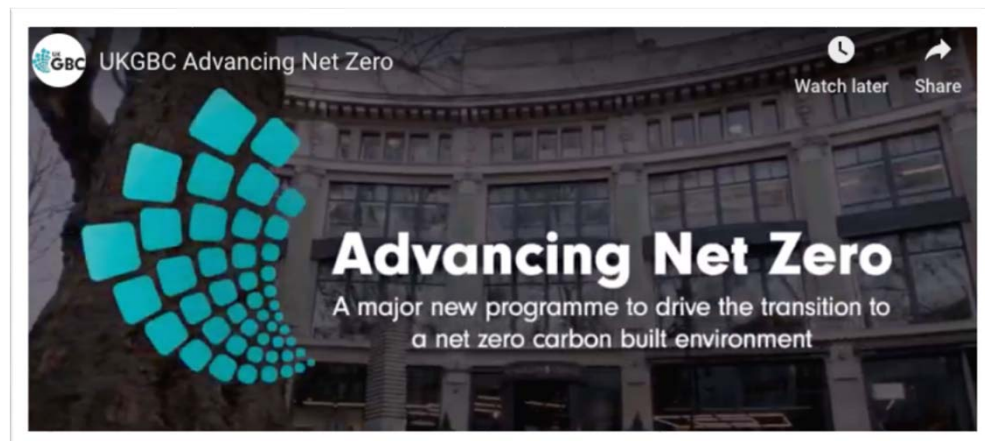




Passivhaus 2030: Responding to the Climate Emergency

NEWS: 19 cities pledge to make new buildings net zero carbon by 2030



Agenda

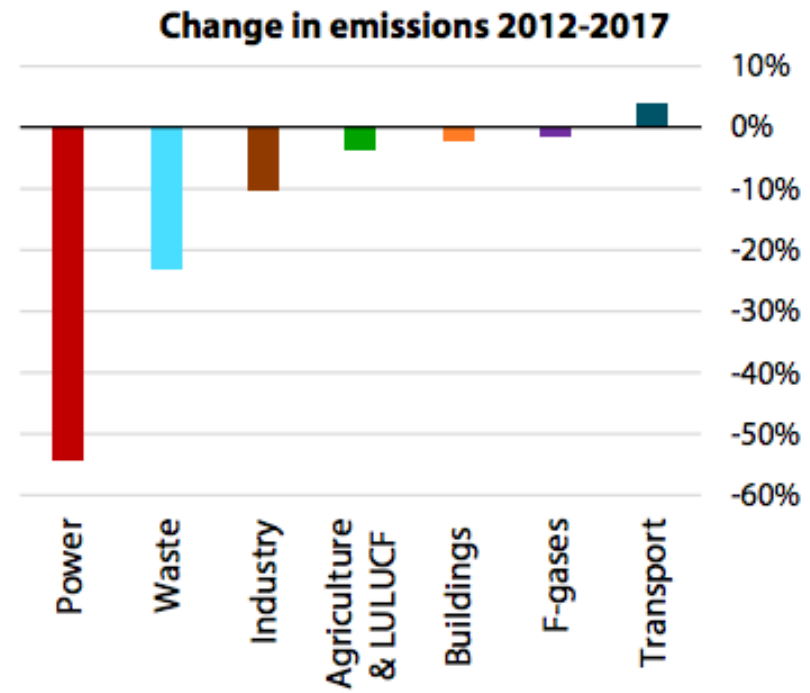
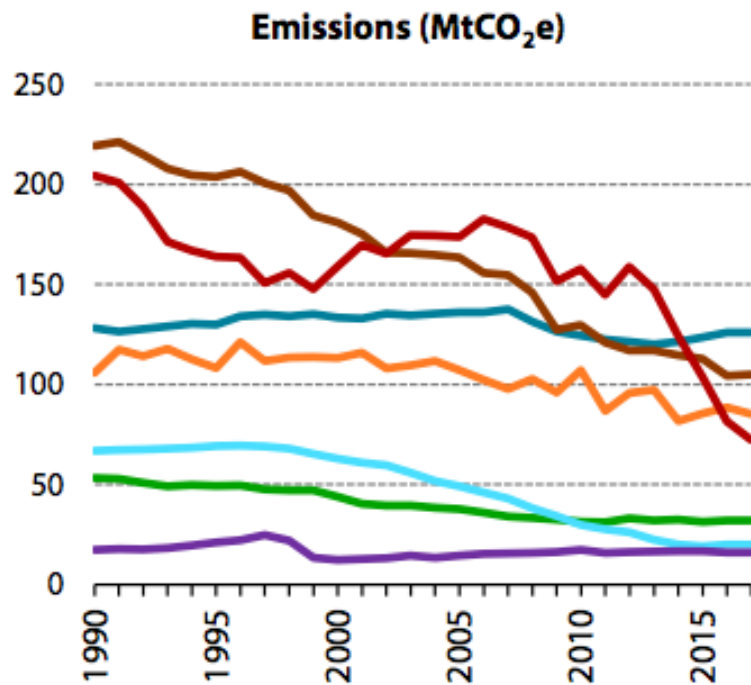


- The Challenge
- What is Passivhaus?
- Where are we now and where do we want to get to?
- The problems ...
- How could we do this?



