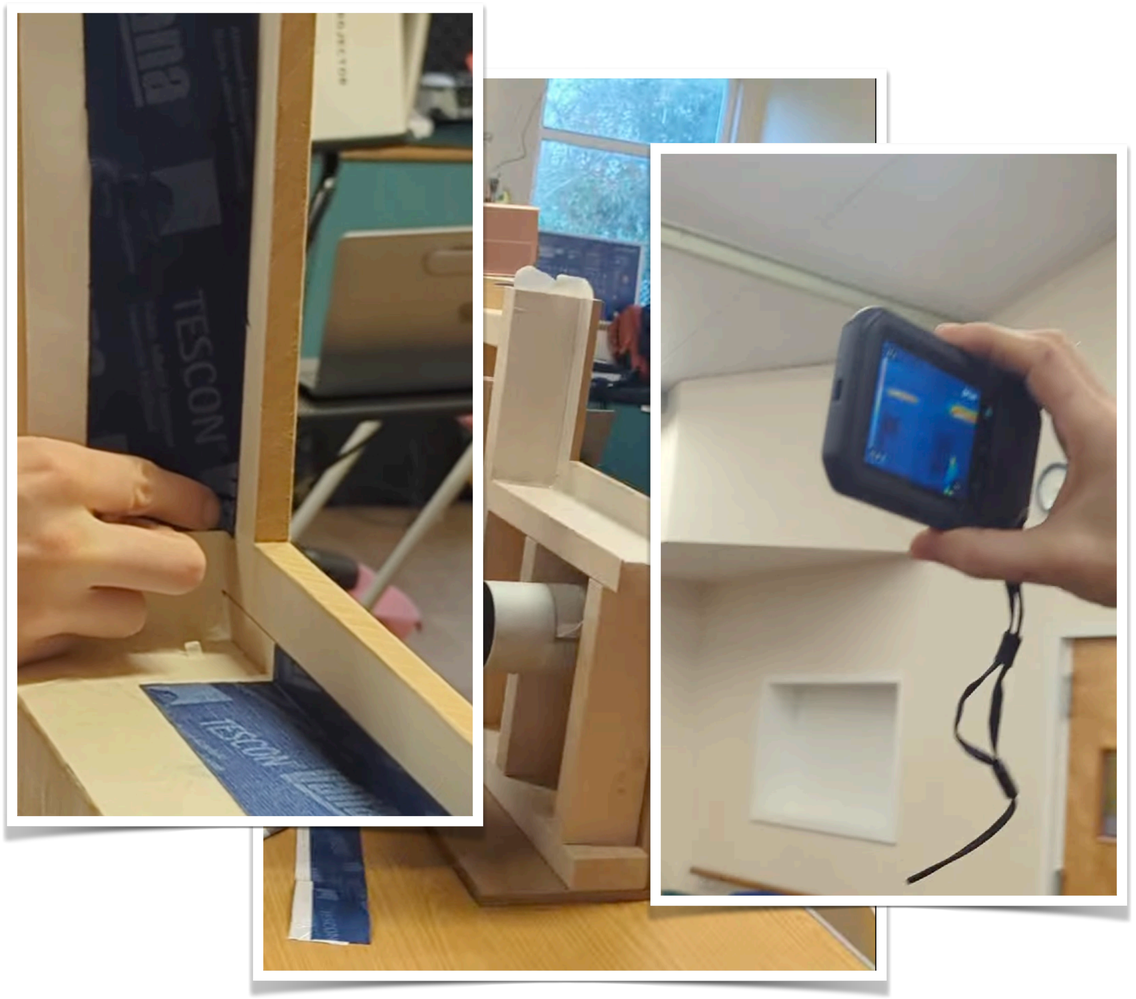


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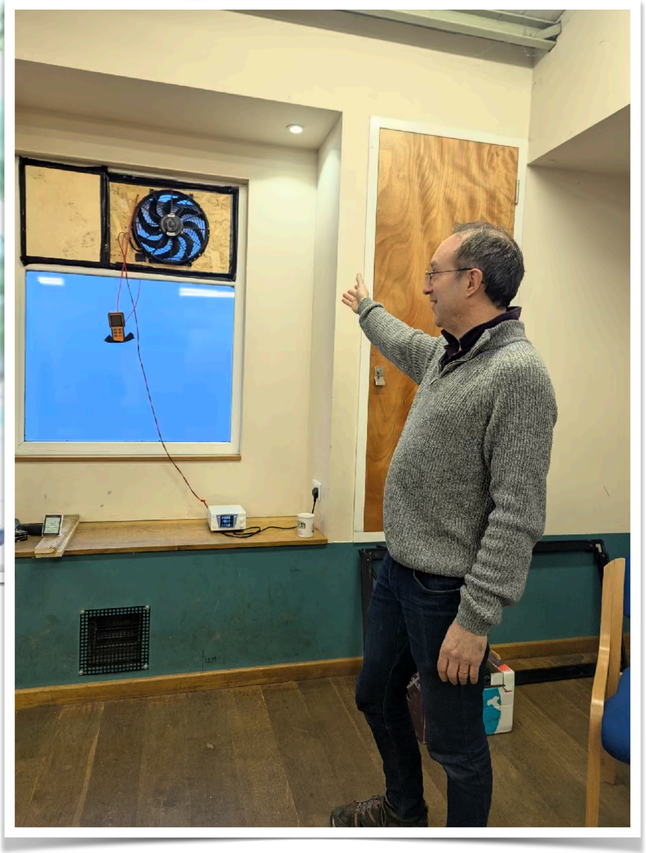
In-Window Airtightness Fan

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An in-window fan has been developed, to assist when implementing airtightness measures.

Courses are run to allow DIYers and trade to build their own fan.





Cambridge Retrofit Hub

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Home Energy Advice Network

- Home Visits
- Public Events
- Drop-Ins at Repair Cafes
- Presentations to communities

CEE Centre for Energy Equality

Pop-up stalls

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The Cambridge Room Repair Your Life Cafe has a Home Energy Advice pop-up stall the first Saturday of every month in the Grafton Centre.



Further resources

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Open Eco Homes

Open Eco Homes is a free home energy advice and information hub which has inspired thousands of Cambridgeshire residents to improve their home energy efficiency over the last 15 years.

We aim to showcase innovate and energy efficient homes through which people can gain insight of real-life examples, impartial information and knowledge from experienced homeowners. With detailed case studies for each home, and with over 80 new build and retrofitted eco-homes on record it is possible to find examples of many building types and energy efficient solutions.

In addition to the eco-home tours and information we host a number of expert led talks online to help to save money to improve your home energy and reduce your carbon footprint.

Our Flexible 1960s Home: Retrofitting for the Electric Age – Oakington



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OPEN eco HOMES

Deeper dive:

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Retrofit for all budgets



English Housing is the worst in Europe

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Insulate Tight & Ventilate Right

Deeper dive:
English Housing is the worst in Europe

What features am I looking for?

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- Top Layer - wind & water resistant
- GoreTex - Breathability
- Zips & cords - controlled ventilation
- Insulation - from the filler
- Thermal bridge free - flaps behind zips

What features am I looking for?

CAMBRIDGE RETROFIT HUB



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- Shading & ventilation to keep cool

What features am I looking for?

CAMBRIDGE RETROFIT HUB

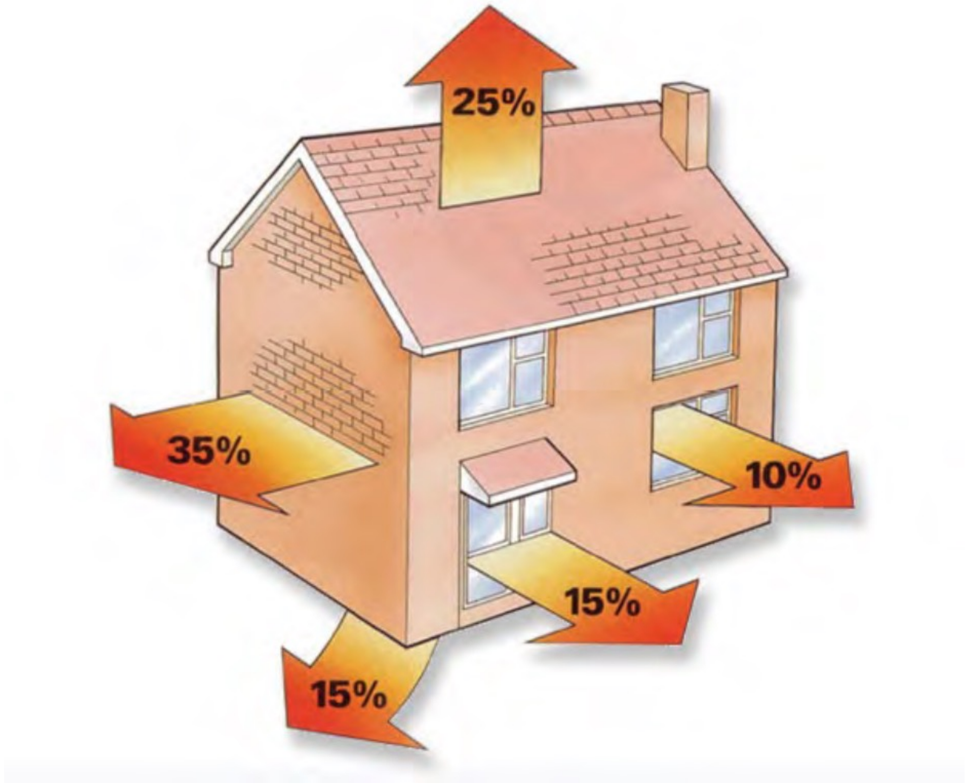


- Top Layer - wind & water resistant
- GoreTex - Breathability
- Zips & cords - controlled ventilation
- Insulation - ~~from the filler~~ slows down the transfer in/out of thermal energy
- Thermal bridge free - flaps behind zips
- Shading & ventilation to keep cool

