

# Heat Pump Investment Roadmap

*Leading the way to net zero*

April 2023



HM Government



# The UK is leading the charge towards a net zero, nature-positive future



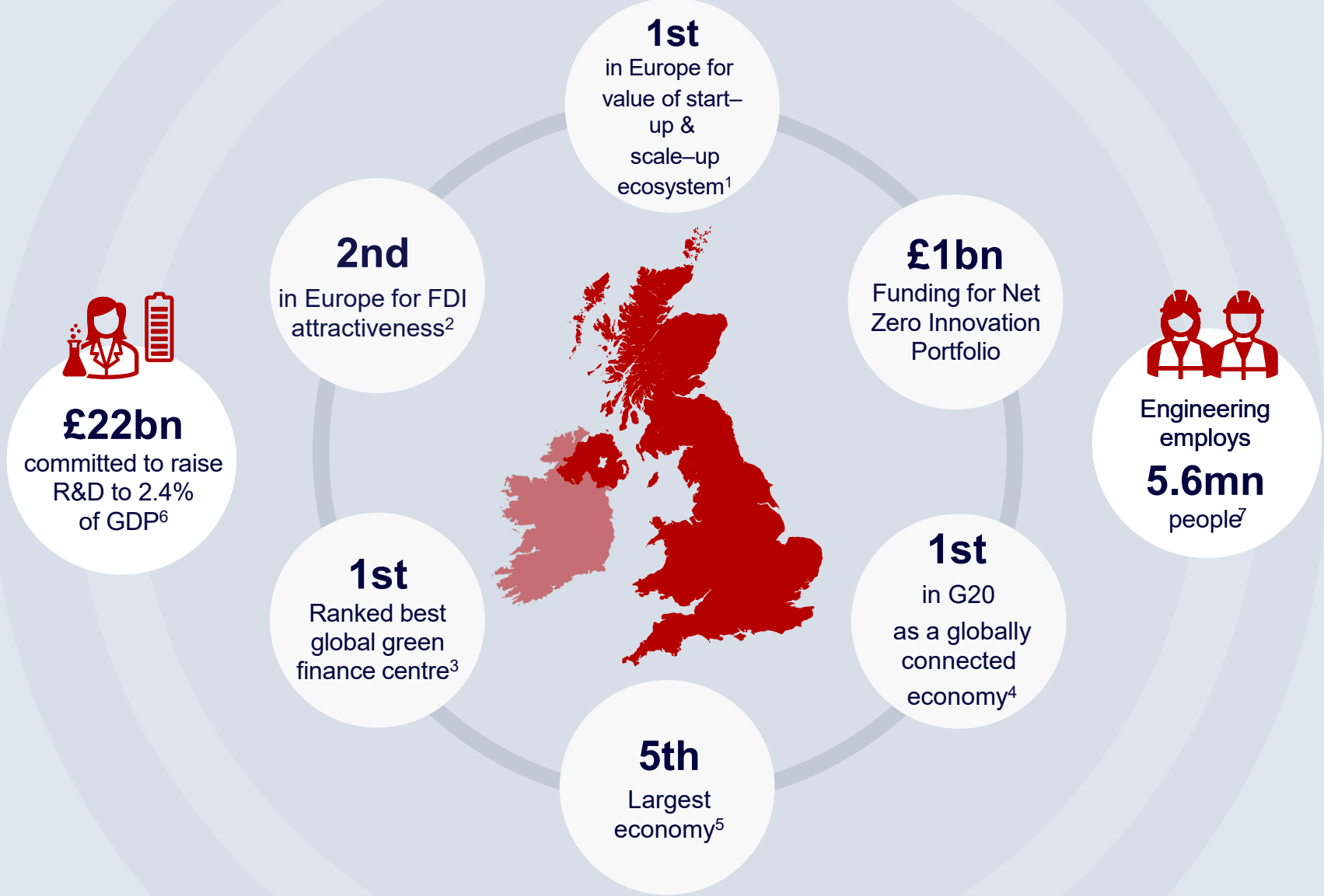
**We're providing £100's of millions in support for businesses and consumers to bring more heat pump manufacturing to the UK. The UK will soon be one of the largest markets in Europe for heat pumps, boosting our energy security and helping us reach net zero.**

