

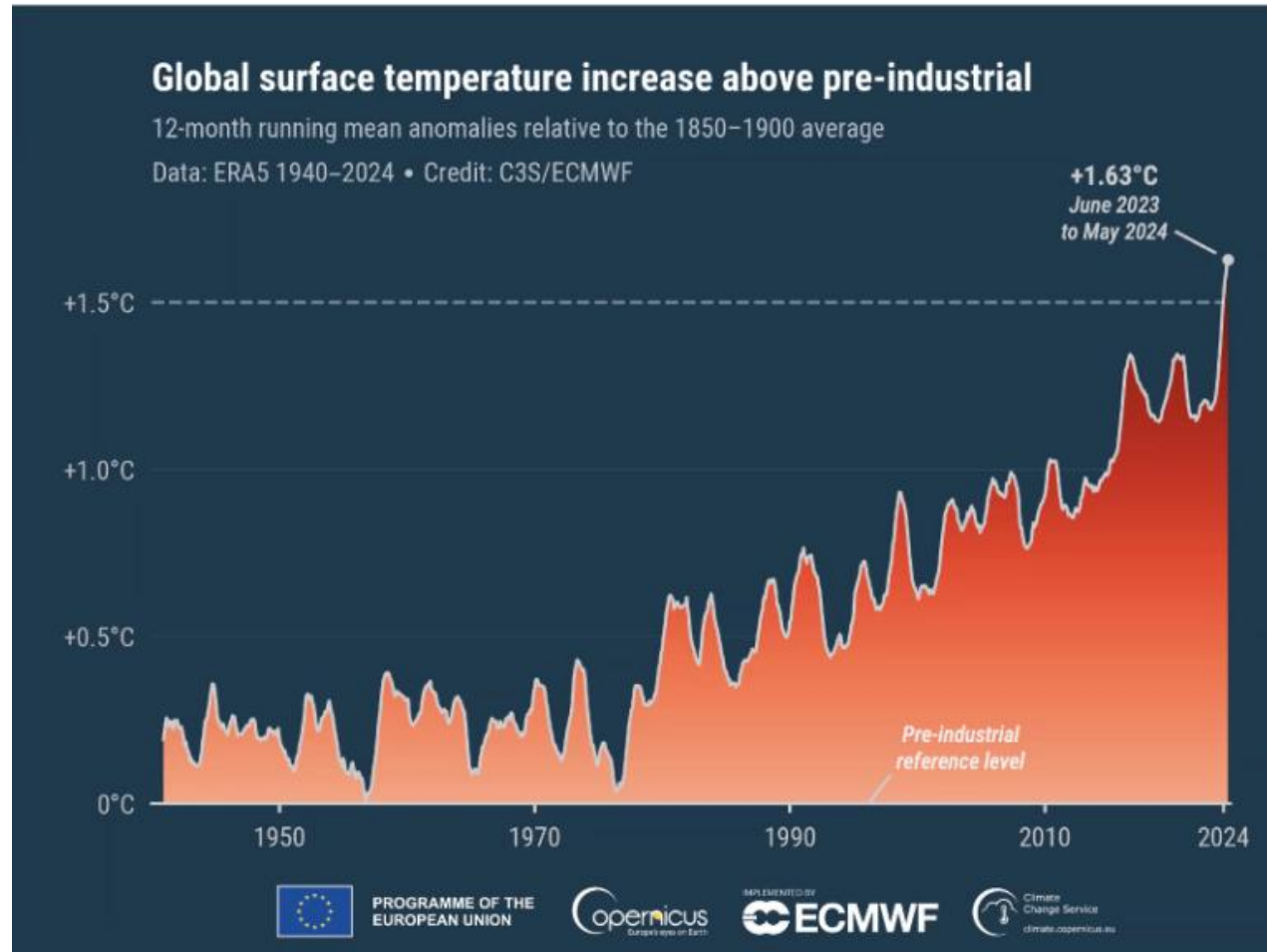
Heat Pumps – Myths or Magic?