% of heat lost from different parts of a house

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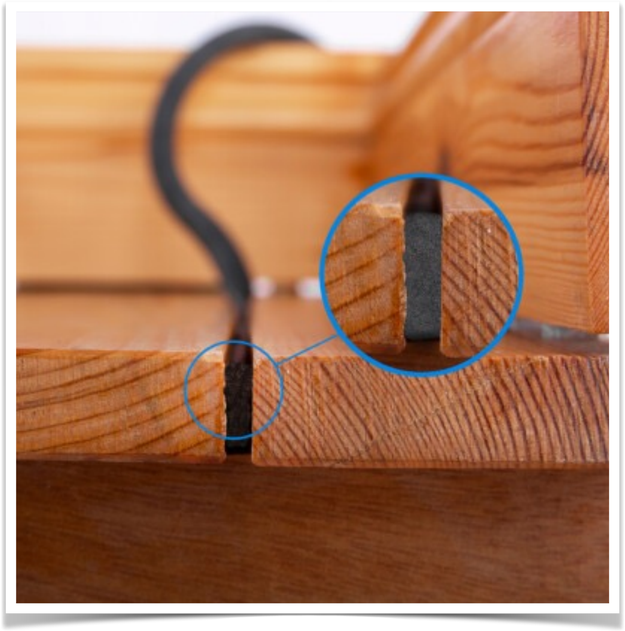
- ➡ **25%** through the **Roof**
- ➡ **35%** through the **Walls**
- ➡ **15%** through the **Floor**
- ➡ **10%** through the **Windows & Doors**
- ➡ **15%** through **Leaks & Draughts**



Insulation

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- **First steps** - radiator reflector panels; heavy curtains; secondary glazing film; floorboard draught excluder



Insulation

- **First steps** - radiator reflector panels; heavy curtains; secondary glazing film; floorboard draught excluder

- **Improved** - insulated plasterboard; IWI - Internal Wall Insulation; secondary or double glazing;



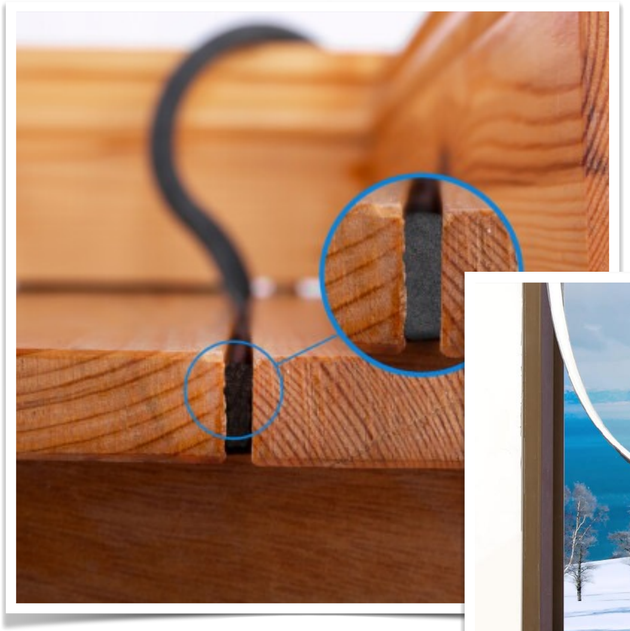
Insulation

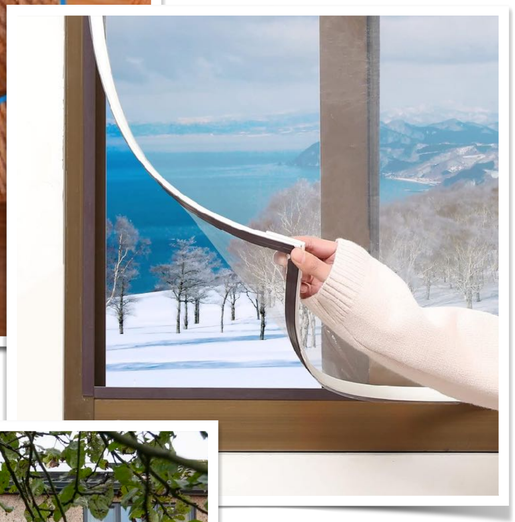
CAMBRIDGE RETROFIT HUB

- **First steps** - radiator reflector panels; heavy curtains; secondary glazing film; floorboard draught excluder

- **Improved** - insulated plasterboard; IWI - Internal Wall Insulation; secondary or double glazing;

- **Advanced** - EWI - External Wall Insulation; triple glazing; airtightness layer