**Rt Hon Grant Shapps MP – Secretary of State for Department for Energy Security and Net Zero**



- The UK Government is committed to ambitious action to decarbonise the way homes and businesses are heated.
- Heat pumps have a key role to play in decarbonising heating across the UK – irrespective of the role of hydrogen or other heating technologies – that is why we aim to increase the number of heat pump installations from 55,000 a year in 2021 to 600,000 a year by 2028.
- By the end of the decade, the UK will be one of the largest markets in Europe for heat pumps.
- To attract investment, the UK Government is delivering a package of policies, including targeted regulation, a new market-based mechanism, and public investment through programmes such as the Boiler Upgrade Scheme.
- Heating appliance manufacturers from across the globe are investing in the UK, owing to the supportive policy environment, tax incentives and availability of skilled labour.
- To further help heat pump manufacturers expand their businesses in the UK, and to encourage the transition from fossil fuel boiler manufacturing to heat pump manufacturing, we are also aiming to create new investment opportunities through programmes like our Heat Pump Investment Accelerator Competition.

# The UK has one of the world's most attractive business and investment environments



- Open, liberal economy
- Stable regulatory regime with independent legal system
- Globally competitive and transparent tax regime
- Generous R&D and patent tax relief
- The UK-EU Trade and Cooperation Agreement allows zero tariff market access with the EU
- Flexible labour market
- World class professional services sector supporting businesses with insurance and finance
- Already significant exporter of heat pumps and component parts

References: <sup>1</sup>Dealroom, <sup>2</sup>EY Attractiveness Survey June 2022 Attractiveness, <sup>3</sup>Z/Yen Global Green Finance Index 2022 (GGFI 10), <sup>4</sup>DHL Global Connectedness Index 2021, <sup>5</sup>Official statistics converted at market exchange rates as a source; <sup>6</sup>UK Innovation Strategy (2021); <sup>7</sup>Workforce trends (2022)