The politics & technologies of the domestic energy transition

November 2025

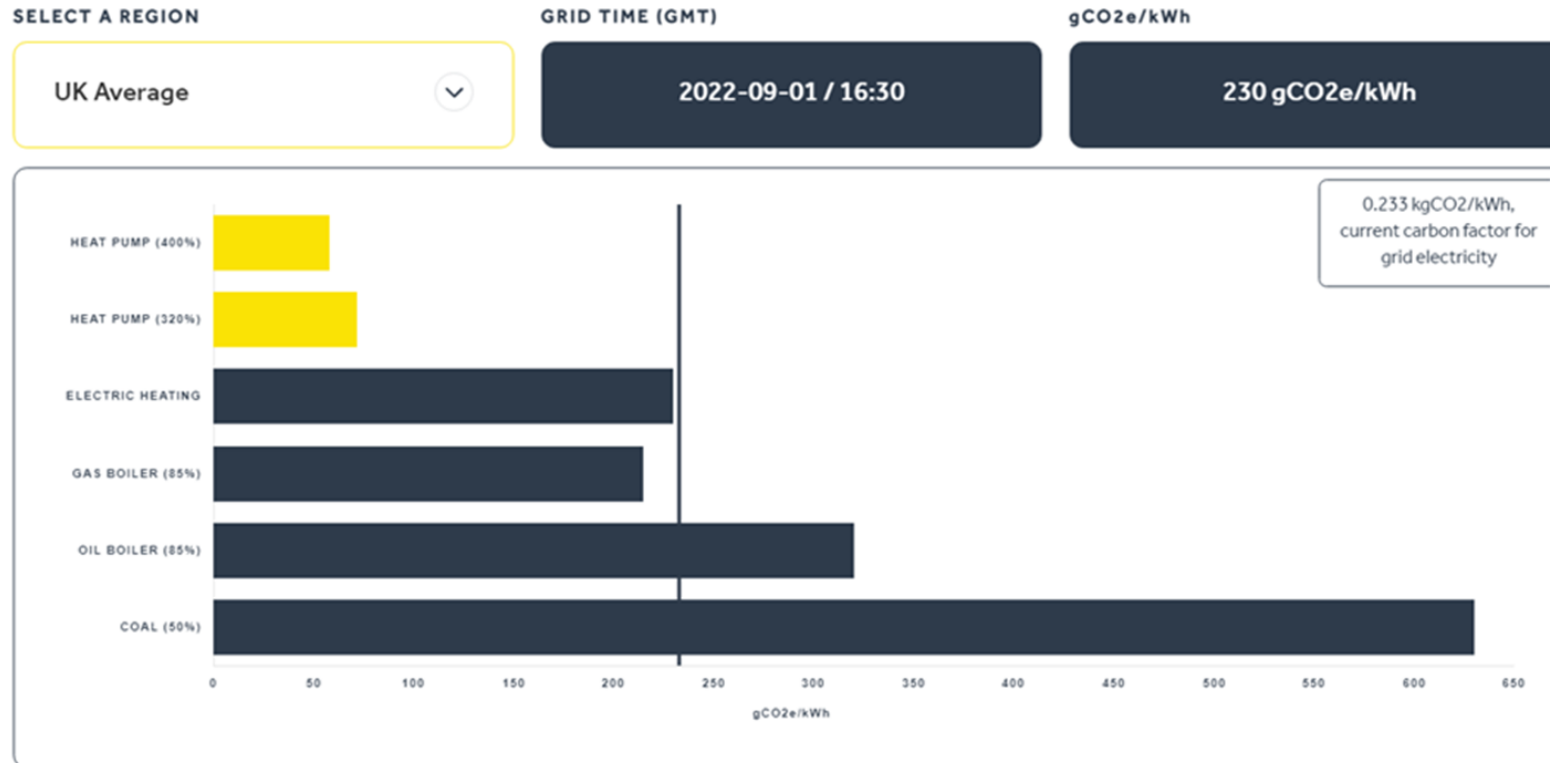


Why are we here?



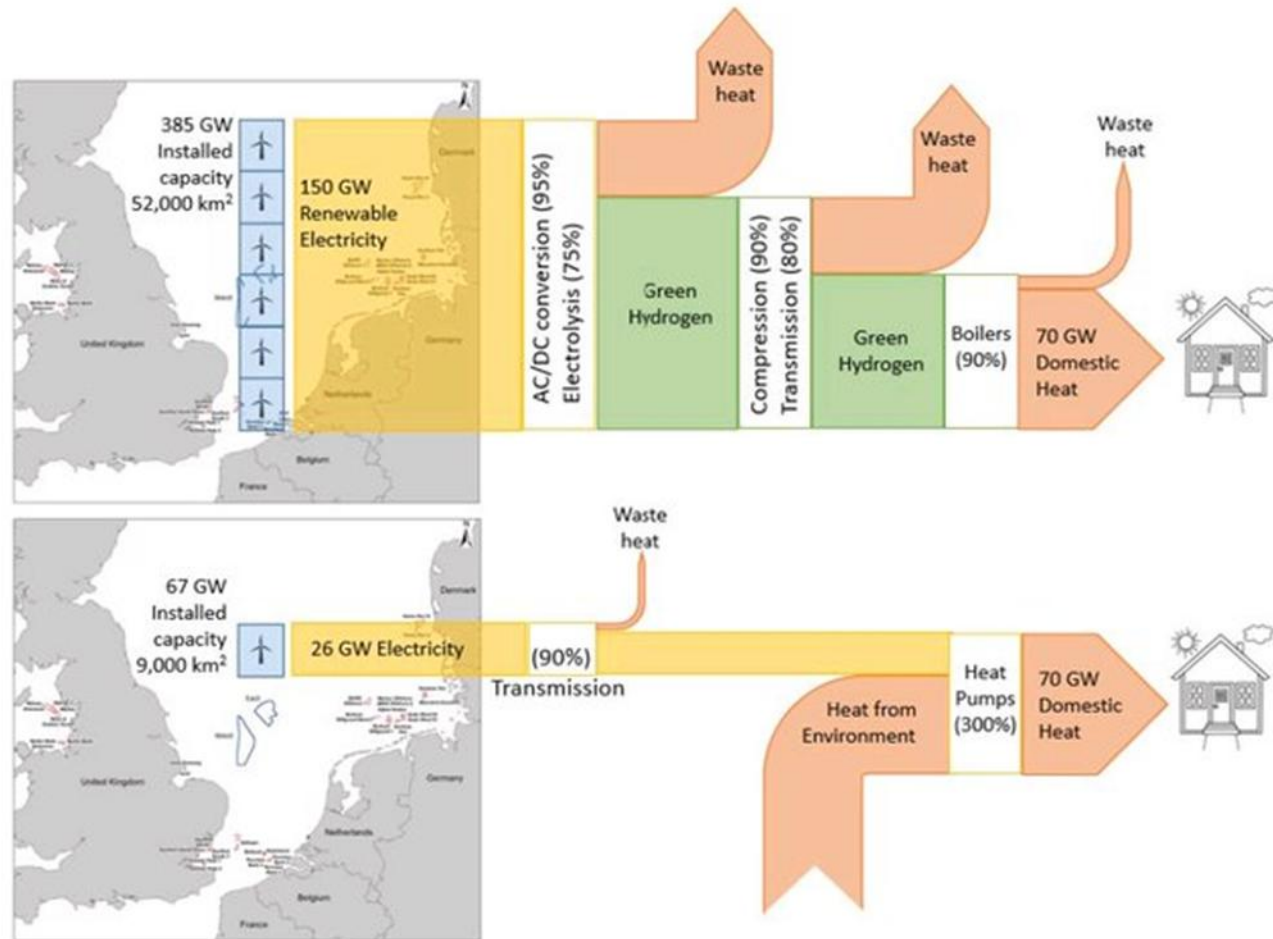
- <https://healthpolicy-watch.news>

Why is electrification carbon-efficient?