Healthy Indoor Temperature

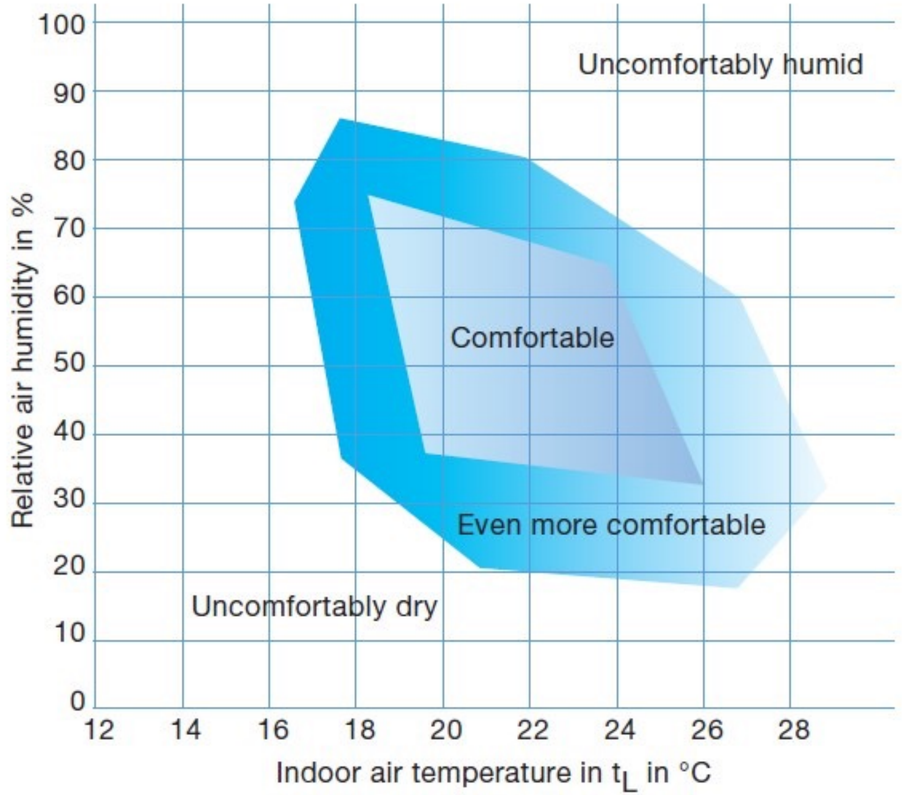


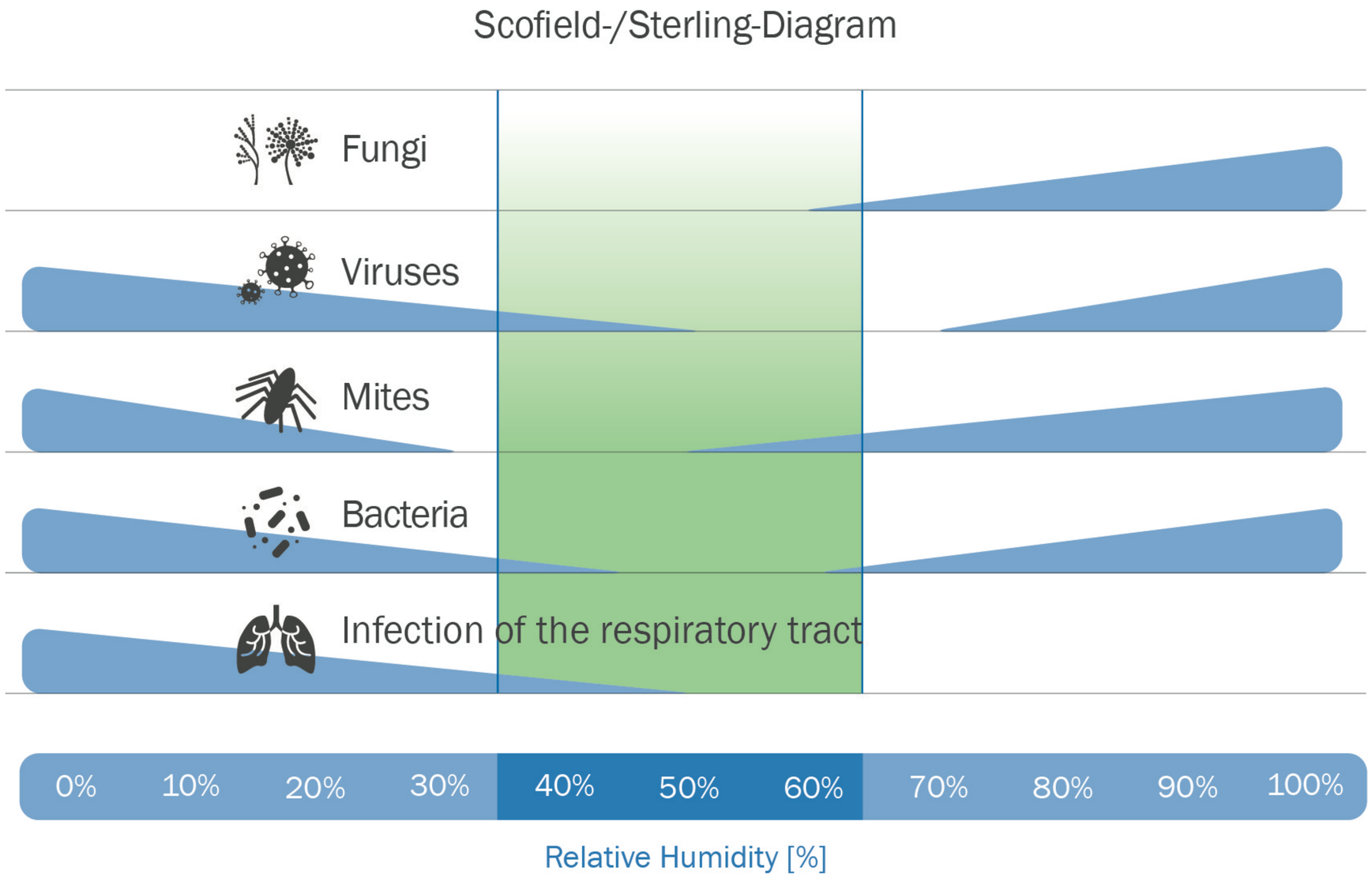
Fig. 2: The comfort level chart shows when people feel comfortable. It allows the temperature and the corresponding relative humidity of the indoor air to be derived.

Source: Testo

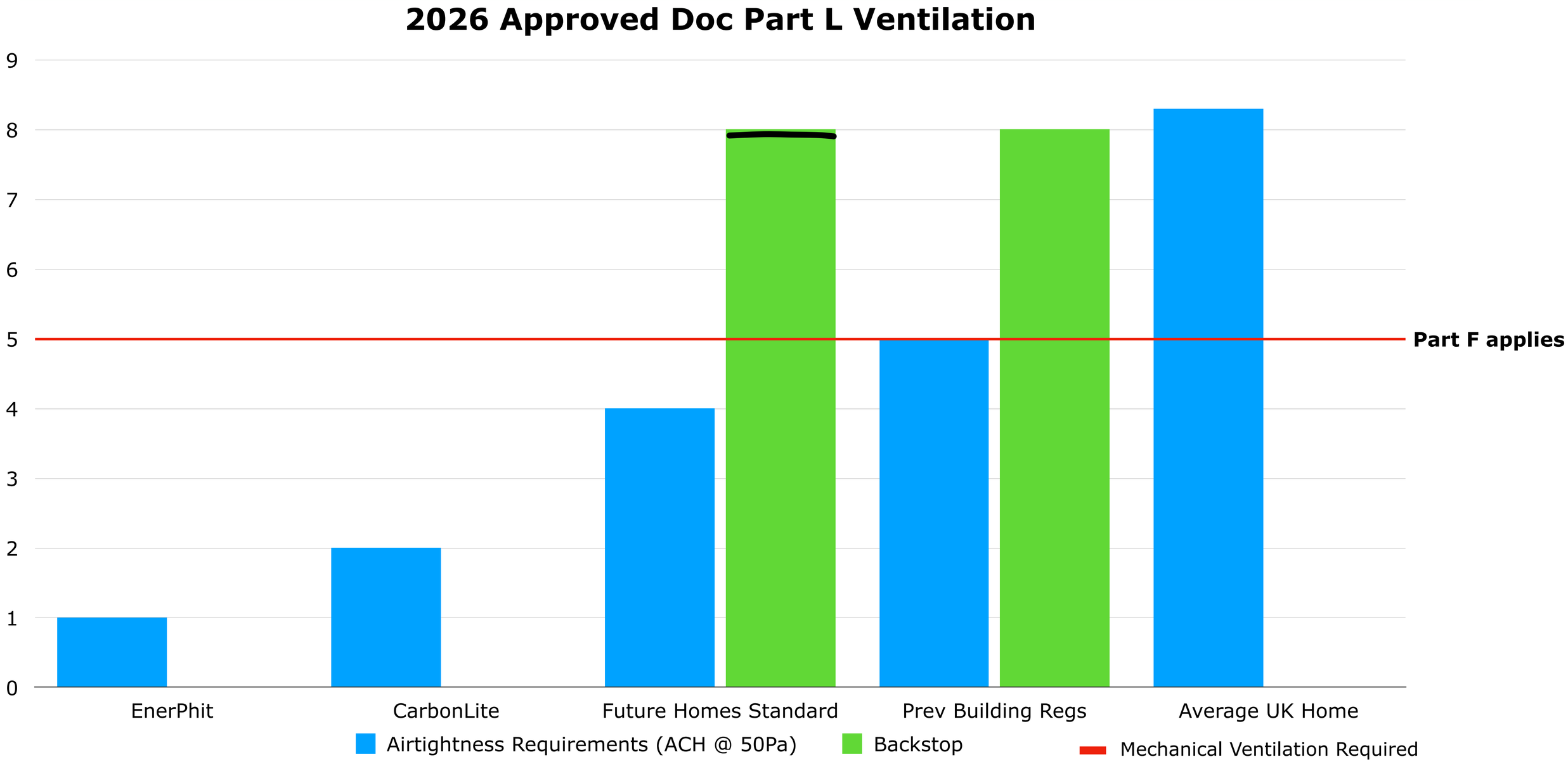
The World Health Organisation supports a minimum room temperature of 18°. WHO further states: “There is no demonstrable risk to human health of healthy sedentary people living in air temperature of between 18 and 24°C.”

Healthy Indoor Humidity

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Airtightness



% of heat lost from different parts of a house

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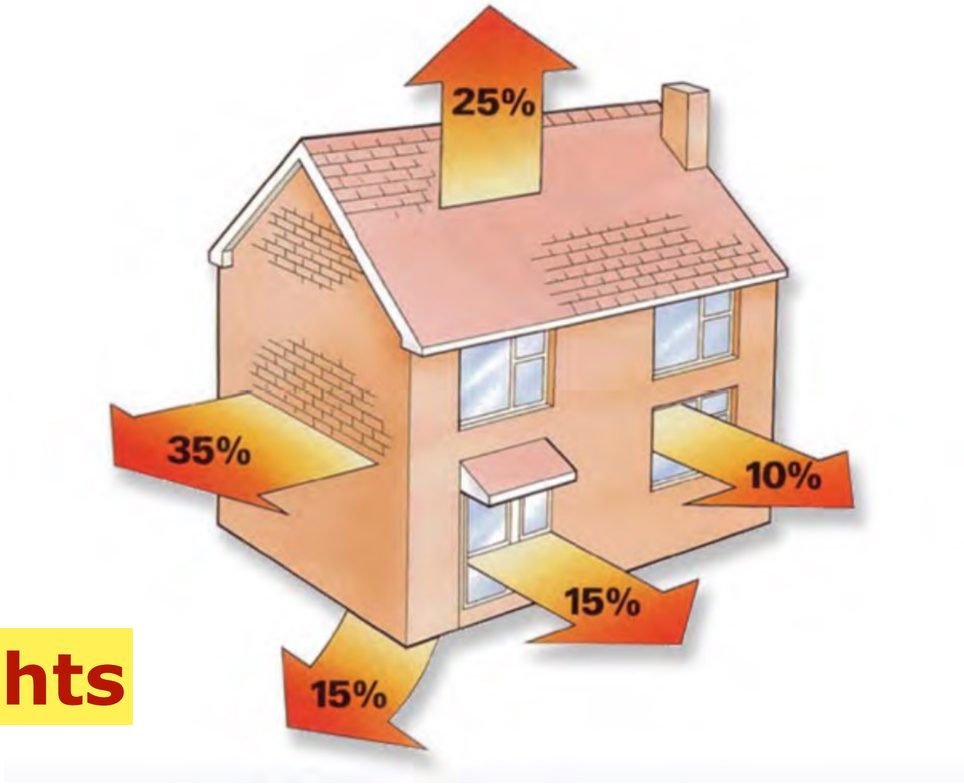
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Ventilation

- **First steps** - Passive Ventilation; ensure air-bricks/grates & trickle vents are not blocked, house-burping



Source: Wikimedia

Ventilation

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Probably the best thing you can do: Stoßlüften / House Burping

How to Do It

- Open Wide: Open windows fully (not just ajar) and open interior doors for cross-ventilation.
- Short Burst: Keep them open for the recommended time, creating a "shock" of fresh air.
- Repeat: Aim for twice a day, often in the morning and evening, or after cooking/ showering.

Why It Works

- Prevents Mould: Quickly removes moisture
- Saves Energy: The walls and furniture stay warm, quickly reheating the fresh air, making it more efficient than leaving windows slightly open for hours.

How Long?