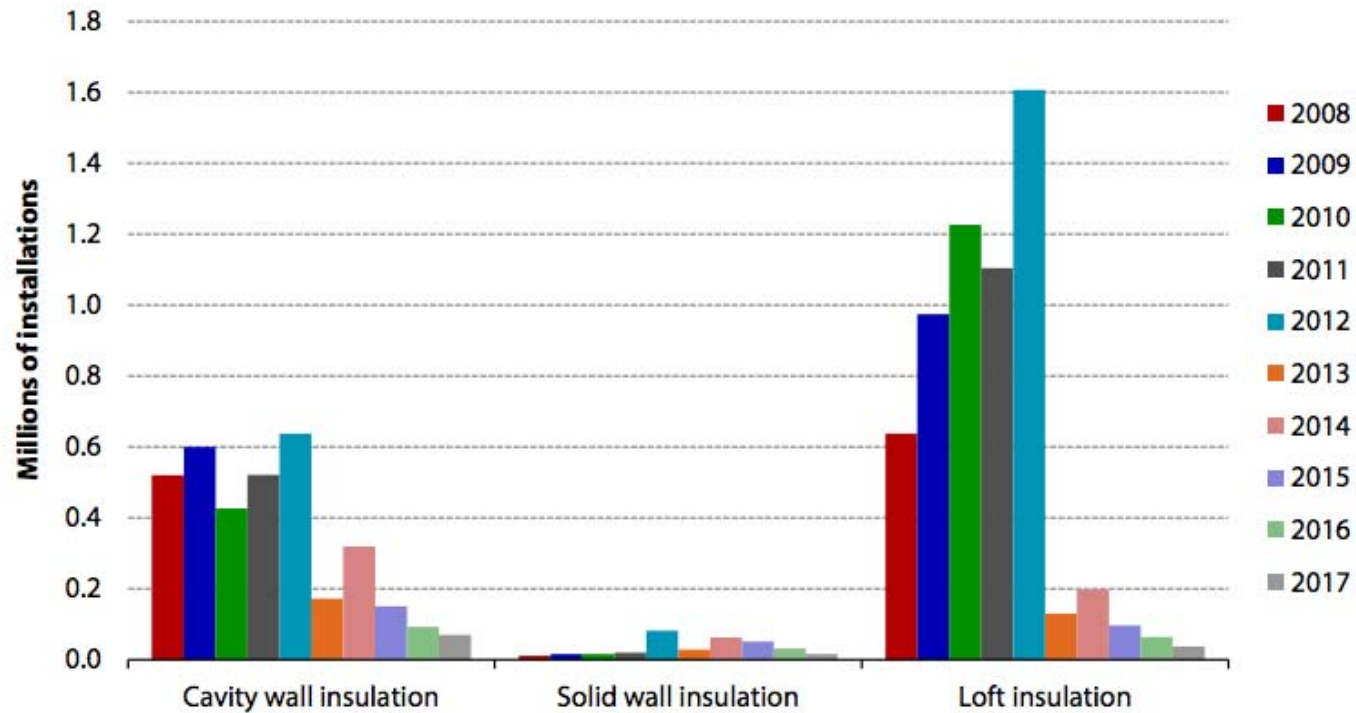
The Challenge

The Challenge



Building emissions are no longer reducing ...

The Challenge

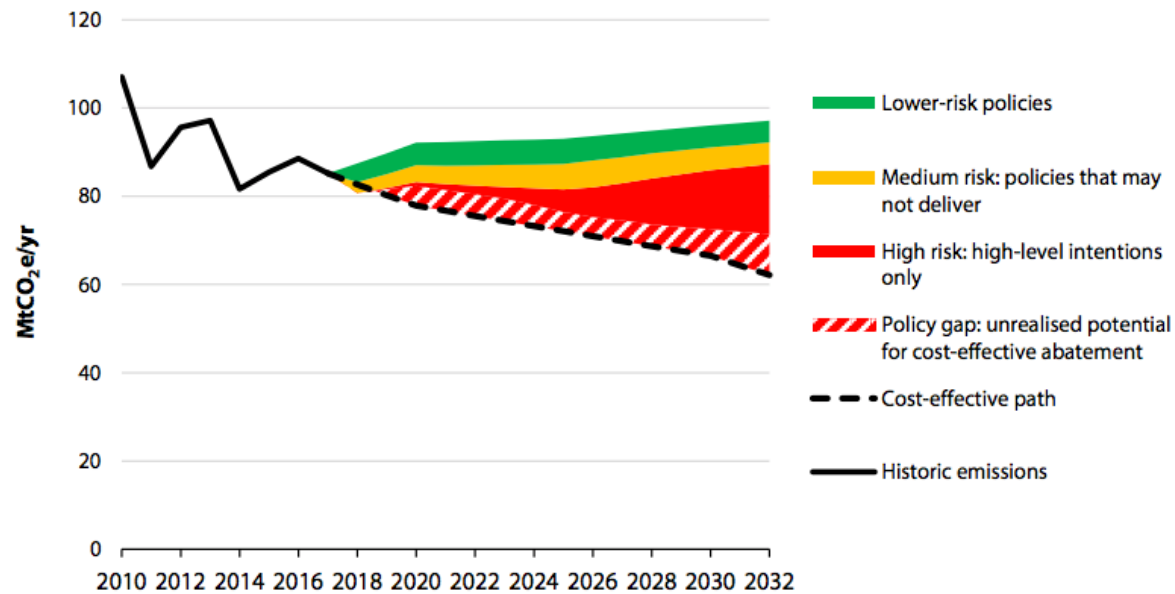


... all the low-hanging fruit has been taken ...

The Challenge



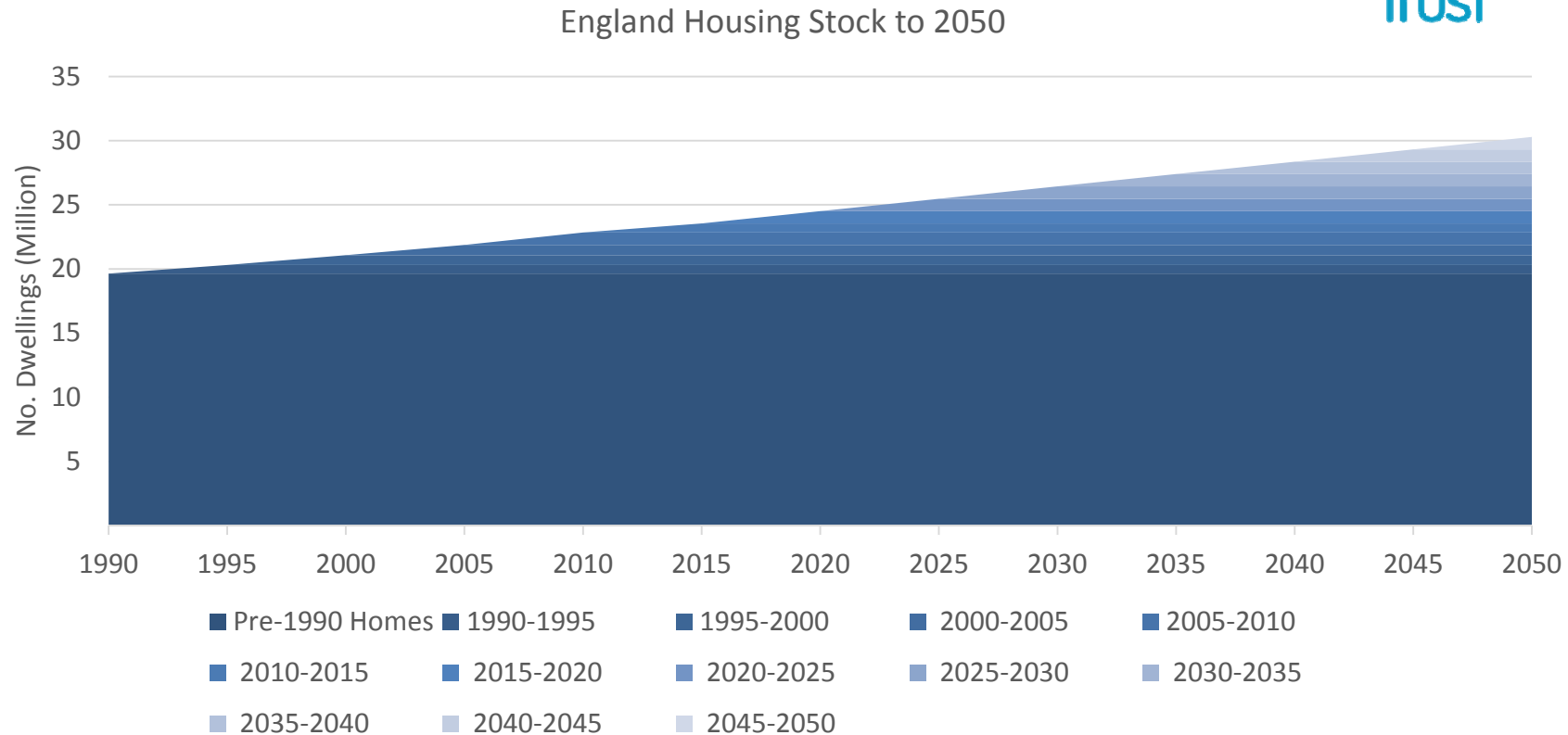
Policy impacts on Building Emissions



... and we're not going to meet our targets with current policies

Source: UKCCC Reducing UK emissions – 2018 Progress Report to Parliament, Published 28 June 2018