<https://www.hpf.org.uk/carbonwatch>

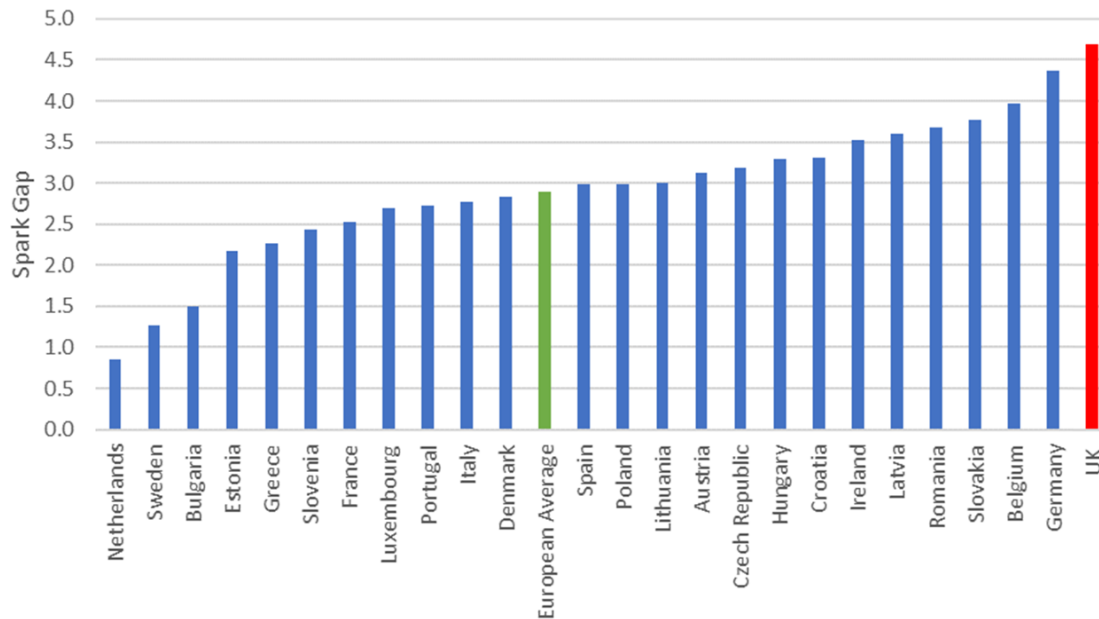
Why is electrification energy-efficient?



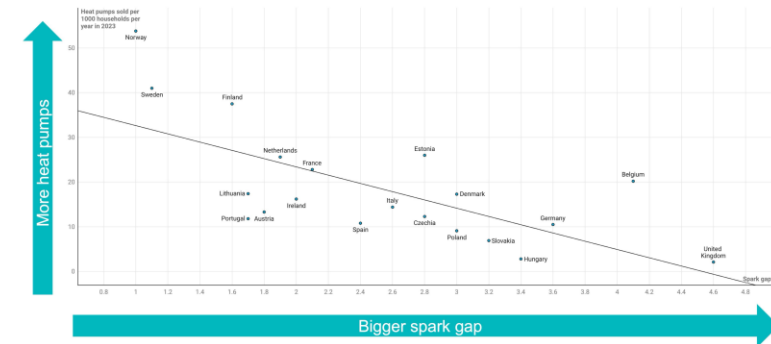
- <https://h2sciencecoalition.com/>

The negative impact of the “spark gap”

- High electricity prices are a drag on decarbonisation
- Commercial consumers are not protected by price caps