- Winter: outside 5ºC approx 5 mins, can be less if windy or good cross ventilation
- Spring & Autumn: outside 10ºC approx 10-15 mins

Deeper dive:

House Burping effect

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Indicator	Before airing	After ~10 min cross-vent	Main indoor sources
CO2 (ppm)	1,200–1,800	600–700	People breathing, poor ventilation
PM2.5 (µg/m³)	25–60	<10–15	Cooking, candles, dust, smoking
VOCs (relative)	High after cleaning/painting	50–80% lower	Cleaners, sprays, furnishings
Humidity (RH)	60–70%	45–55%	Showers, drying clothes, cooking

Ventilation

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- **First steps** - Passive Ventilation; ensure air-bricks/grates & trickle vents are not blocked; house-burping



- **Improved** - improved extraction in wet rooms; Continuous Mechanical Extract Ventilation; single-room MVHR; house-burping; ~~PIV – Positive Input Ventilation~~



Ventilation

- **First steps** - Passive Ventilation; ensure air-bricks/grates & trickle vents are not blocked; house-burping
- **Improved** - improved extraction in wet rooms; Continuous Mechanical Extract Ventilation; Mechanical ventilation; house-burping; single-room MVHR; ~~PIV - Positive Input Ventilation~~
- **Advanced** - whole house Mechanical Ventilation with Heat Recovery

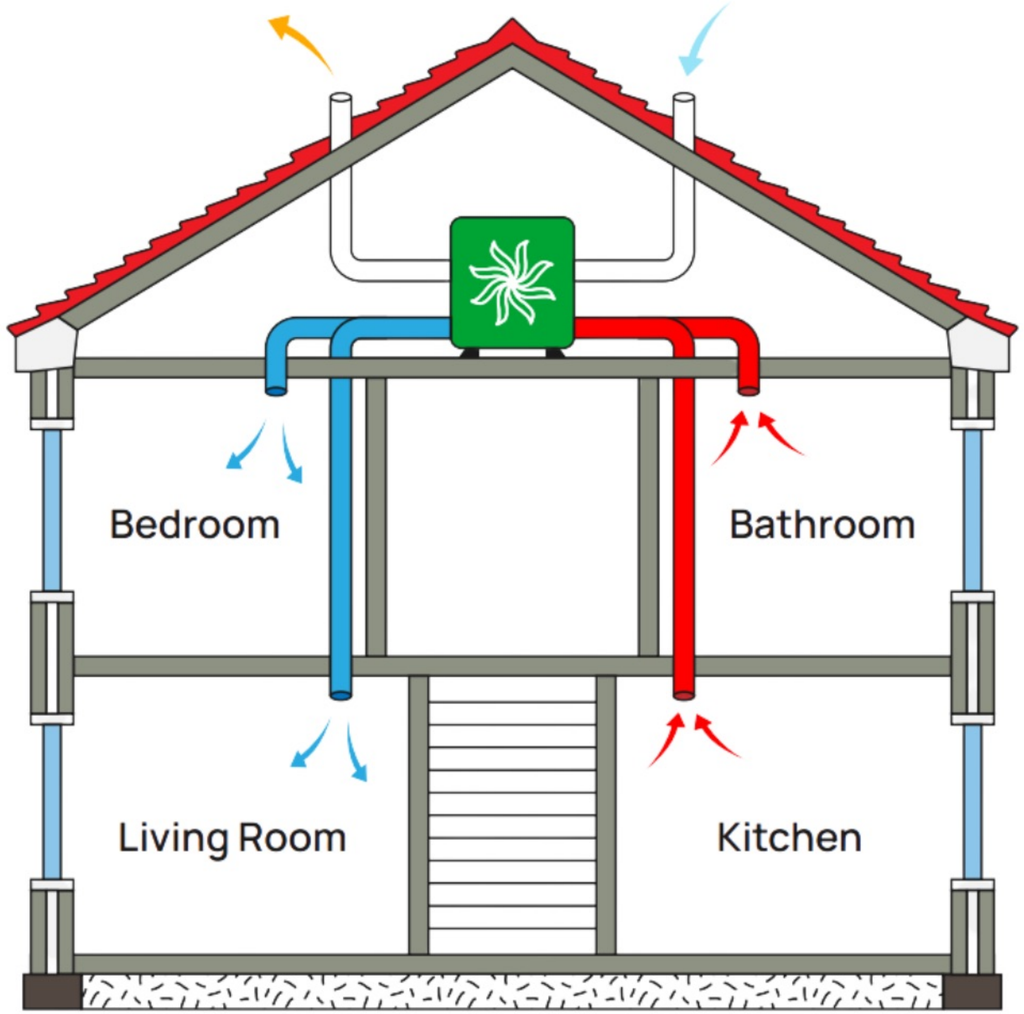


Source: Steinberg

Ventilation

Mechanical Ventilation with Heat Recovery

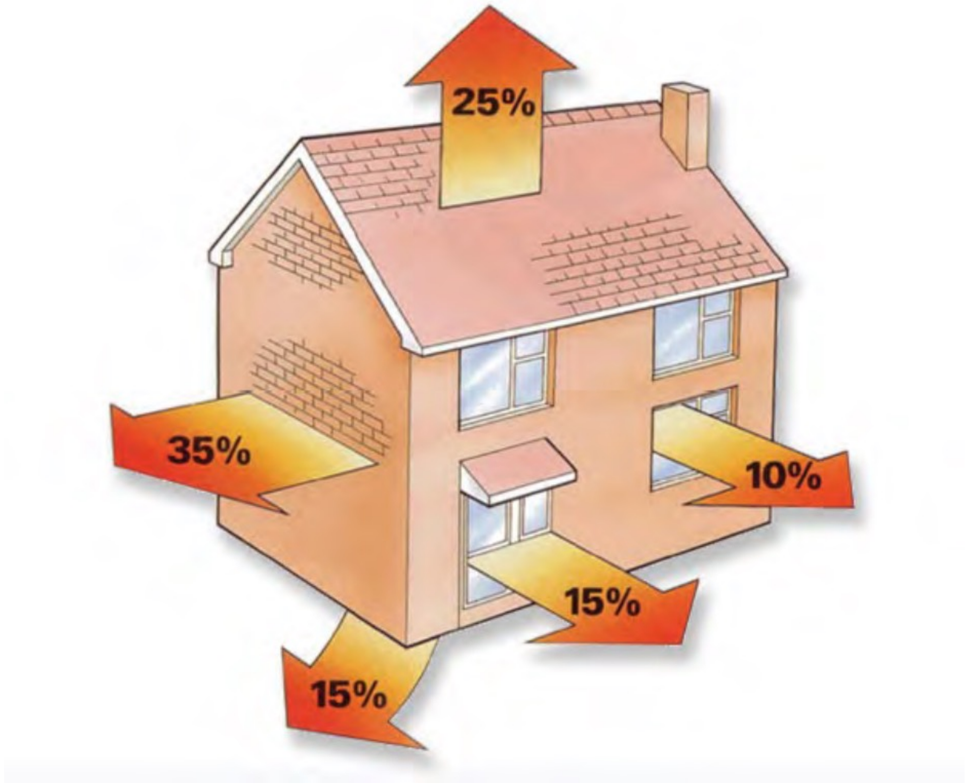
- Constant comfort
- lower heating/ cooling bills
- fresh filtered air
- energy efficient
- summer bypass



% of heat lost from different parts of a house

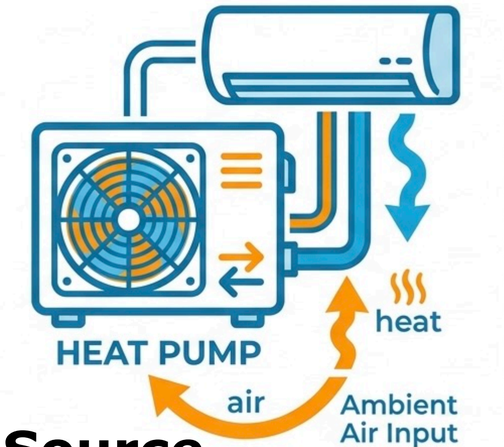
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Renewable Heating

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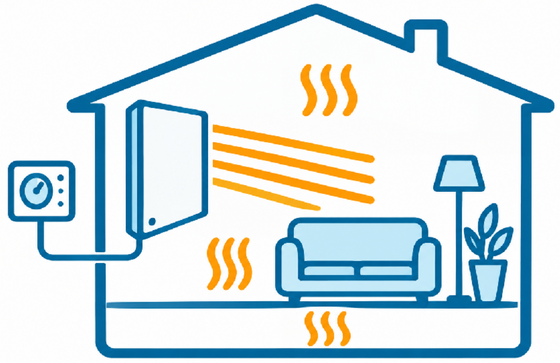