The Challenge



Existing Housing Stock is the real challenge ...
74% of 2030 housing stock built before 1990
65% of 2050 housing stock built before 1990

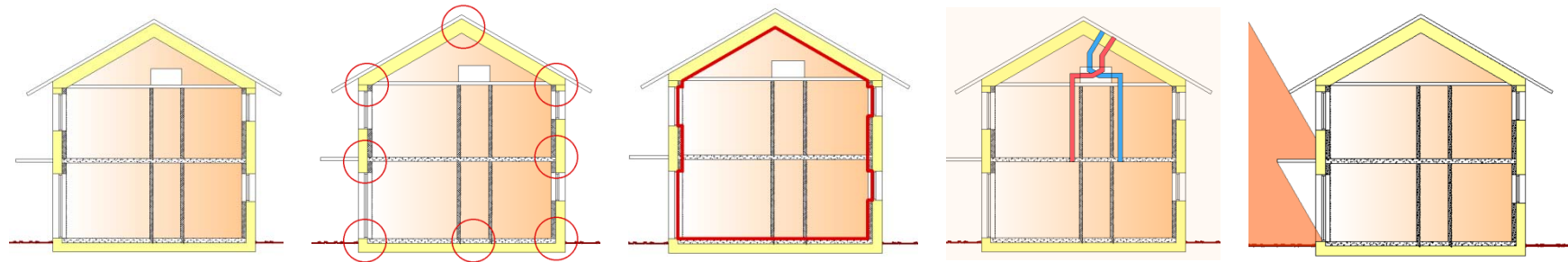
Source: Uk Government Dwelling Stock Tables <https://www.gov.uk/government/statistical-data-sets/live-tables-on-dwelling-stock-including-vacants> Accessed Sep 18



What is Passivhaus?

Passivhaus

How is it achieved?



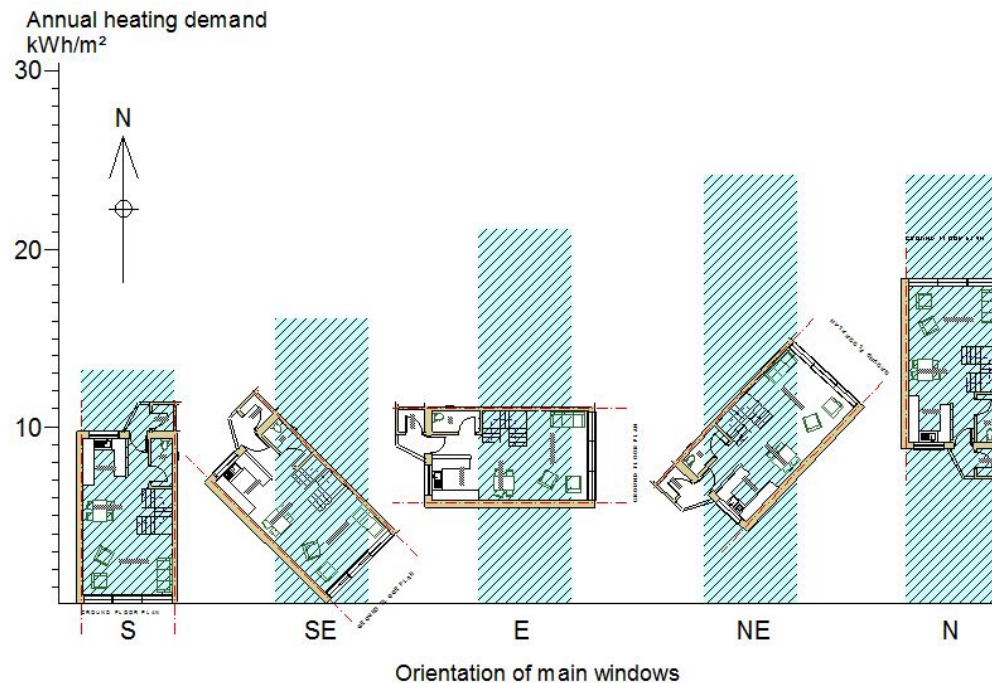
- Consumer-led standard which minimises heating and cooling demand by optimising fabric performance
- High levels of insulation
- Minimal thermal bridging
- Continuous air barrier to achieve exceptional airtightness
- Provide controlled ventilation and heat recovery during heating season with MVHR. Can use natural ventilation in summer.
- Maximise use of solar and internal heat gains & protect against overheating.

Passivhaus

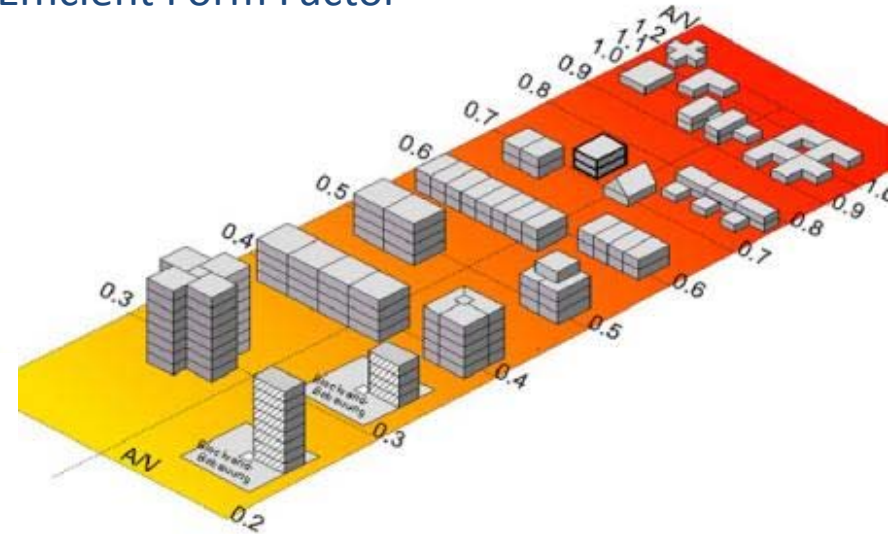
How is it achieved?



Site & Orientation



Efficient Form Factor



- Dedicated software package
- Accurate climate data
- Focus on heating/cooling
- Not related to SAP

Passivhaus

How is it achieved?