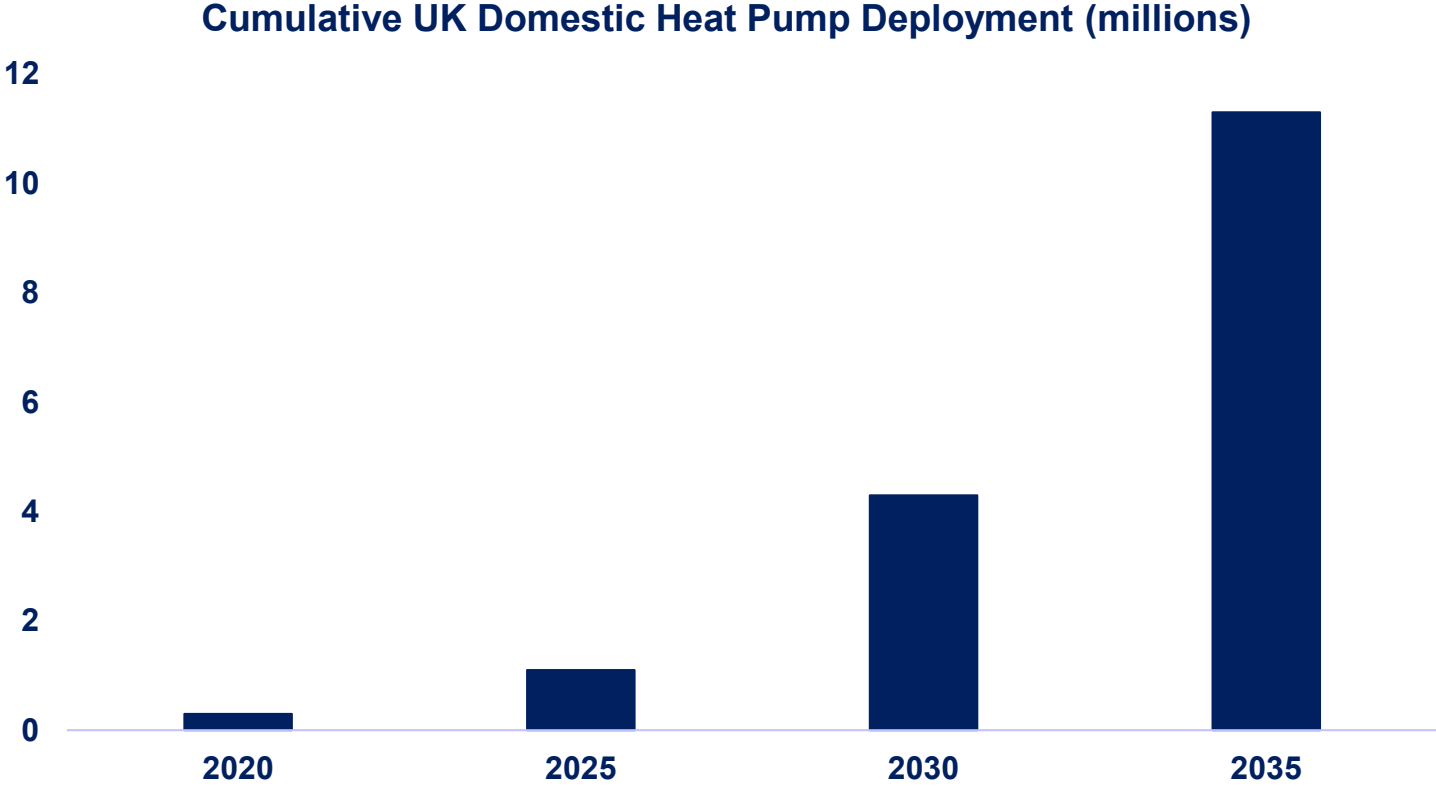
# Heat pumps vital to Net Zero

Heat pumps are a widely suitable and cost-effective solution for decarbonising the UK's buildings and are vital to delivering Net Zero.



- Heating is responsible for **over a third** of UK carbon emissions. Reducing our carbon emissions to Net Zero by 2050 means we must decarbonise the heating of over 30 million homes and businesses across the UK in a little over 25 years.
- In addition, **around half** of our natural gas demand is from heating, so decarbonising our heating is also an energy security priority.
- Regardless of the role of other technologies, we expect **at least four million** heat pumps to be installed by the end of the decade.
- A heat pump can reduce carbon emissions by **up to 70 per cent** compared with a gas boiler, and as we decarbonise the supply of electricity this will only increase.
- Evidence shows that the majority of UK homes and businesses are suitable for a heat pump. This includes analysis which estimates that **90 per cent** of British homes have sufficient insulation and electrical capacity for a heat pump.
- Heat pumps are **cost effective** when compared to other low carbon heating technologies; investment by industry in more efficient heat pumps, means they are now typically more than three times as efficient as a gas boiler.
- **Hundreds of thousands** of heat pumps have already been installed in the UK. They are proven to work, even in the variable British climate; delivering warmth to satisfied customers up and down the country, even at sub-zero temperatures.

# UK projected demand for heat pumps over next decade



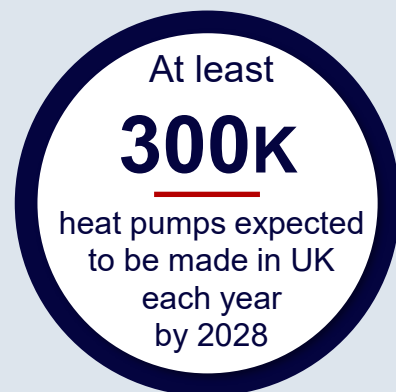
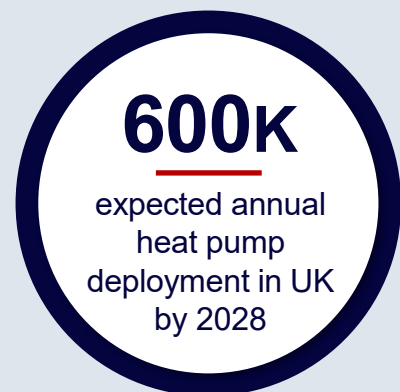
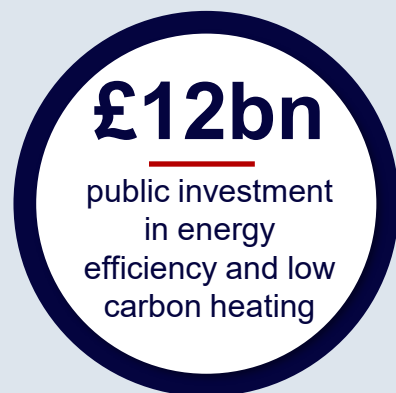
Illustrative Heat Pump Deployment (High Electrification Scenario) – Net Zero Strategy