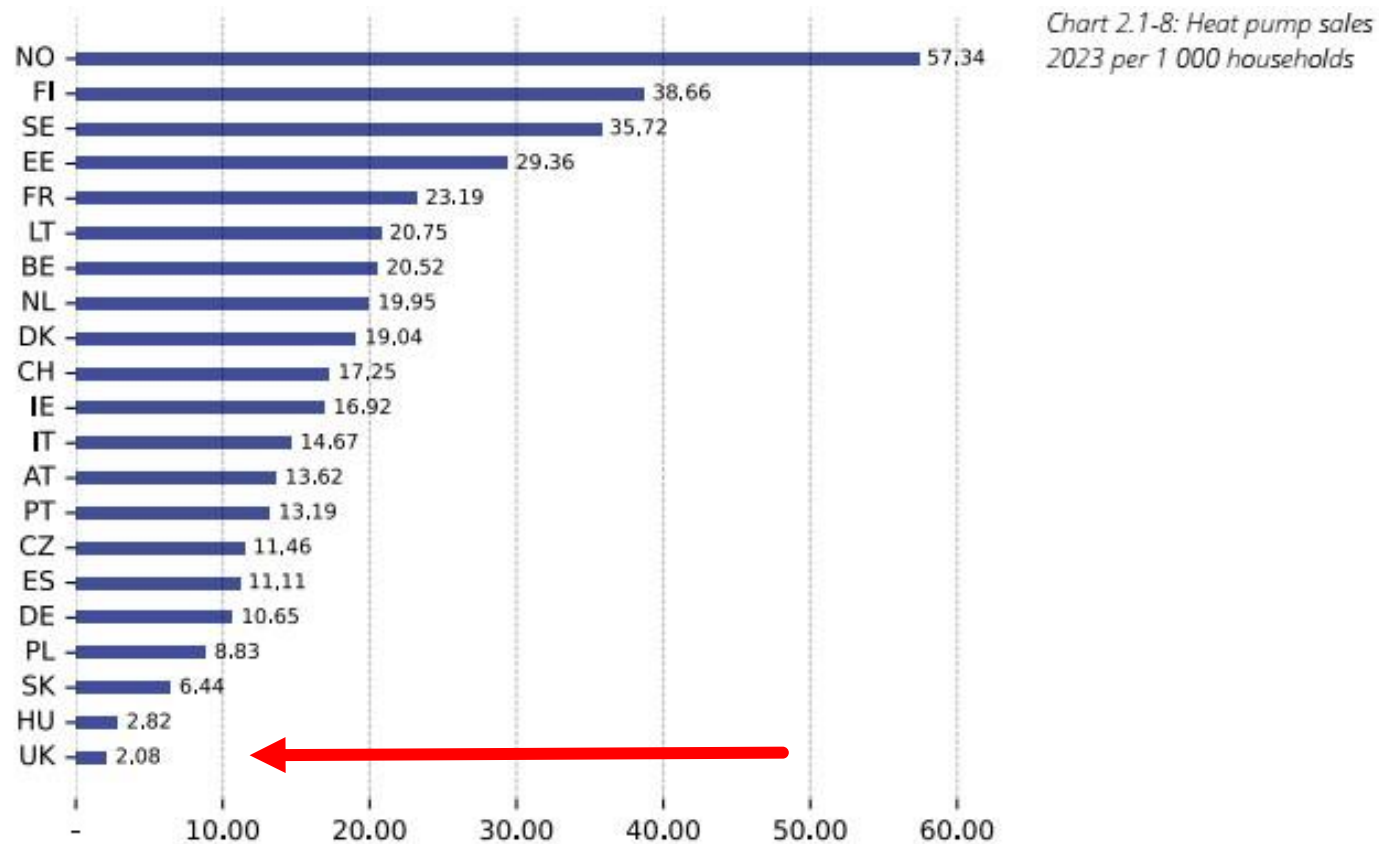


Bigger spark gap means fewer heat pumps



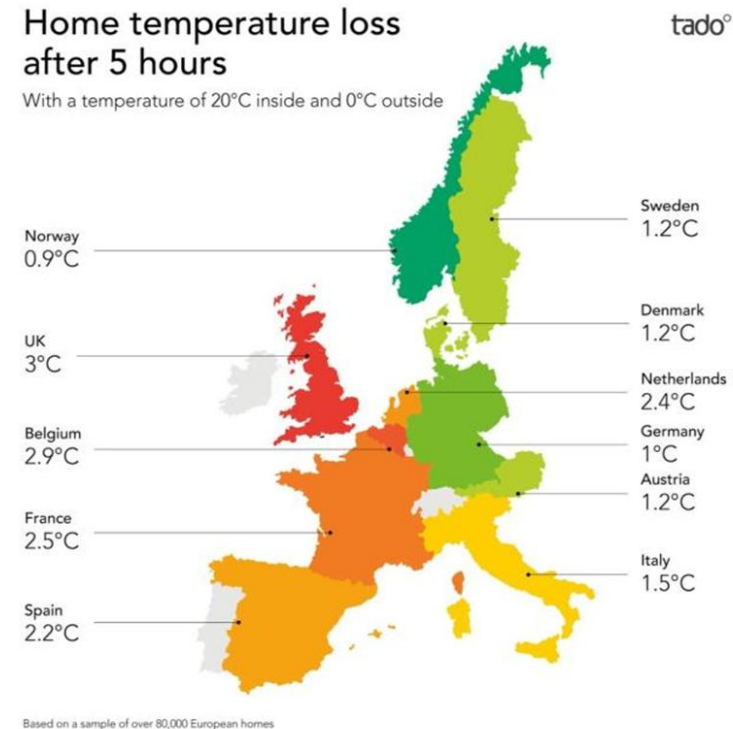
UK status & comparisons in graphs – deployment

- The result of years of poor electrification policy compared to the EU



Why is UK heating such a challenge?

- UK housing stock is amongst the worst for thermal performance in Europe
- But the building does not know where the heat comes from, so this is not a heat pump problem
- 55°C is now the common design flow temperature in Building Regulations for all heating technologies, including boilers



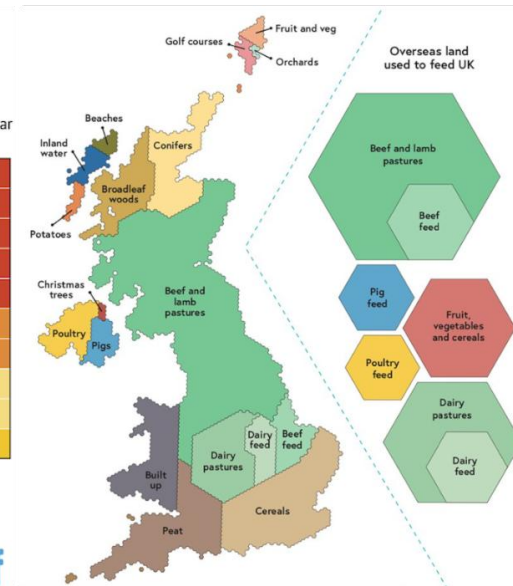
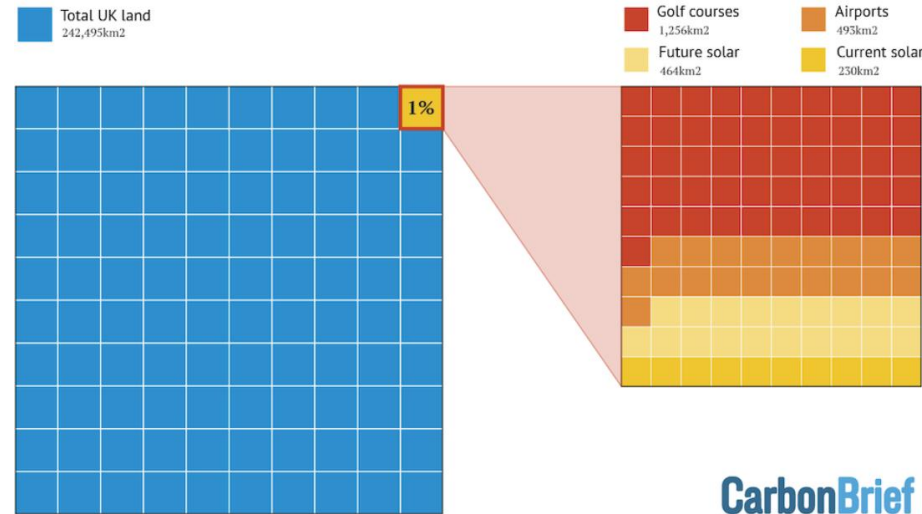
Progress at macro-scale



Where should new assets be deployed?