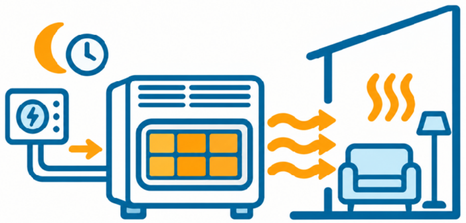
ZERO EMISSIONS BOILER



PCM (PHASE CHANGE MATERIAL) BATTERY



INFRARED PANEL

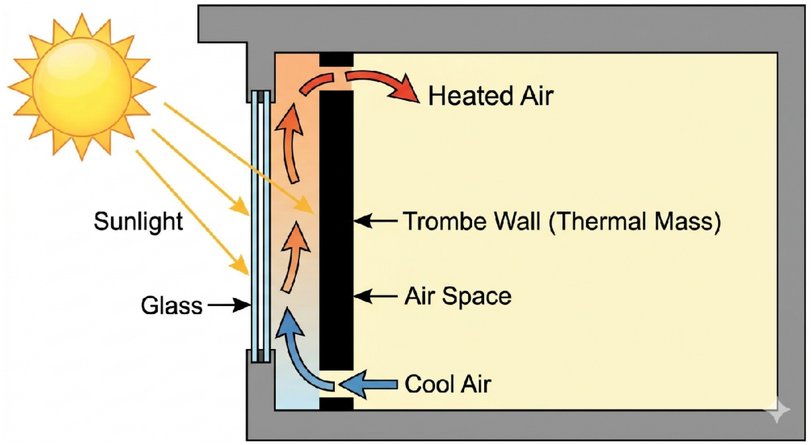


ELECTRIC STORAGE HEATING

Source

Air
Ground
Water
Acoustic

‘It bl**dy works’

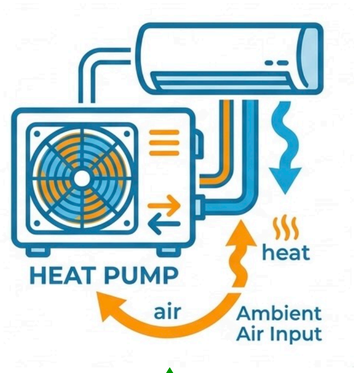


PASSIVE ARCHITECTURAL - TROMBE WALL

Deeper Dive

The holy trinity of energy efficiency

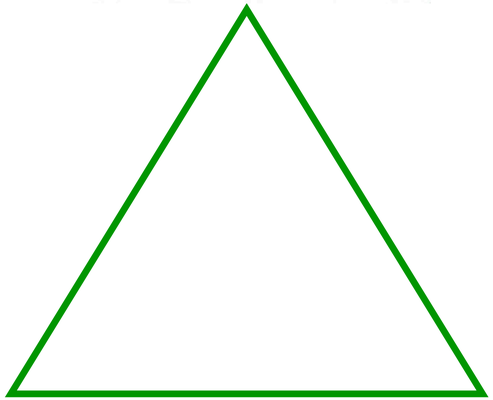
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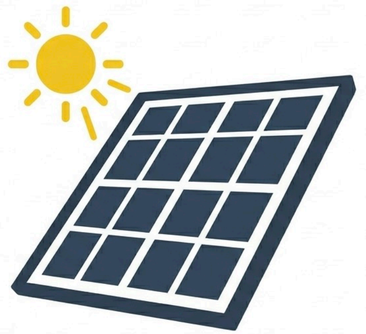


Renewable heating can provide your heating and cooling in an energy efficient way.

A home battery can store Solar PV generated electricity, or year-round cheap-rate, to use/export during peak hours.



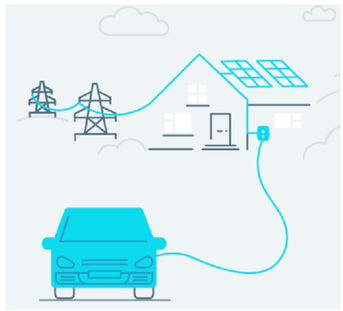




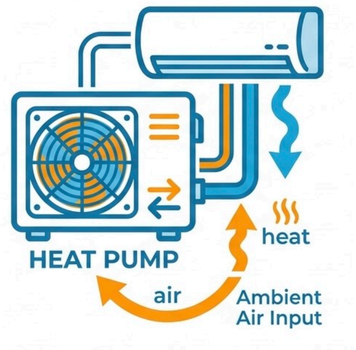
Electricity generated by Solar PV Panels is best used immediately, or stored to export/use during peak hours.

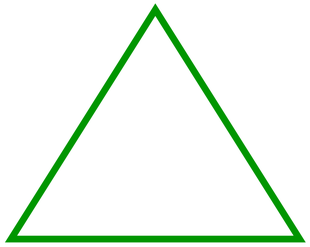
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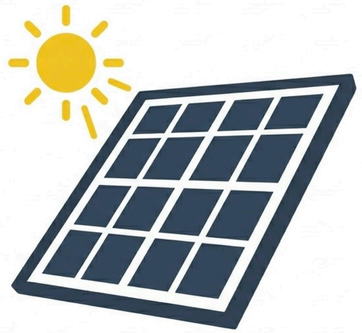
CAMBRIDGE RETROFIT HUB









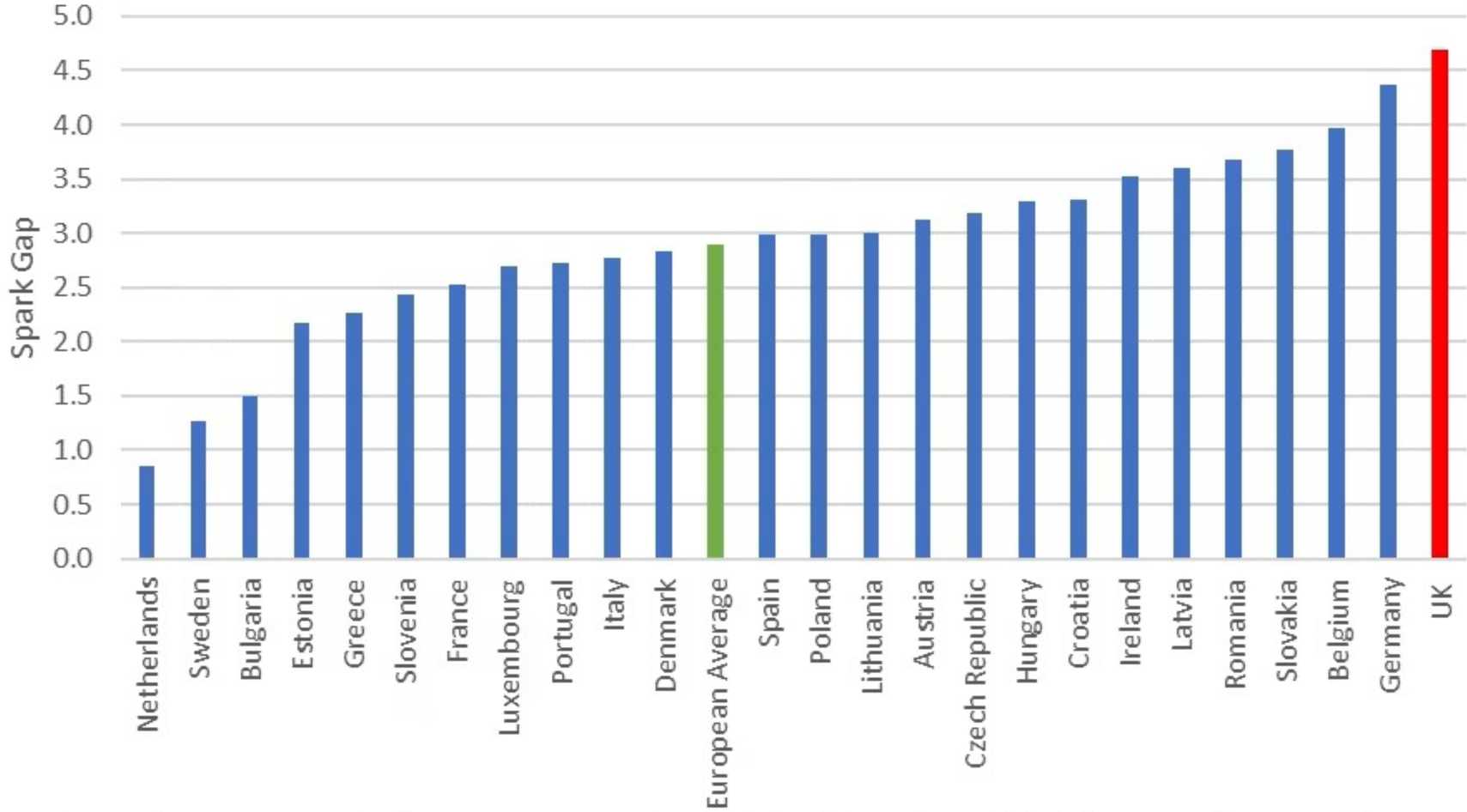


First Steps: Plug-in battery
Intermediate: Home Battery
Advanced: Large Home Battery, V2G/H Vehicle-To-Grid/Home

First Steps: Balcony solar PV
Intermediate: solar PV array
Advanced: Large solar PV array/s

Spark Gap

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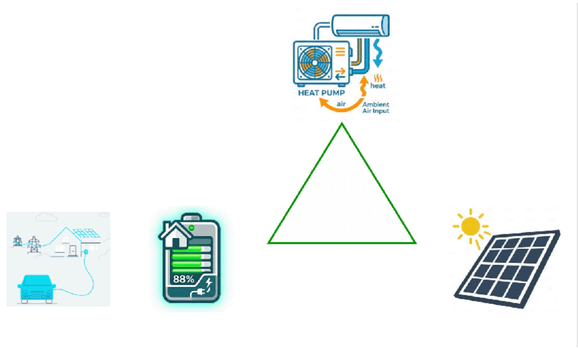


Comparison of spark gaps in European countries – July ’21 to June ‘22 | Source: Richard Warren/Linkedin