A quality assured process with Certification for:



Buildings

- Through UK based certifiers



Products / Components

- Through Passive House Institute
- Is a demonstration of performance but not required (except for MVHR systems)



Designers / Consultants

- Through CEPH courses
- List of CEPH designers / consultants on the PH Trust website



Tradesmen / Installers

- Through Certified Tradesman courses

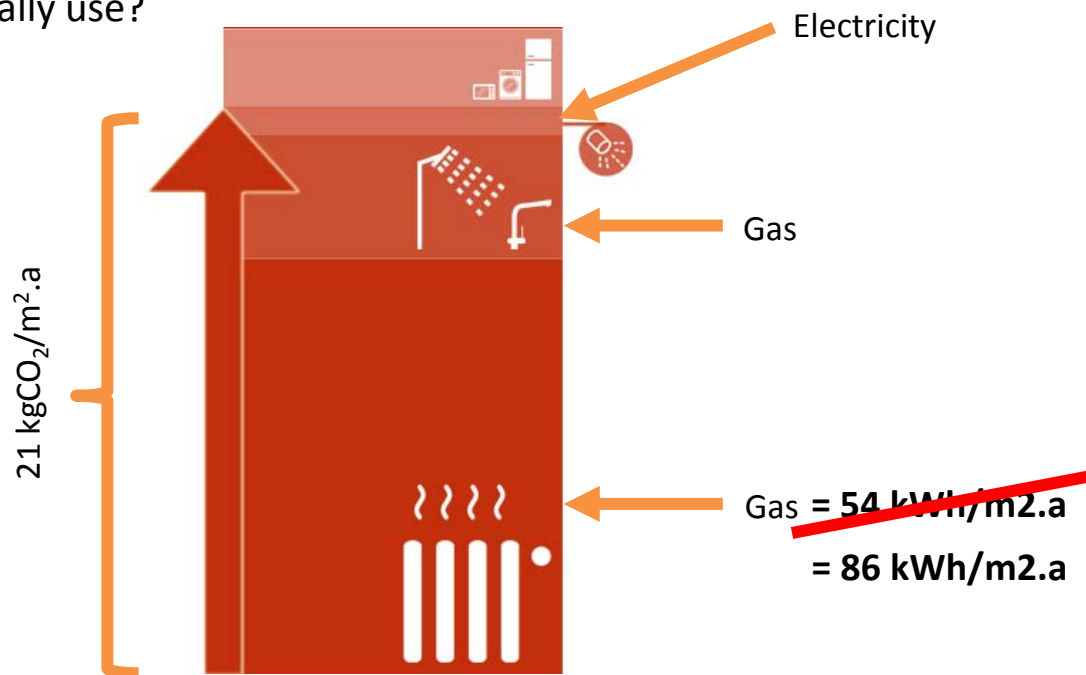
Building to Passivhaus Principles is NOT the same as building to Passivhaus Standard!



Where are we now and where do we
want to get to?

Where are we now?

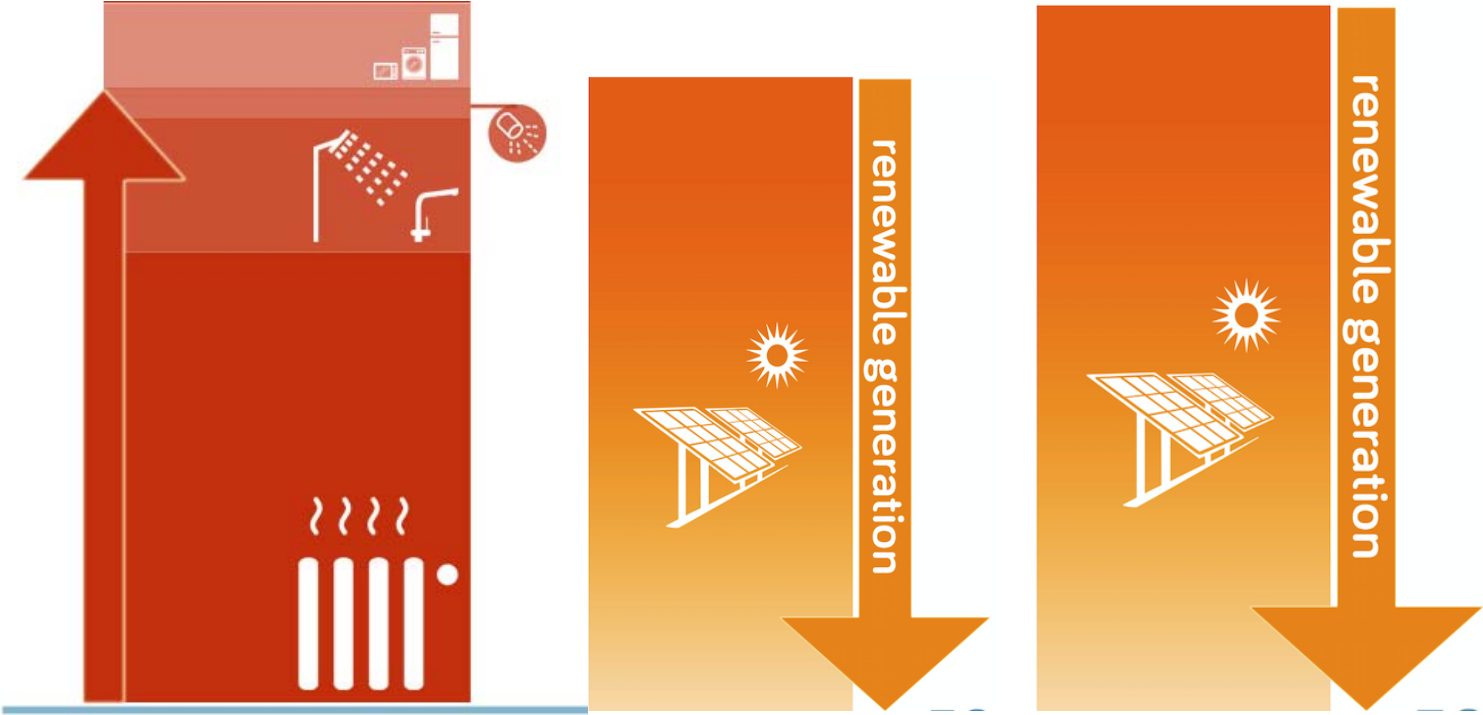
How much energy
does an average
'Building Regulations'
house actually use?



Where do we want to get to?



Zero Carbon?