Golf courses take up more space than solar power in the UK

Current and future solar power land use compared to other uses



CarbonBrief

The grown-up conversation

- Why the burning of fossil fuels needs to stop
- Electrification is the chosen pathway, because electricity will be zero carbon & why flexibility works
- There is an electrification solution for all homes, including heat networks
- We've been here before..., with central heating
- Empowering through knowledge



Committee on Climate Change

- Seventh Carbon Budget advice to government
- The lowest carbon heat must be the lowest cost heat
- The cost of Net Zero isn't as high as detractors present – what's the cost of Not Zero?
- Investment needs to start immediately, at a time when some corporates are seemingly racking back
- The green economy grew 9% in 2023 and 10% in 2024, whilst the overall economy flat-lined
- Pursuing a low carbon economy drives security and growth

Urban air-quality

- Burning fossil fuels for heat generates CO₂, CO, NO_x, SO_x & particulates (PM_{2.5})
- Approximately 25% (location specific) of urban air pollutants are derived from heating
- Condensing mode operation reduces levels of pollutant emissions
- 25,000 – 35,000 premature deaths per annum are attributed to poor air-quality
- Heat pumps are zero-emissions devices at the point of use



In your own time

- Adopt each technology at the right time
- No premature removal of anything
- Fabric 1st or fabric 2nd ?
- The transmission spine and distribution networks will cope
- Revised EPCs, Connection Readiness Indicator, Smart Building Rating
- There's time, provided that we start **NOW**



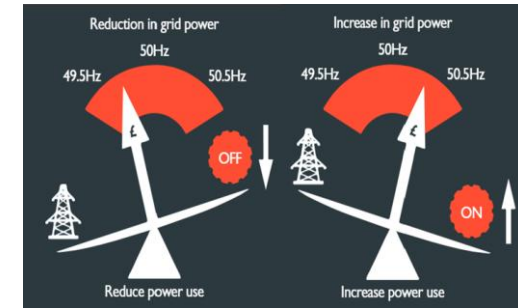
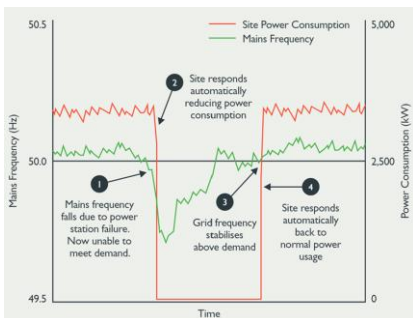
Waste heat

- 2,860TWh waste heat in the EU, almost enough to heat the EU
- Enough waste heat in London for 790,000 homes
- Waste heat & coolth to be designated a pollutant
- Would Local Authorities benefit from a statutory duty to identify & use waste heat?



Flexibility

- National Grid ESO balances the grid
 - Peaking plant is the conventional mechanism for balancing
 - Grid scale battery deployment
 - Capacity Markets
- Load demand management is more cost-effective
 - Reduces generation demand
 - Reduces cable capacity
- Payments for DSM & DSR
 - Thermal storage
- Grids are changing rapidly, with new opportunities to participate

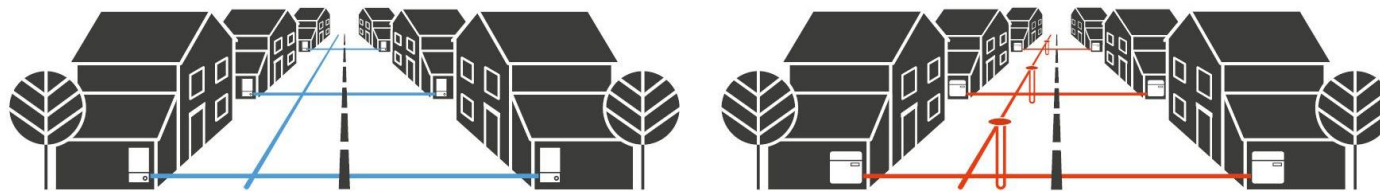


Looking forward to autumn

- Spending Review outcomes
 - Confirmed Warm Homes Plan budget
 - Emphasis on social housing
 - Military housing refurbishment
- Future Homes Standard
- Warm Homes Plan & rebalancing consultation
- DESNZ responses to Boiler Upgrade Scheme consultation
- HM Treasury Budget
- Hydrogen consultation
- MCS 2025
 - Significant improvements to consumer protections

Where next?