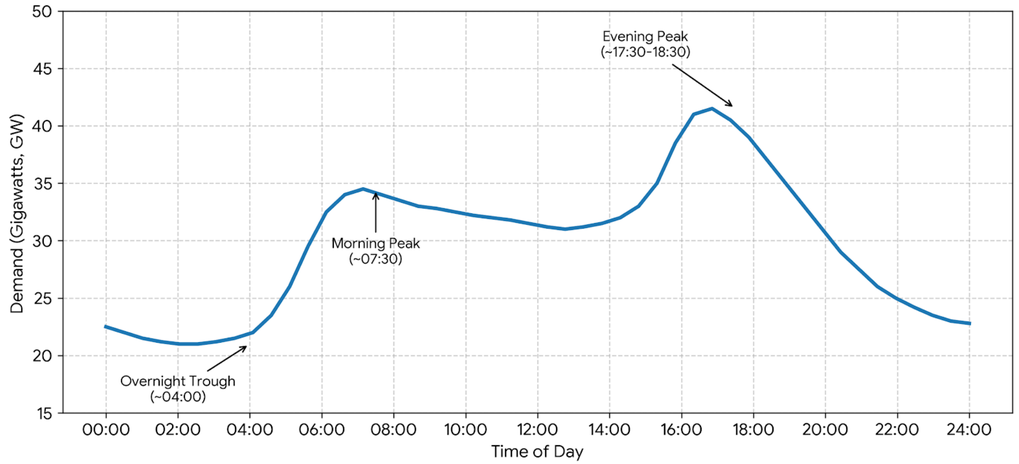
Deeper dive:

The holy trinity of energy efficiency

CAMBRIDGE RETROFIT HUB



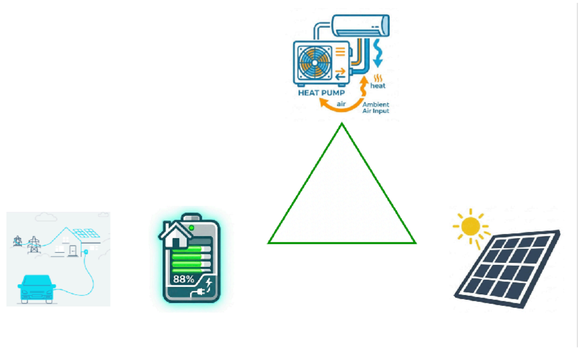
Typical UK Electricity Demand Over 24 Hours



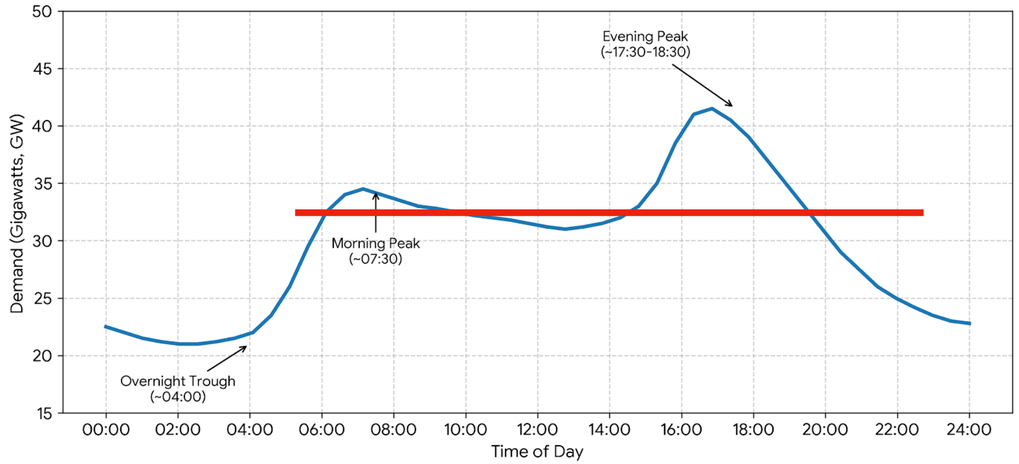
data trends from the National Energy System Operator (NESO)

The holy trinity of energy efficiency

CAMBRIDGE RETROFIT HUB



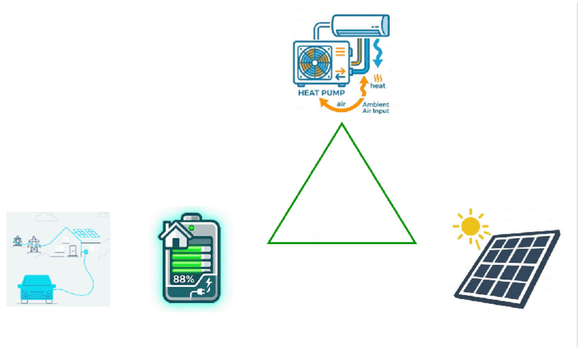
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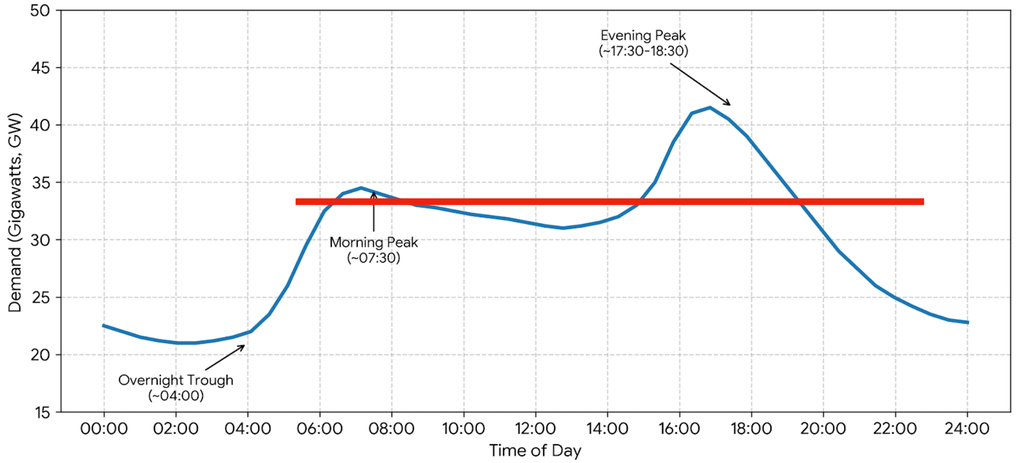
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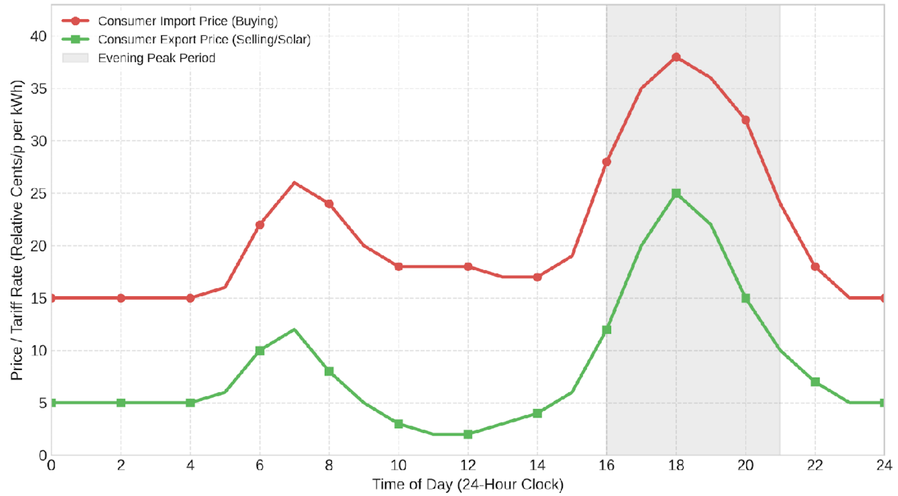
CAMBRIDGE RETROFIT HUB



