

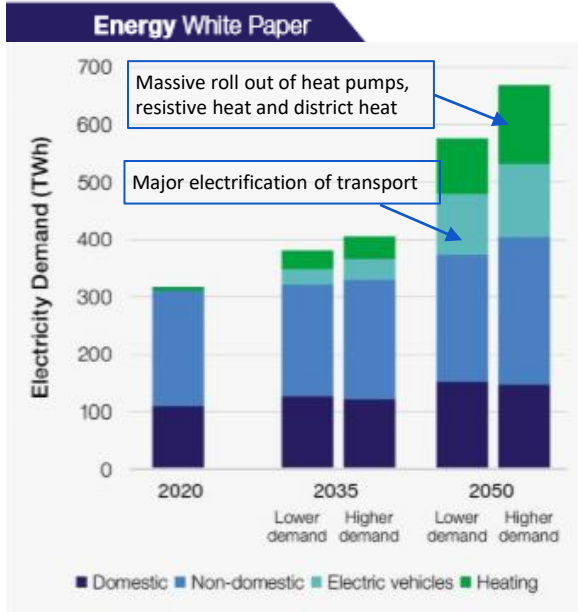
# Powering the zero carbon economy

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# Policy must be designed to deliver against the major challenges of rapidly increasing electricity demand and the required diverse low carbon asset build

BEIS analysis shows electricity demand will more than double



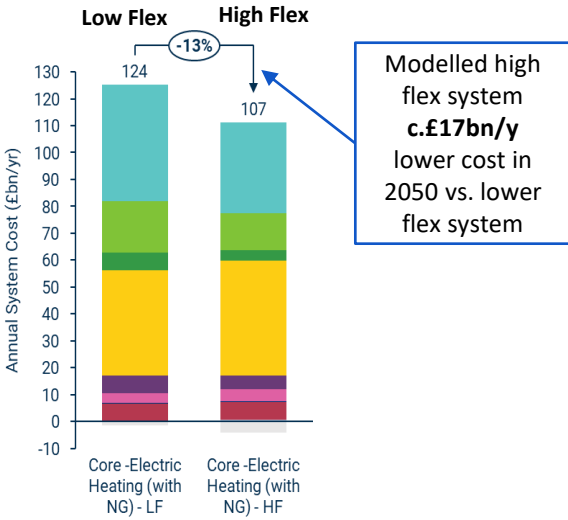
There will need to be a massive increase in low carbon generation, some of which relies on innovation\*

	Capacity, GW
Wind	110 (23GW today)
Nuclear	20 (SZB + HPC = 4GW)
Solar	40 (13GW today)
CCGT-CCS	20 (none today)
Unabated gas	60 (replacement)
Interconnectors	20 (6GW today)
H2 turbines	20 (none today)
Storage	10 (4GW today)

Cost of capital is a critical driver in delivering this capital intense programme. A 3% difference in cost of capital would impact consumers by c£11bn pa.

Increasing flexibility will enable overall system costs to be reduced

Imperial College / Carbon Trust 'Flexibility in GB' net zero modelling [2021] electric heating case



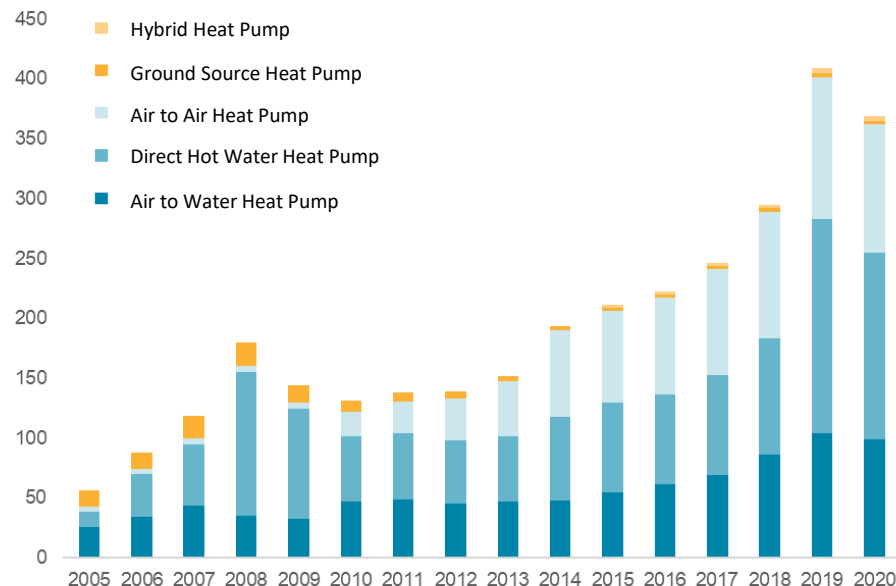
\* Capacities estimated from EWP "Mix B"



# Case Study: France achieved c3m installs of heat pumps through subsidies, building regulations and a carbon tax. Potential for huge UK industry growth.