- Future Homes Standard, air-source or ground-source with passive cooling & PV
- Air-to-air (potential BUS inclusion)
- “Heat the streets” retrofit



- District heating with waste heat recovery & storage
- Revised PDR
- HEMS



Immediate geopolitical considerations

- Ukraine & Middle East : impact on fuel pricing currently very modest, but could change
- Trump administration : has emboldening the fossil fuel sector & could impact the hydrogen debate
- Baku COP29 : debated finance, no intentions to phase out fossil fuels (COP30 in Brazil?)
- How will the insurance sector react to increase climate & weather related impact
- How will the finance sector influence decarbonisation

Government mixed messaging & confused consumers

- Ban on replacement fossil fuels off-gas - Delayed
- Action on electricity pricing - Delayed
- Future Homes Standard - Delayed
- Ban on the sale of ICEs - Who knows?
- Warm Homes Plan & Boiler Upgrade Scheme - Budget risk
- But
 - enhanced Permitted Development Rights - Delivered
 - BUS - Extended



Credit : Rochak Shukla

Social good, if we choose to take the opportunity

- Warm Home Prescription, started in 2021 with just 28 homes, expanding to 823 in year two
- In 2023, home energy upgrades were included
- Cost of home heating ~ £1,200/annum, cost of a hospital bed ~ £400/day, cost in ICU ~ £1,750/day
- Carbon credits are now available for domestic decarbonisation with funds available for social good



Help is at hand

- <https://www.getaheatpump.org.uk/>
- <https://www.visitaheatpump.com/>
- <https://www.gov.uk/check-heat-pump>
- <https://www.hpf.org.uk/advice/homeowners>
- <https://www.which.co.uk/reviews/ground-and-air-source-heat-pumps/article/guides>
- <https://energysavingtrust.org.uk/energy-at-home/heating-your-home/heat-pumps/>
- <https://www.youtube.com/@HeatGeek>



Department for
Energy Security
& Net Zero



energy
saving
trust

nesta

Which?

Heat  Geek

HPF 
HEAT PUMP FEDERATION

The Prime Minister's role

- The simple message must come from the very top, and only has to be said once, but with conviction
- We can do it
- We can make it affordable
- We can ensure that no one is left behind
- "We can bequeath our children a greener planet and a more prosperous future"
- "There really is room for hope"



... & finally, a shameless plug

- <https://podcasts.apple.com/gb/podcast/the-happy-heat-pump-podcast/id1787675196>
- https://open.spotify.com/show/3xGCOyx90e5XuGFn4kFq00?si=FFiwAZOsT_iJwSrOUr_oBg
- <https://youtube.com/@happyheatpumppodcast?si=ywJurLpWu4ahxU7P>



Thank you

www.hpf.org.uk

<https://www.hpf.org.uk/advice/homeowners>

Bean Beanland

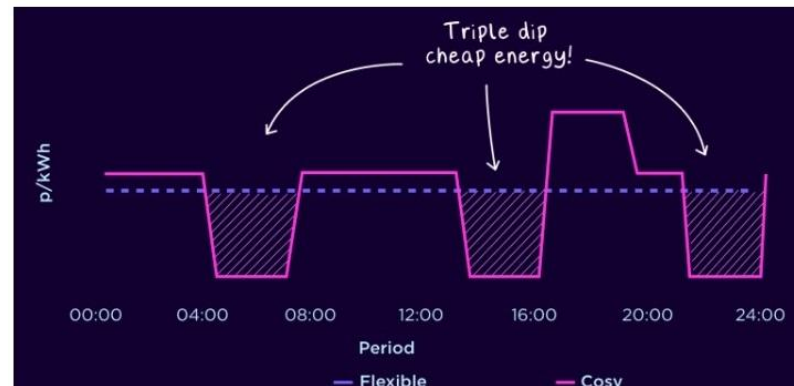
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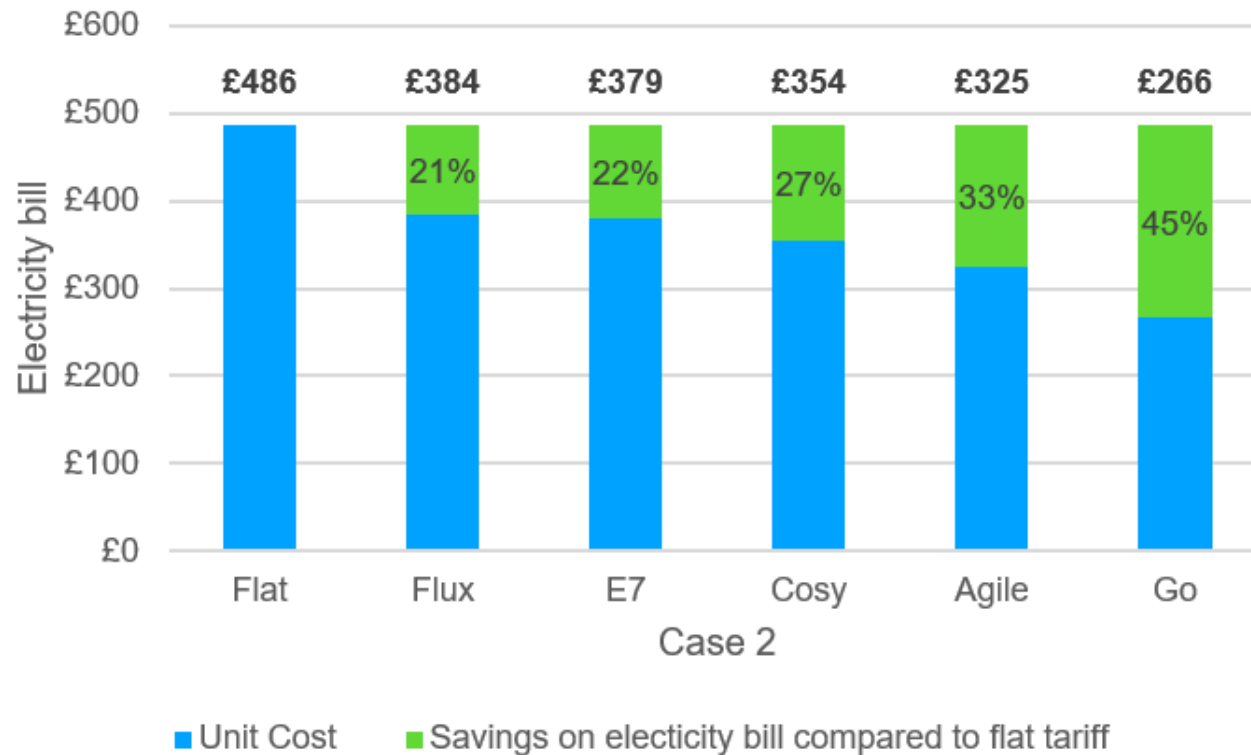
Combining technologies for financial gain