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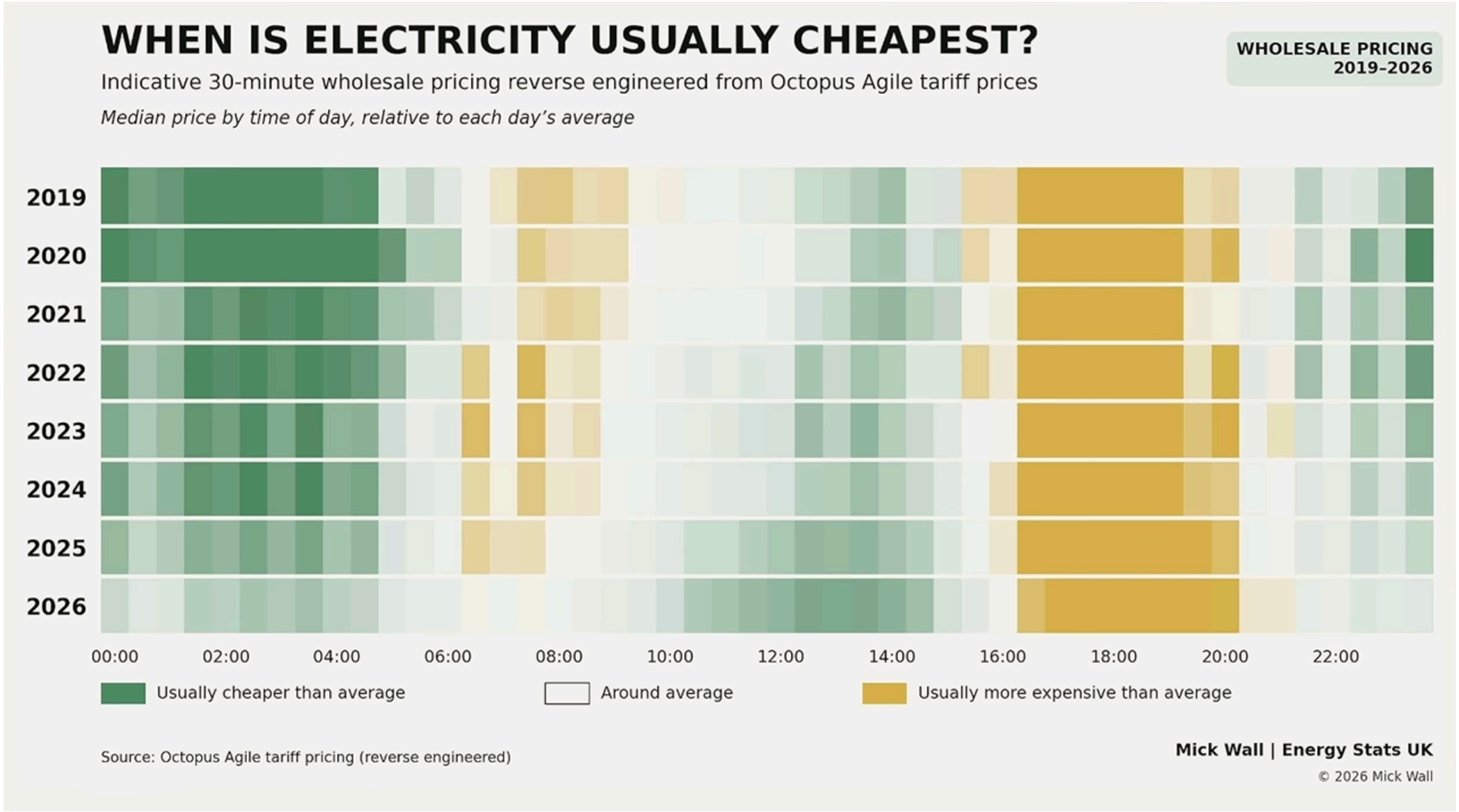
Typical Consumer Electricity Prices vs. Time of Day



data trends from the National Energy System Operator (NESO)

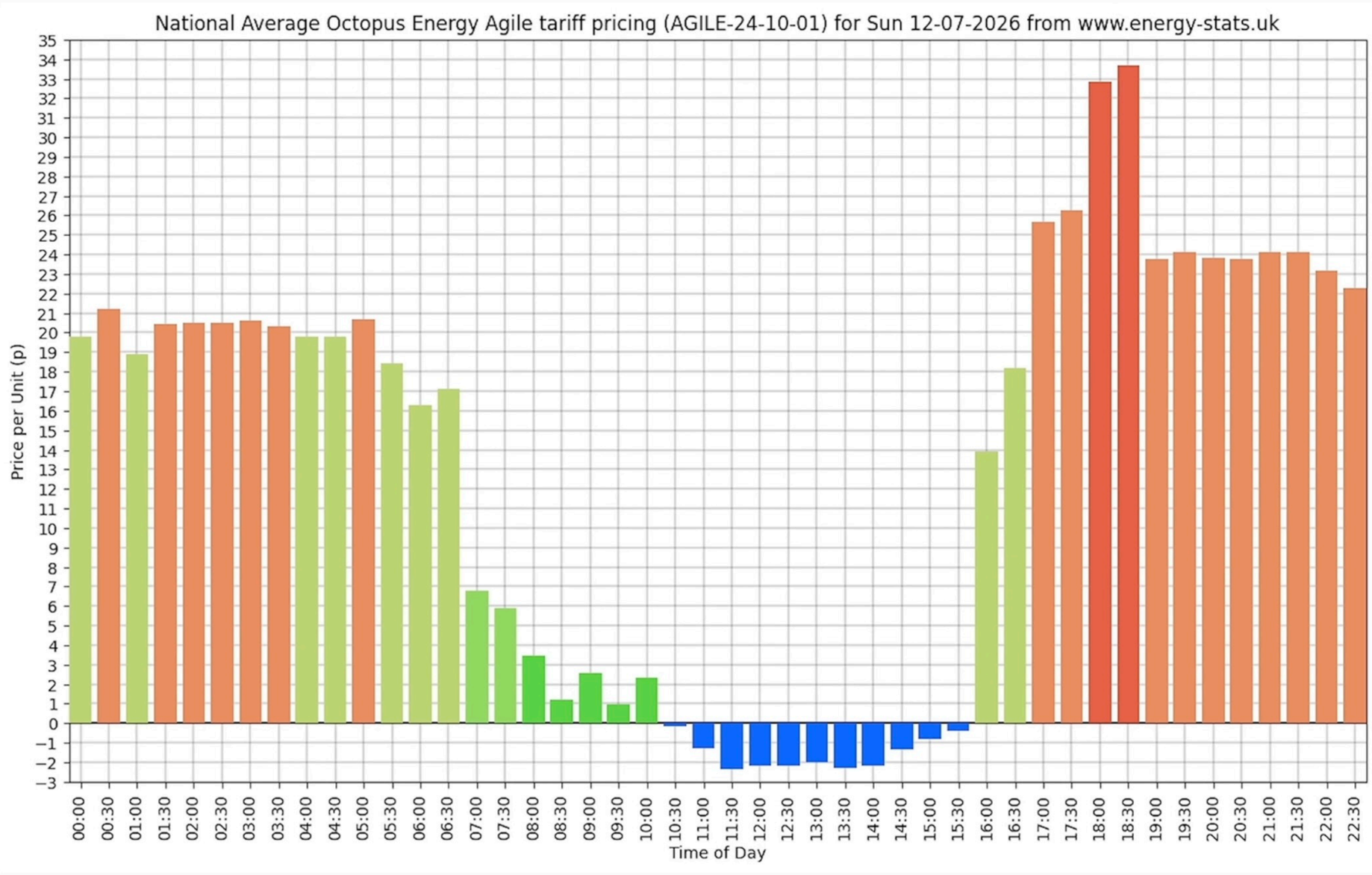
Electricity Demand

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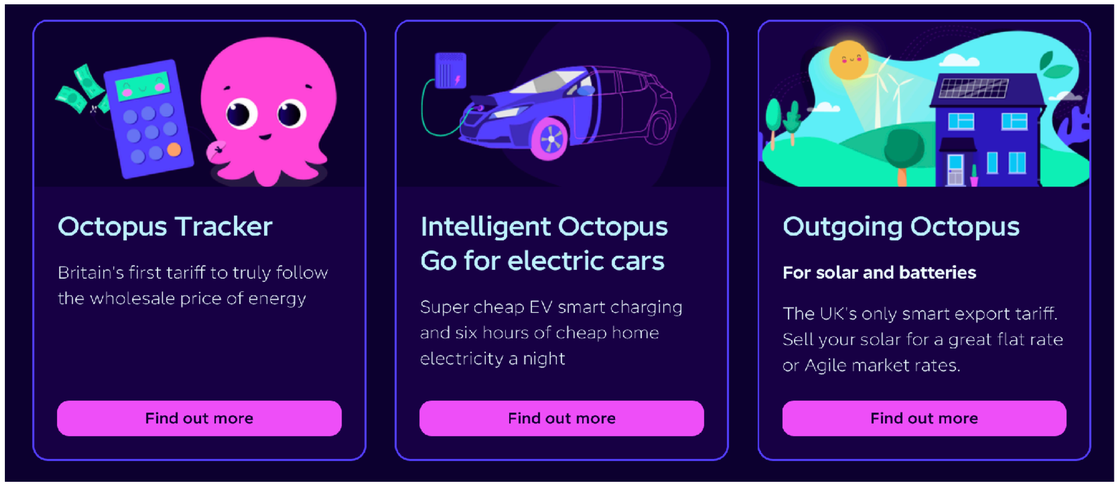
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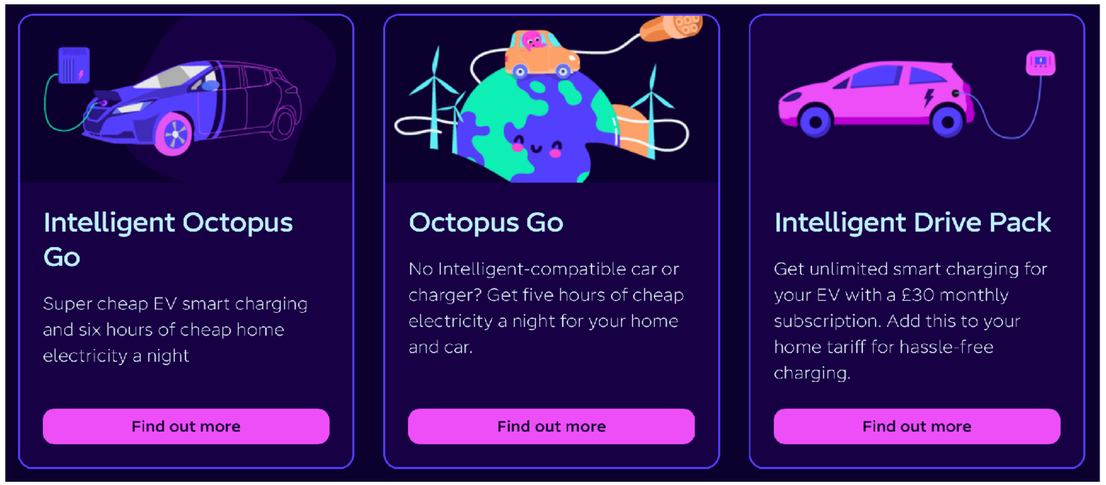
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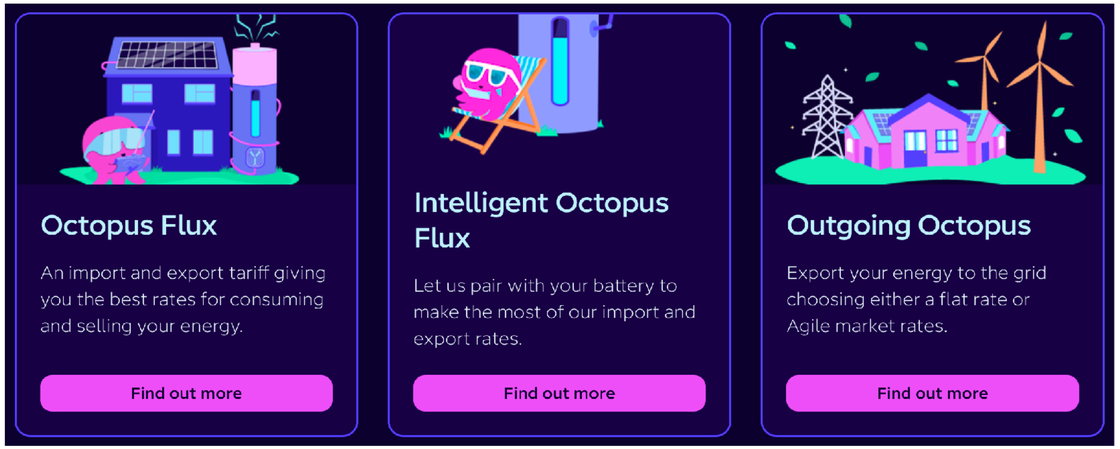