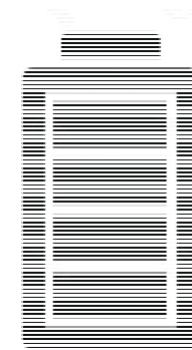
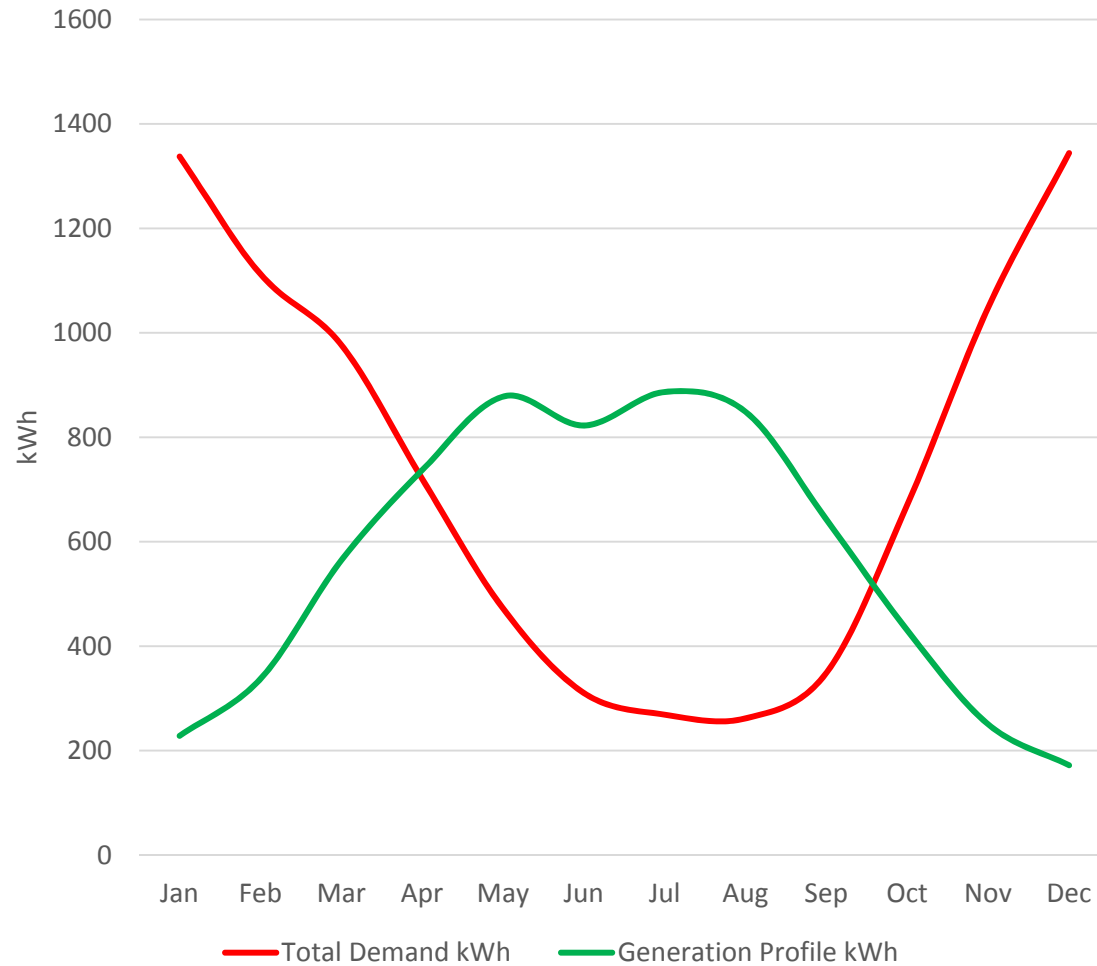
The Problems ...

Problems ...

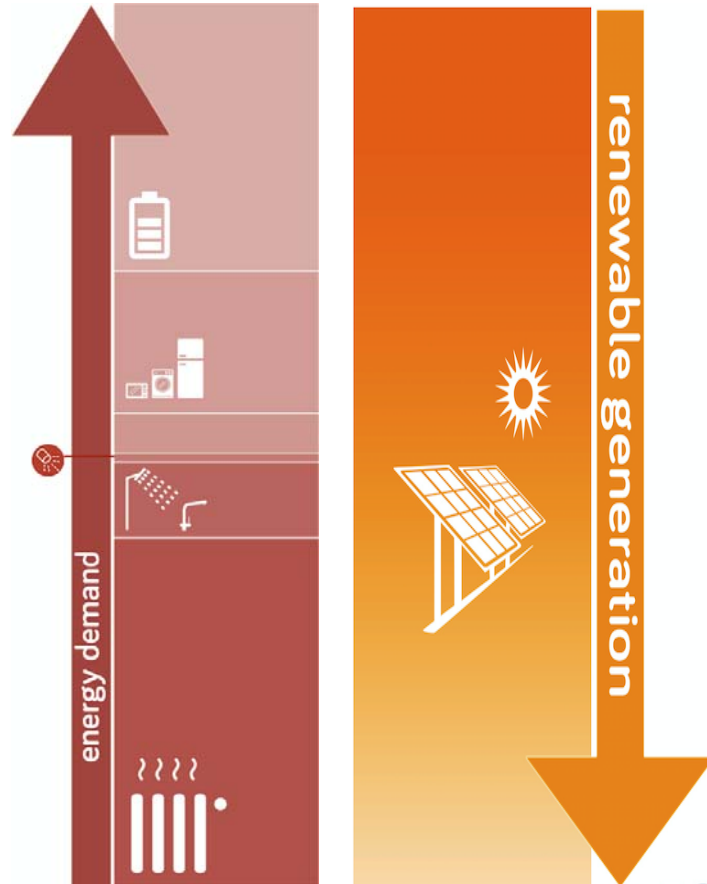


- Renewable energy doesn't always come when you want it
- Grid loading and decarbonisation
- How much renewable energy is there?

Renewable Energy



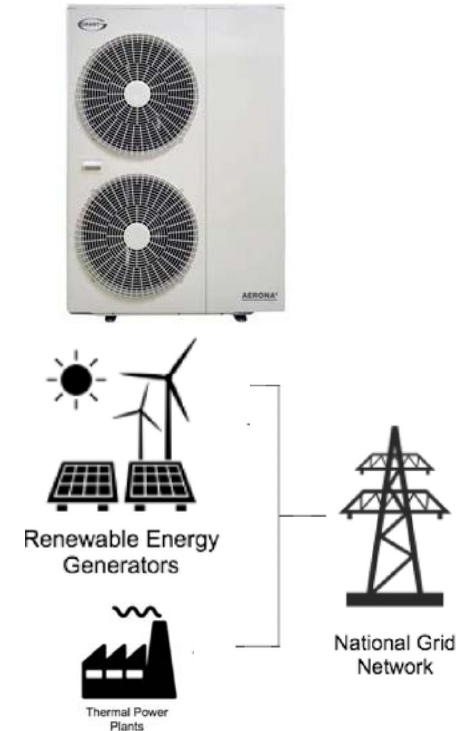
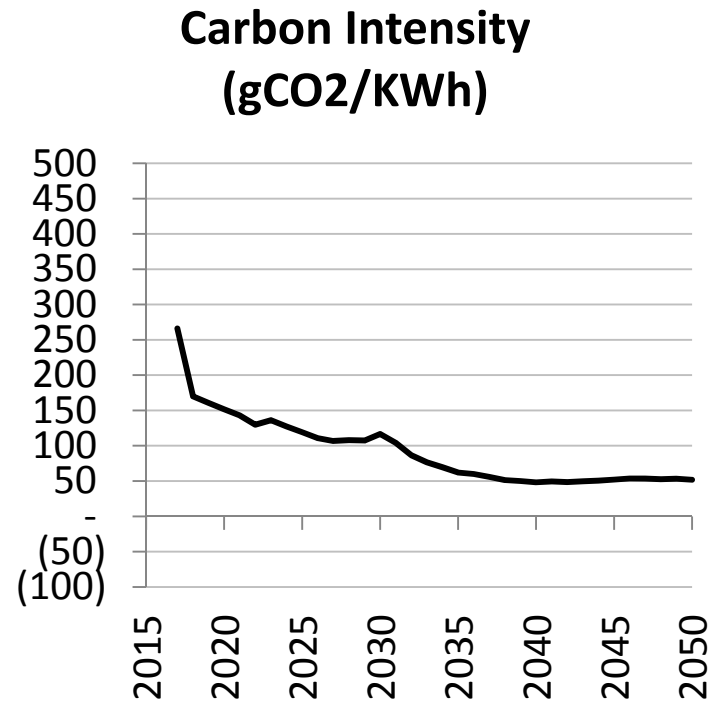
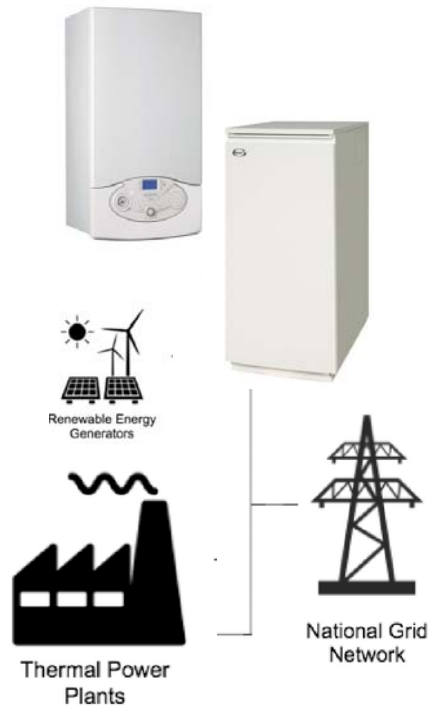
So real net zero is



How much renewable energy?