- The value stack is dramatically impacted through combining LCT technologies



Consumer driven value add

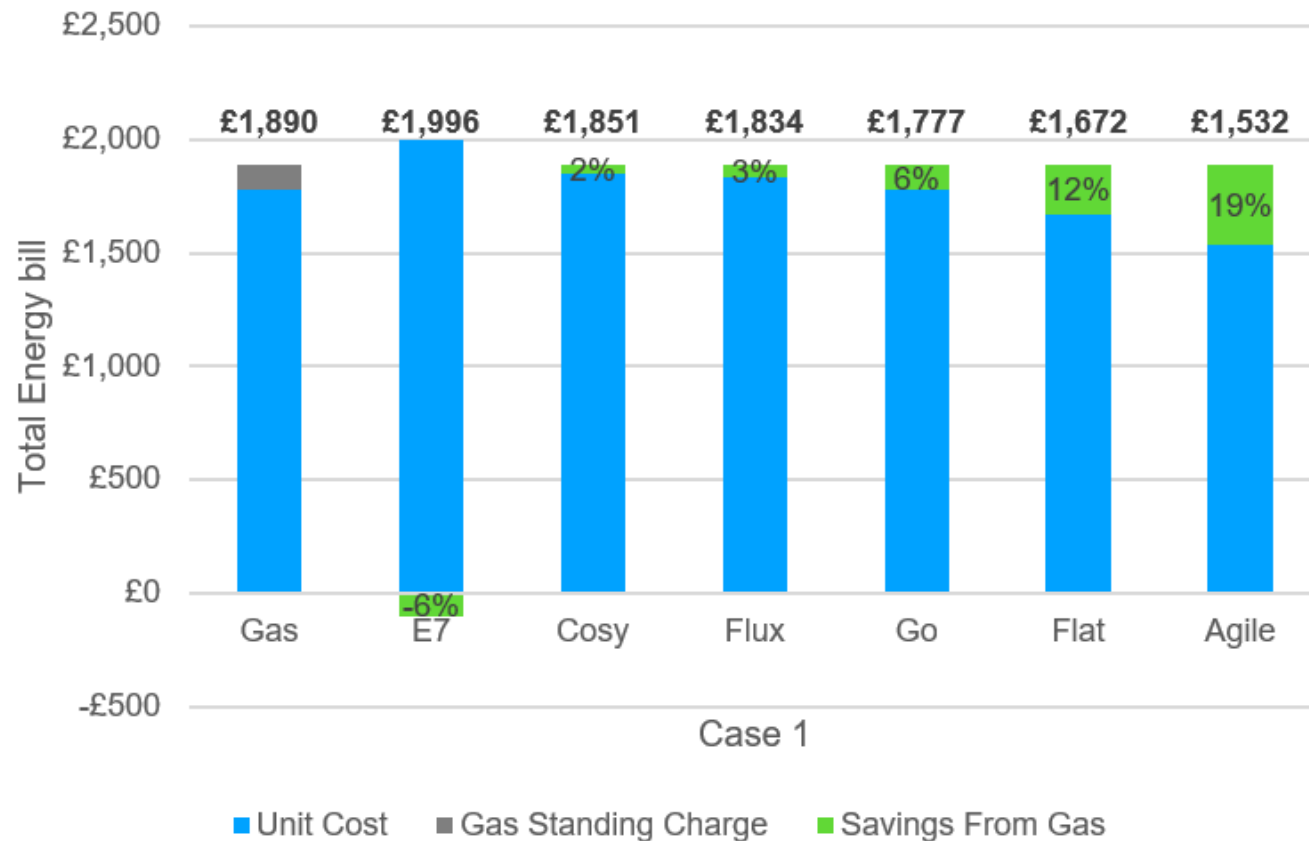
- Adding a 4kWh battery and moving to a smart tariff (with no solar or heat pump included) – electricity bill only