Smart Tariffs

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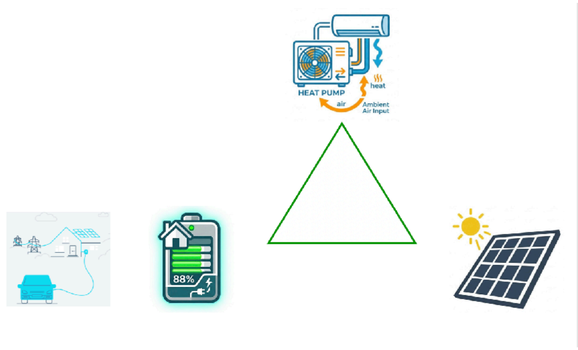




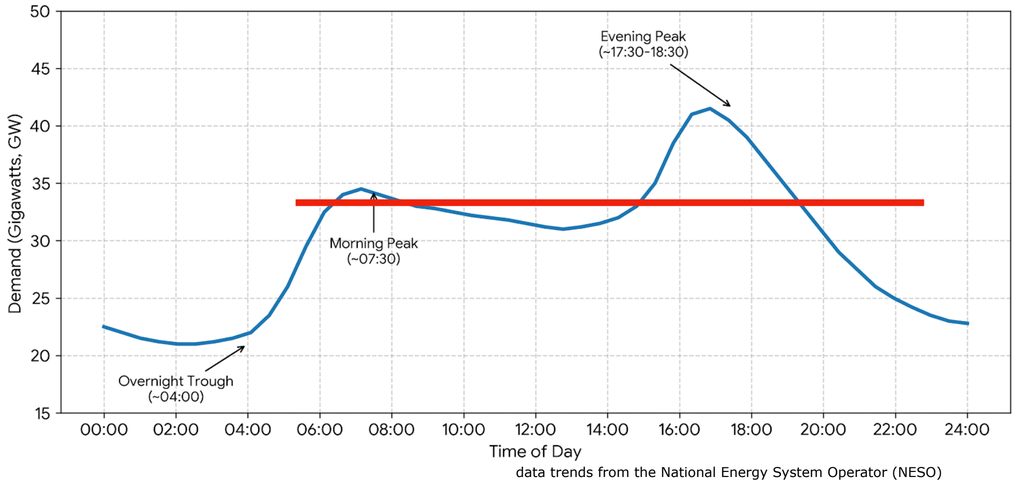
Deeper dive:

The holy trinity of energy efficiency

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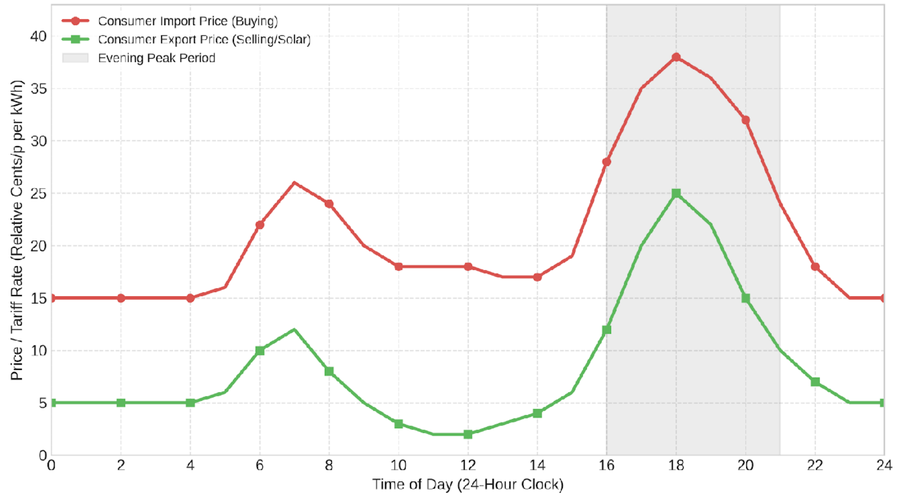


Typical UK Electricity Demand Over 24 Hours



data trends from the National Energy System Operator (NESO)

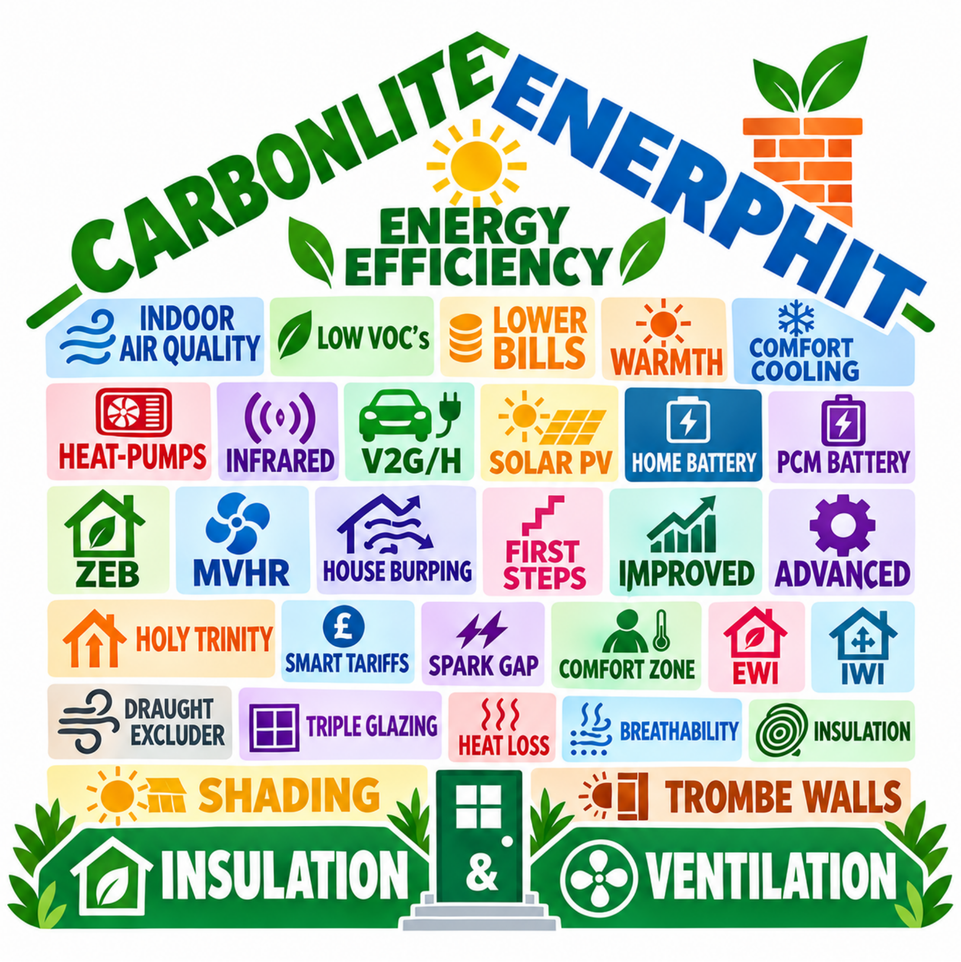
Typical Consumer Electricity Prices vs. Time of Day



= Zero Bills (or better)

Q&A Time

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Thank you

Smiley faced emoticon

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