Achievable?

So just decarbonise the grid ...

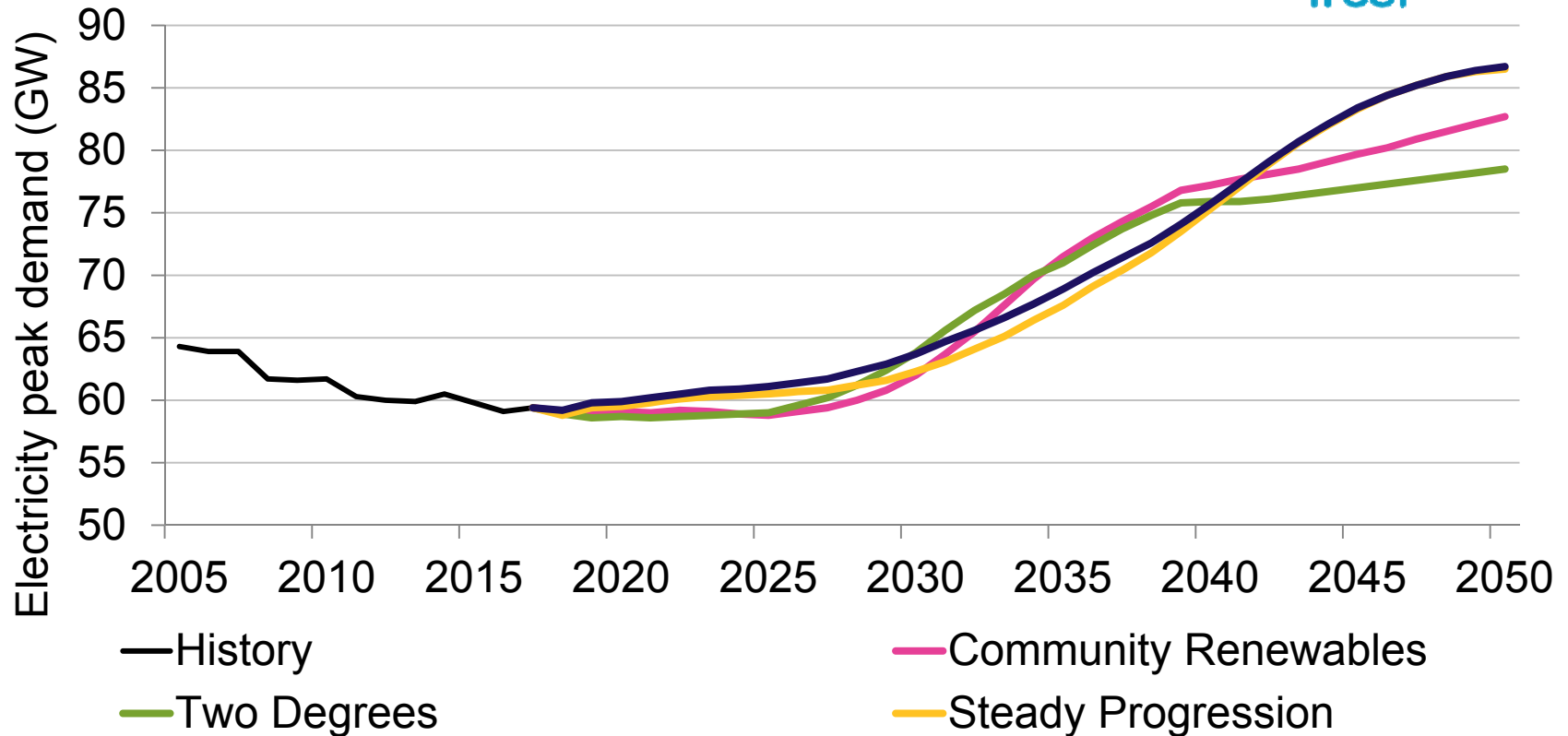


So just decarbonise the grid ...



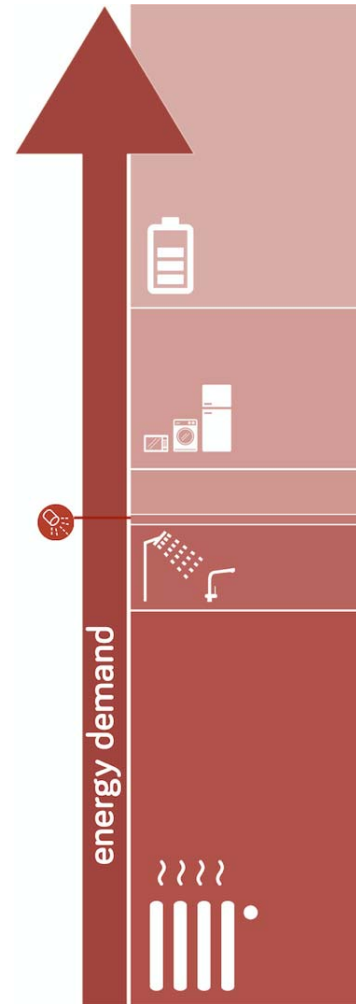
- 26M Homes in the UK – most heated by gas or oil
- Need to move many of these to use electricity for both to be able to capitalize on grid decarbonization ...
- The rest ... low carbon heat?
- That's a huge additional load on the grid ...
- E.g. 5kW additional load per household is up to an additional 130GW ... is that a lot?

So just decarbonise the grid ...