Source: Ben Whittle

Consumer driven value add

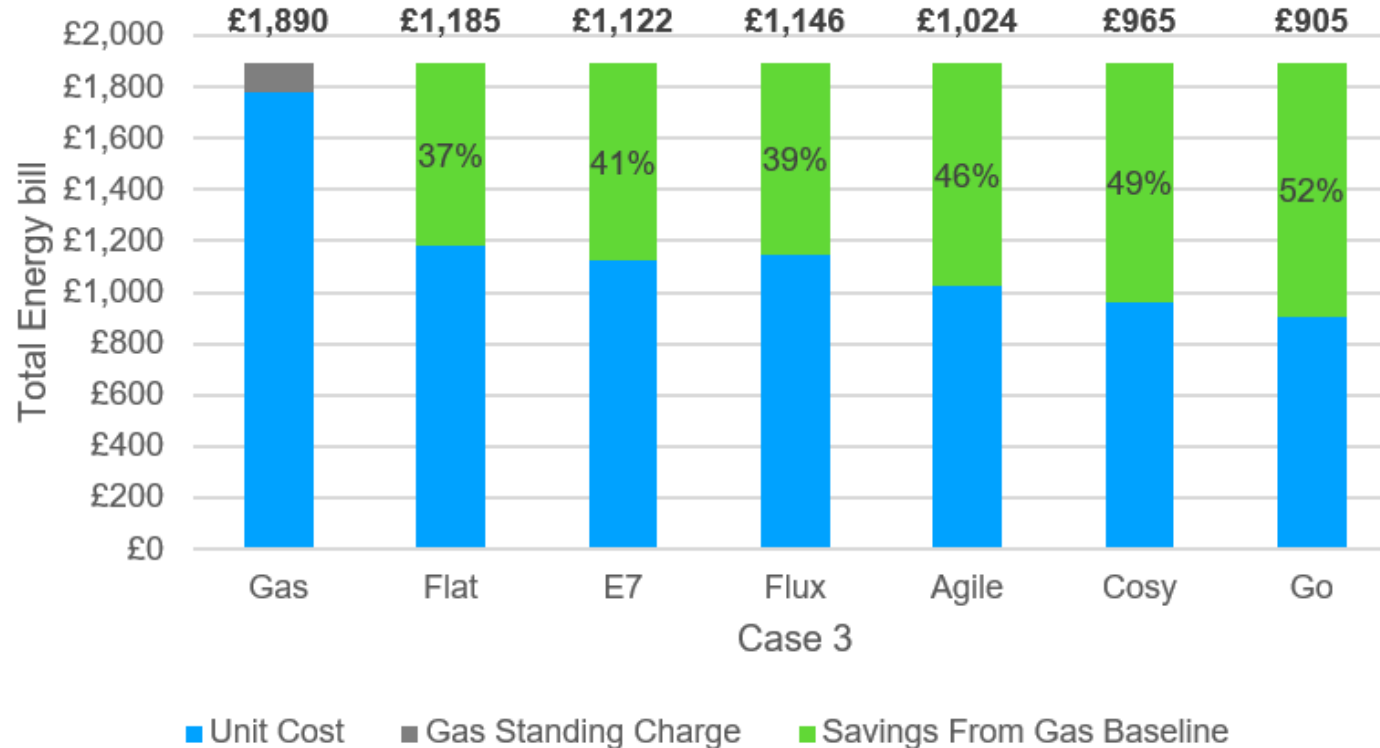
- Switching to a heat pump in a typical house and using a smart tariff



Source: Ben Whittle

Consumer driven value add

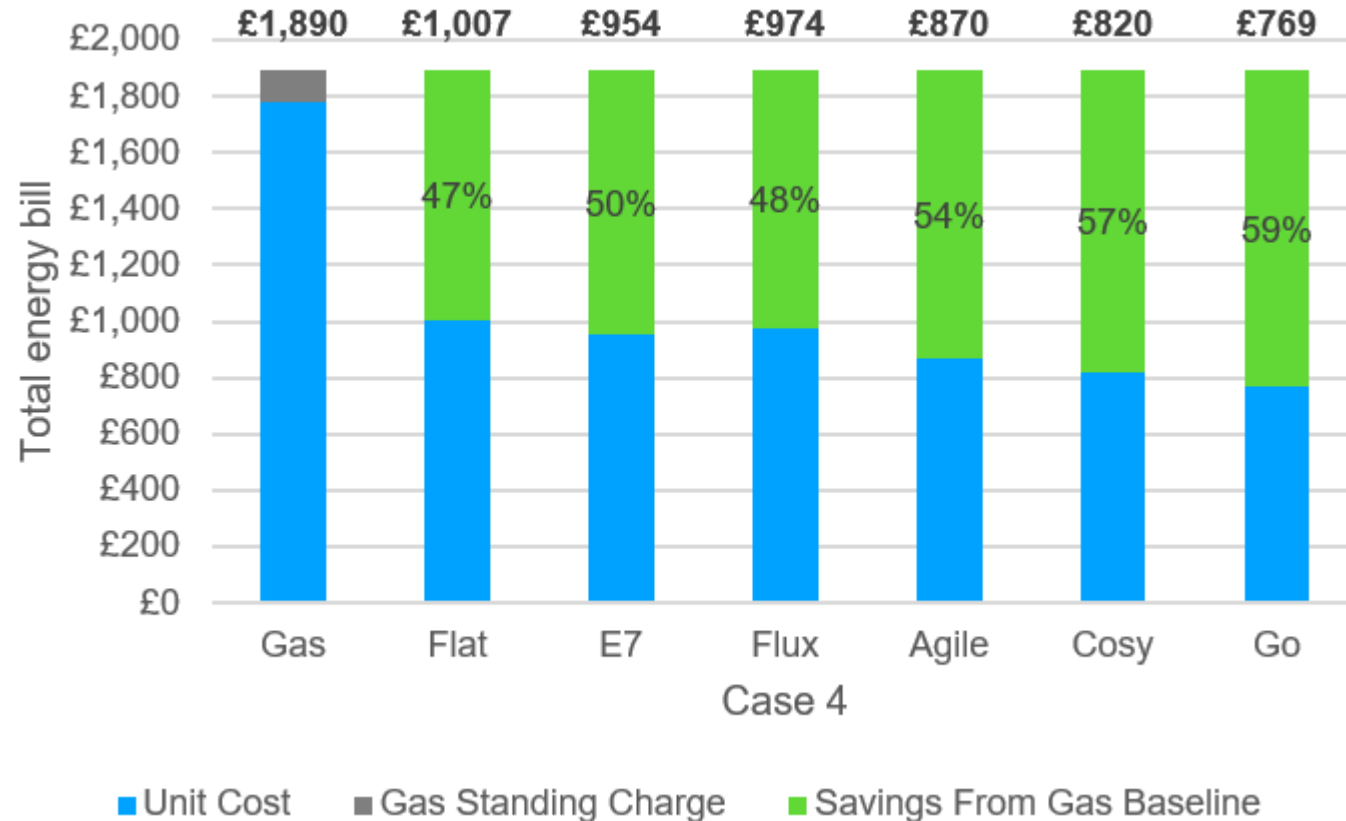
- A typical house with a 9kWh battery (£7,000), heat pump, solar and smart tariff



Source: Ben Whittle

Government & consumer driven value add

- A typical house with a 9kWh battery (£7,000), heat pump, solar and smart tariff – **tariffs on electricity removed**



Source: Ben Whittle