The UK’s rate of heat pump installation is expected to increase rapidly over the next decade.

- **A growing market:** The market has averaged year-on-year growth of 25 per cent between 2016 and 2021 (including 50 per cent in 2021), with developing opportunities in new buildings, as well as in the retrofit market.
- **Supply chain and infrastructure:** Investment in heat pump manufacturing supply chains and enabling infrastructure will need to grow to supply increasing demand and provide UK with the energy security it needs.

# Why invest in the UK heat pump market?

## A sector with ambitious targets and major opportunities for growth



- **Long term vision** with an aim to grow the market to 600,000 heat pump installations each year by 2028 and up to 1.9 million a year by 2035, underpinned by ambitious policies.
- **Regulations** to phase out fossil fuel heating in homes and businesses over next decade, starting with new buildings in 2025; with many housing developers already switching to heat pumps.
- A **Clean Heat Market Mechanism** to be introduced in 2024, giving investors confidence in sustained growth of the UK heat pump market.
- Over £12 billion in **public investment** through grant programmes to incentivise the public and businesses to decarbonise buildings, including the Boiler Upgrade Scheme, Public Sector Decarbonisation Scheme and Social Housing Decarbonisation Fund.
- **Enabling environment** with government support to unlock investment in renewable electricity generation, electricity grid infrastructure, and green financing solutions.
- **Innovation funding** available to develop heat pump solutions for the UK housing stock, that are simple to install, efficient and affordable.
- **Grants, financing and expert support available to businesses** to help them grow and invest in the UK heat pump supply chain, which is already home to some of the world's biggest heating equipment manufacturers, as well as cutting edge innovators bringing the latest technology to market.
- Strong, proven and growing **export opportunity** with £100 million of heat pumps and components already exported by UK companies.

# Supportive policy and regulatory environment

## World-leading policy framework

- **Regulation** – Introducing a Future Homes Standard for new build in 2025. Consulting on ending the installation of new fossil fuel heating for homes and non-domestic buildings off the gas grid, starting in the mid 2020s. Aiming to phase out the installation of new and replacement natural gas boilers by 2035 at the latest, and will further consider the Net Zero Review’s recommendation in relation to this.
- **Clean Heat Market Mechanism** – Launching a market-based mechanism for heat pumps from 2024. A clear market-wide standard for low-carbon appliances as a proportion of sales to provide industry with the policy confidence to invest in supply chains, partnerships and innovation to scale the consumer market.
- **Public Investment** – Providing £6.6 billion from 2021 to 2025 in public funding to decarbonise our homes and businesses, such as the Social Housing Decarbonisation Fund, Public Sector Decarbonisation Scheme and Boiler Upgrade Scheme. Further commitment of £6 billion from 2025 to 2028, which includes an extension of the Boiler Upgrade Scheme until at least 2028.

## Building infrastructure and supply chains

- **Heat Pump Investment Accelerator Competition** – Flagship initiative with up to £30 million available to support private sector investment in heat pump and component manufacturing infrastructure across the UK.
- **Freeports [\[Link\]](#)** – Providing tax relief, customs support, business rates retention, planning regeneration, innovation and trade and investment support across 12 areas of the UK.
- **Investment Zones [\[Link\]](#)** – Creating 12 high-potential knowledge-intensive growth clusters across the UK, including 4 across Scotland, Wales and Northern Ireland. Each English Investment Zone will have access to interventions worth £80 million over 5 years, including enhanced rates of Capital Allowance, Structures and Buildings Allowance, and relief from Stamp Duty Land Tax, Business Rates and Employer National Insurance Contributions. Alongside this, they will have access to flexible grant funding to support skills, provide specialist business support and improve local infrastructure, dependent on local requirements.