... just relying on grid decarbonization would require a massive increase in grid peak load capacity

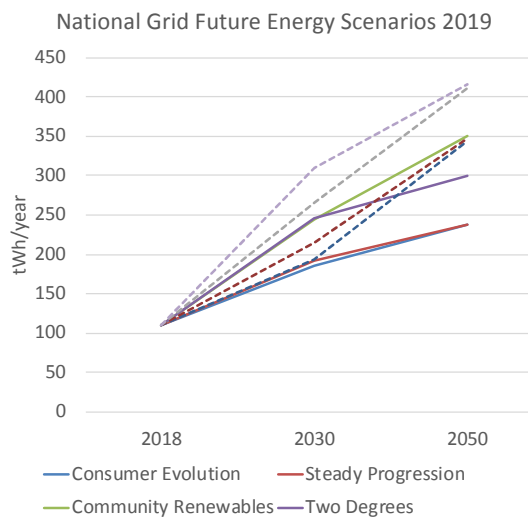
So we need to minimise load



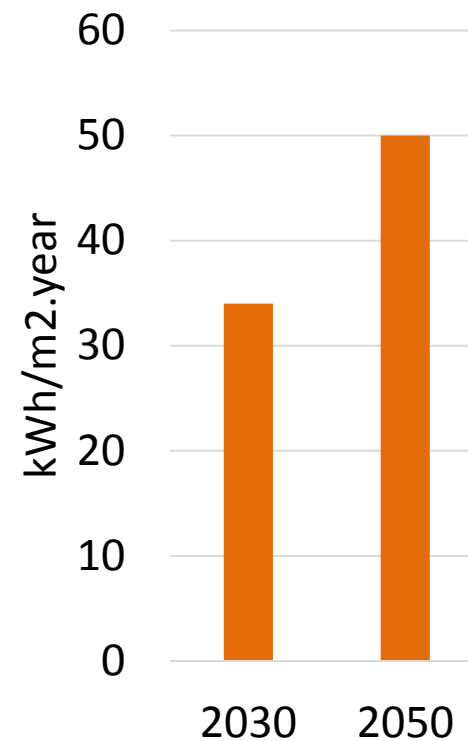
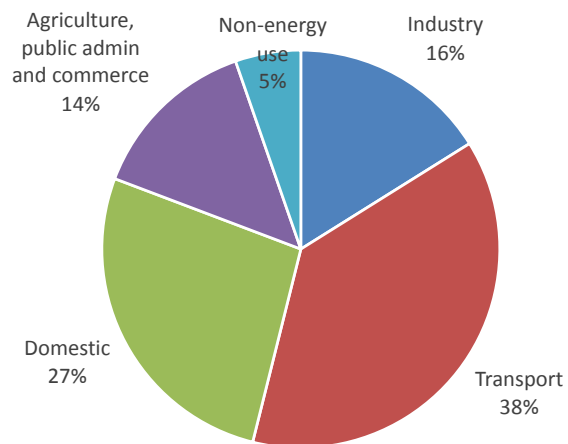
Available Renewable Energy



Best scenario, plus nuclear:
310 tWh in 2030, 416 tWh in 2050



Domestic dwellings - 27% of generation



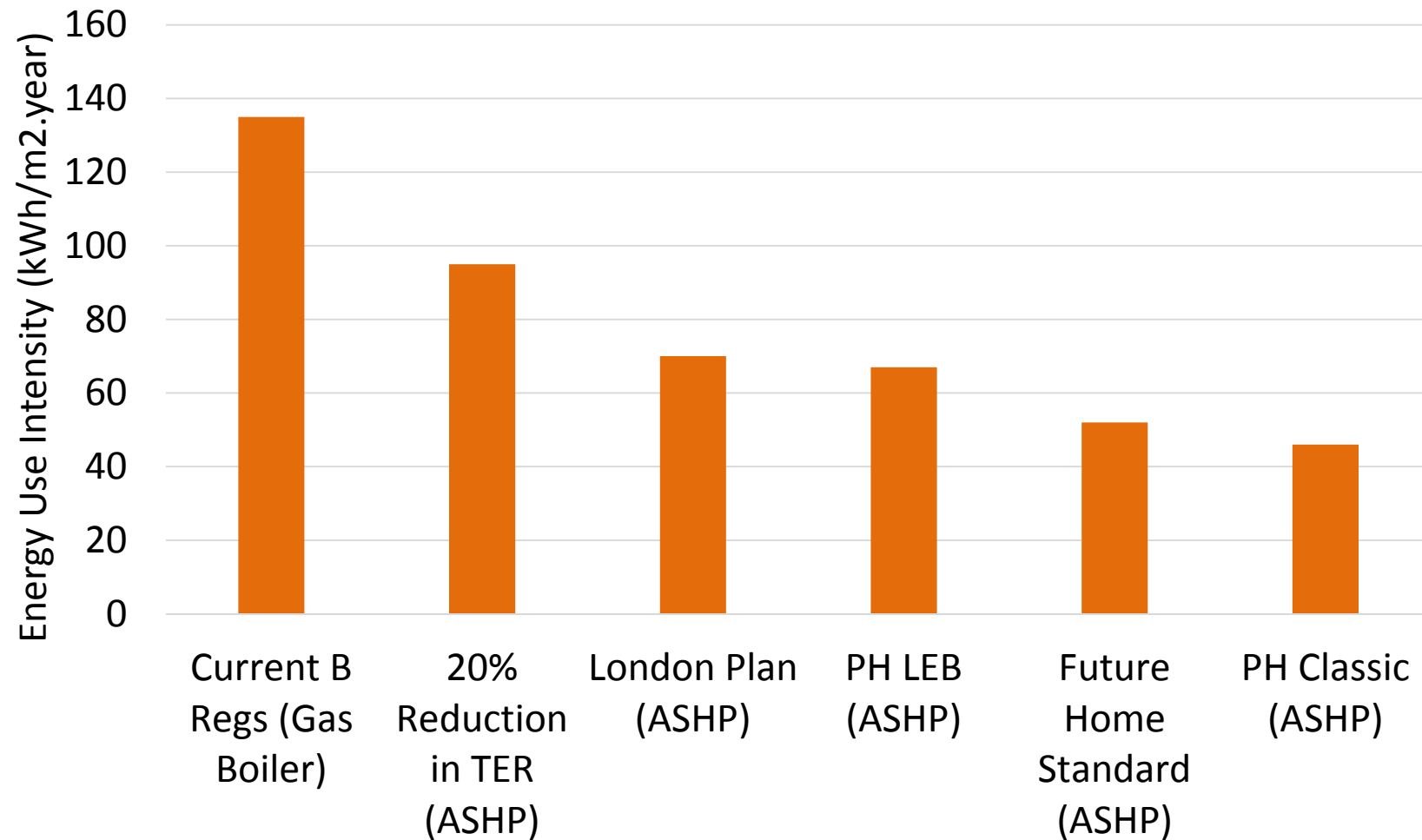


How could we do this?

How could we get there?