- Key policy drivers of heat pump adoption:
  - Supplier obligation for insulation and heat decarbonisation (similar to ECO)
  - Carbon tax on final uses of all CO2 emitting fuels, incl. heating and transport
  - Grants for insulation + heat decarbonisation
  - From mid 2021: Ban on fossil fuel boilers in new build
  - From 2022: oil boiler retrofit ban
- Customer experience is supported by simple and timely access to funding. Suppliers encouraged by supported by timely payments for completed projects
- UK targets requires a doubling as early as 2023 of the UK's 3,200 installers currently qualified. By 2030, that skills base could rise to over 50,000 specialists.

France annual heat pump installations for space/water heating (incl. non domestic), (000s)



## Case Study: Hinkley Point C - Net Zero in action with impactful economic results

- Over 3,600 British businesses are part of Hinkley Point C's supply chain, with more than 1,300 businesses from the South West.
- Direct economic benefit to the region now at over £3 billion - double the original target.
- £123 million of community investment delivered to date.
- Hinkley Point C is helping suppliers to develop their capabilities in high quality nuclear engineering
- On track to train 1,000 apprentices with 756 having already been trained.
- Hinkley Point C's Job Service has created 11,769 job opportunities to date.



# Case Study: Sizewell C – Replication benefits and integration of technologies to deliver innovation

- Sizewell C will be a near identical replica of Hinkley Point C in Somerset and, with replication benefits, will be cheaper.
- It will comprise of two UK EPR reactor units, giving a total site capacity of approximately 3,340MW, and will create thousands of skilled jobs and business opportunities:
  - An estimated £4 billion to be contributed to the regional economy
  - A third of the Sizewell C workforce will come from the local area during the construction phase
- Energy from Sizewell C can be part of a local energy hub, with low carbon electricity and heat from the station supporting innovative new technologies:
  - Hydrogen Production – e.g. for local transport use (Freeport East)
  - Direct Air Capture of CO<sub>2</sub> – delivering additional carbon reduction potential



We are **increasing** the number of apprentices we aim to employ from **1,000 to 1,500**



# Case Study: Energy Superhub Oxford – Pivot Power infrastructure project supporting local policies working with local communities

- Supporting Oxford City Council's zero emission strategy, this project aims to showcase an integrated approach to decarbonising power, transport and heat.
- Project consists of:
  - 50MW transmission-connected battery
  - 8km private wire network
  - supplying up to 25MW of power for EV charging
- UK's largest public charging hub at Redbridge Park & Ride.
- Provision of flexibility system services to maintain a secure system.
- The 50MW battery was energised in June. Wider project will complete by ~end 2021.
- The total project is a £41 million investment and will create opportunities for the local supply chain, as well improving local air quality and cutting carbon.



# The UK can learn a lot from its carbon reduction journey progress that will support the difficult decisions ahead

- The UK has reduced emissions by >40% since 1990 thanks to the successful electricity market reform framework, growing low carbon generation and driving coal to the margins.
- There is a need to continually refine policies to ensure that it is informed by past experience and credibility. With evolution, CfD's, carbon pricing and the capacity market can continue to drive further investment and large carbon reductions.
- Transport decarbonisation is now making progress, thanks to the rise of electric vehicles, strong consumer incentives and the visibility of an end date for petrol/diesel cars and vans. We need a similar framework to encourage consumer action on low carbon heating.
- There is still more to do to in a wide range of other areas:
  - Develop and implement framework to encourage flexibility
  - Implement regimes for new nuclear, hydrogen and CCUS
  - Address costs (who pays?), charging (elec vs gas vs tax), and protect customers and businesses through the transition.



# “We need a constructive conversation about energy, not a Punch and Judy show” Professor David MacKay

- **Delivering net zero in the UK is a huge undertaking**, requiring millions of actions in all parts of economy, and £billions of investment. Transition to net zero is a process over next thirty years - not a one-off change.
- **This will require massive action on Government policy**, particularly in the energy industry, and there is not limitless bandwidth or funds for change / development. It is vital to prioritise policy to focus on what will have the most impact, recognising the intricate detail is often also important.
- **We now need to move to real world delivery** – start key infrastructure projects to achieve net zero and commit to bold policy direction.
- The pace of progress needs to increase and build needs to be much faster than we have ever achieved previously. **Let’s use the technology available to us to build at scale right now, as well as continuing to innovate.**
- **Customer engagement and flexibility can drive net zero faster and cheaper**, but we must focus on where the real value is to be had (cost and carbon) and on what is needed to unlock vital change. Customer engagement in the energy sector must become about much more than switching to the cheapest short-term tariff deal.