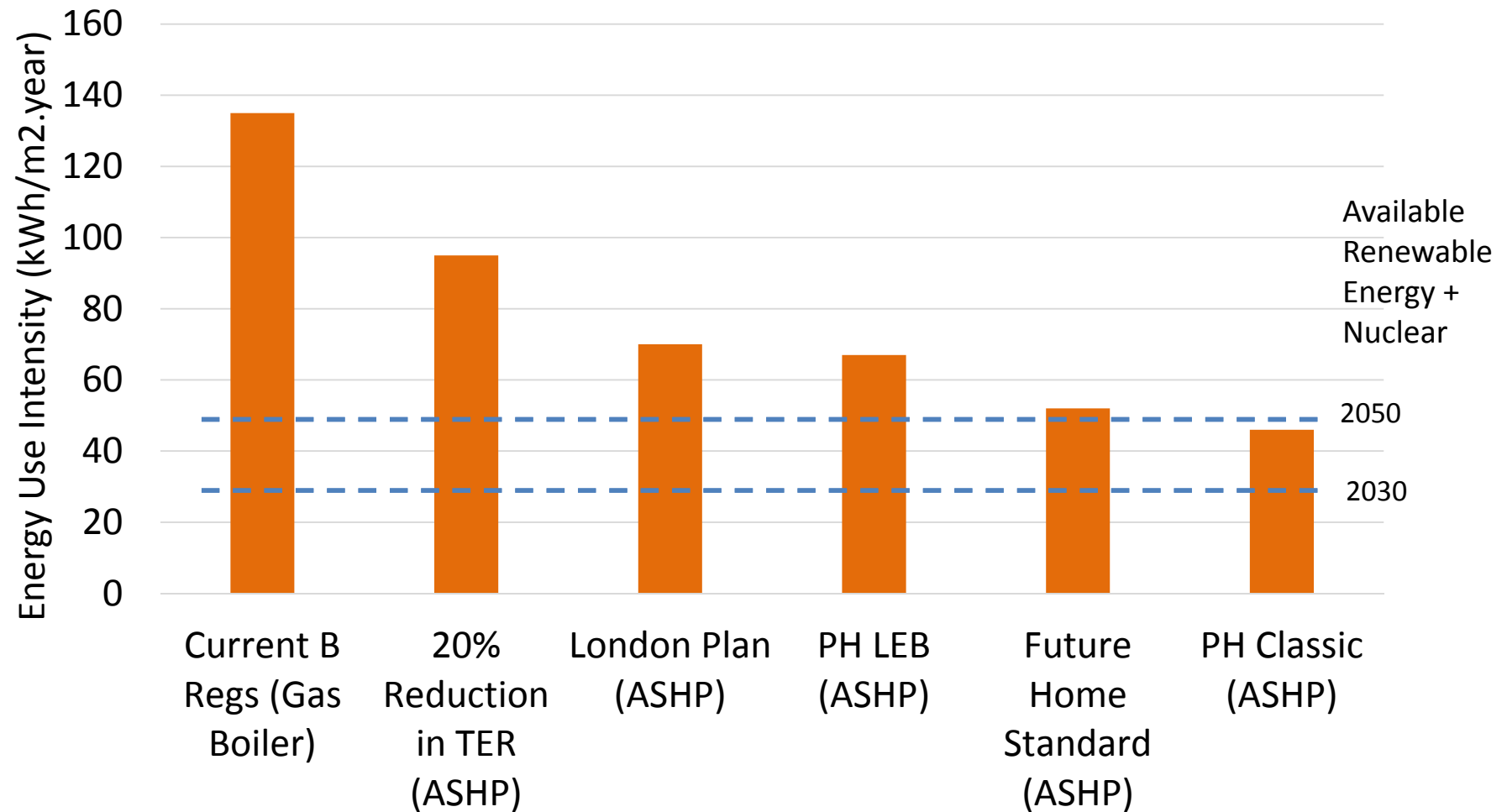
Energy Use Intensity (EUI)



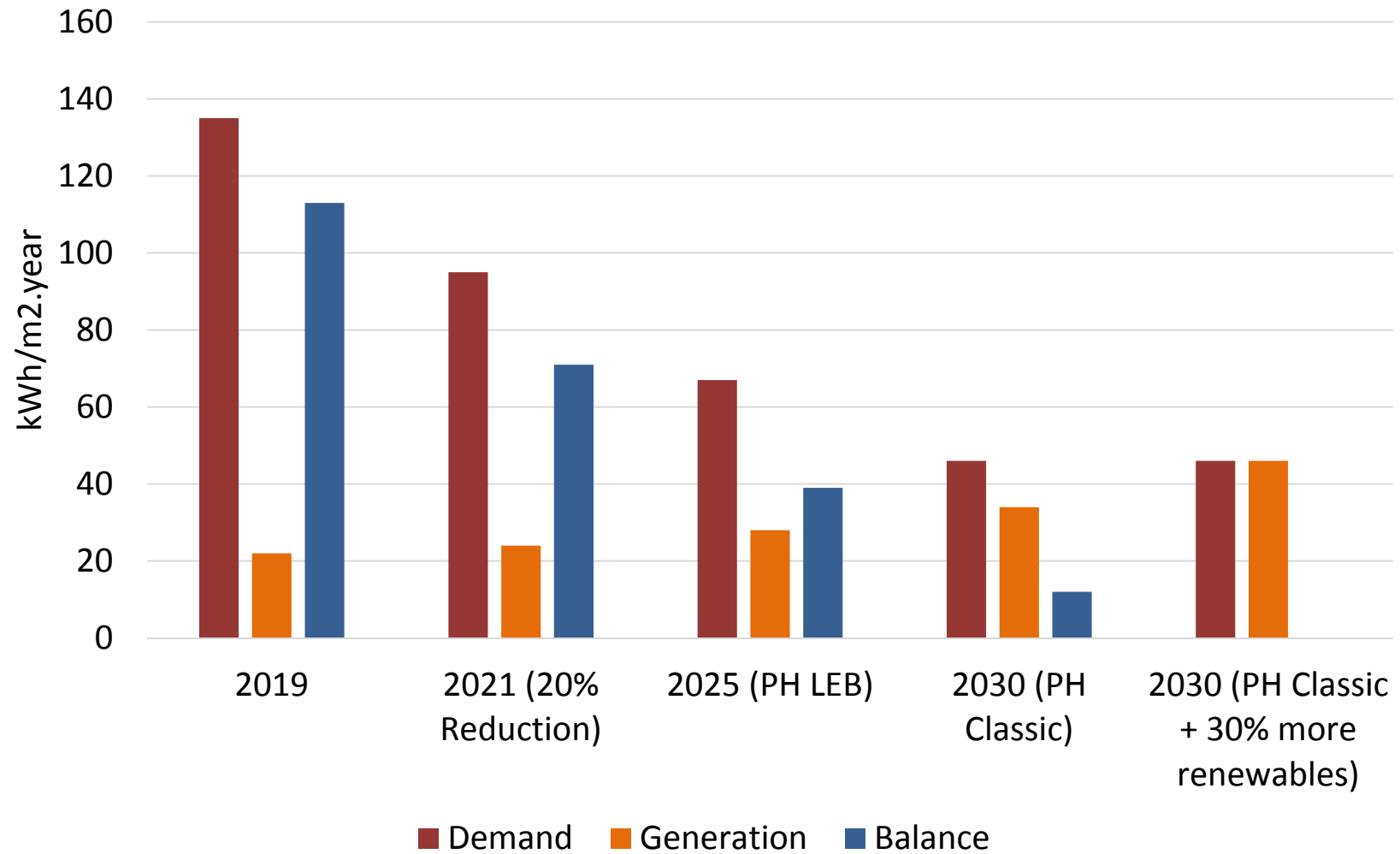
How could we get there?



Energy Use Intensity (EUI)



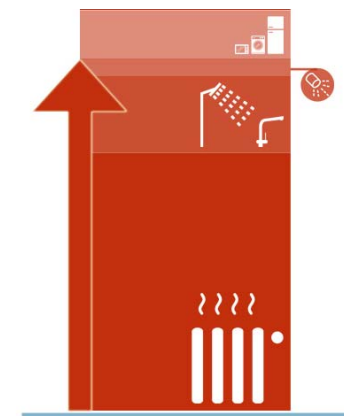
Getting to 2030 ...



So ... to summarise



- To have any chance of getting to Net Zero, we need to build and renovate to high levels of fabric efficiency - Passivhaus ... or beyond?
- Maximise renewable generation – we need more than we're planning for 2030 ...
- Grid decarbonization will help ... but it isn't a silver bullet





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