# Incentives to innovate and invest

## Financing and de-risking investments

- **Business Loans** – The British Business Bank and UK Infrastructure Bank (UKIB) can offer loans to de-risk investments. UKIB can invest in the manufacturing of heat pumps, but will also invest in innovative business models which accelerate the installation of heat pumps across the UK.
- **Capital Allowance [\[Link\]](#)** – Allows businesses to deduct some or all of the value of eligible plant and machinery from profits before paying tax. From April 2023 to March 2026, this includes an annual investment allowance, where businesses can claim up to £1 million on certain plant and machinery, as well as a 100% first year allowance, allowing businesses to claim the full amount for certain plant and machinery in the year that it was bought.
- **UK Export Finance Development Guarantee [\[Link\]](#)** – Delivering enhanced support for supply chains by facilitating the growth of existing and new exporters.

## Innovation support

- **Innovation Grants** – UK Government runs [grant funding competitions \[\\[Link\\]\]\(#\)](#) and offers other funding, including [Smart Grants \[\\[Link\\]\]\(#\)](#) and [Small Business Research Initiative \[\\[Link\\]\]\(#\)](#). This includes investing up to £60 million in heat pump innovation through the new Heat Pump Ready programme.
- **R&D Tax Relief** – The UK has a generous and internationally competitive R&D credit system, including the [R&D expenditure credit \[\\[Link\\]\]\(#\)](#), [R&D tax relief \[\\[Link\\]\]\(#\)](#) and the [R&D Allowance \[\\[Link\\]\]\(#\)](#) (RDA).
- **Patent Box** – The [Patent Box \[\\[Link\\]\]\(#\)](#) let companies apply for reduced rate of corporation tax of just 10% on profits earned from patented inventions and other intellectual property.



# Building the capacity and capability of the UK workforce

- **Delivering world leading standards** for heat pump installations through the industry led Microgeneration Certification Scheme across the UK.
- **£5 million Heat Training Grant** to support low carbon heating training, expected to support around 10,000 training opportunities in England. Starting in April 2023 and continuing until March 2025 to help deliver accredited skills training and support to installers across the energy efficiency and heat pump sectors.
- In addition, the UK government has already committed £15 million since 2020 through the **Home Decarbonisation Skills Training Fund**, supporting over 16,000 training opportunities in energy efficiency, retrofit and low carbon heating sectors across England. In Scotland, £1.49 million of funding has been made available through the **National Transition Training Fund**, to support over 3,350 participants to access courses for heat pump, energy efficiency and retrofit construction skills.
- **Supporting new installers** enter the industry via the new [Low Carbon Heating Technician Apprenticeship \[Link\]](#), which offers a direct route into the small-scale renewables industry. With apprentices already being able learn to install heat pumps as part of the [Plumbing & Domestic Heating Technician \[Link\]](#) apprenticeship.
- In England, the Department for Education is investing an additional **£3.8 billion in skills** by 2024-25. This includes funding to support green skills, including apprenticeships, T levels and Skills Bootcamps.
- Supporting the **Institutes of Technology** across England with £120 million for institutes specialising in delivering high technical education and developing green skills.
- Reforming the skills system through **Local Skills Improvement Plans** in England and introducing a **Lifetime Skills Guarantee** to help workers gain the skills they need to transition to the green economy, including through targeted support for retraining.
- The **Green Jobs Delivery Group** has been established as the central forum through which government and industry are working together to accelerate the supply of a skilled workforce for our low carbon sectors.

## Investing in skills and training



# Manufacturing supply chain investment



manufacturing investment expected in UK by 2028.

The expected rapid growth of the UK heat pump market offers a significant opportunity to companies currently supplying the fossil fuel boiler sector, as well as established heat pump manufacturers and new entrants to the market. Investing now will help them establish a strong market presence, diversify their business and localise their manufacturing production to serve growing local supply demand in the UK and for export to other markets.

## Investment opportunities:

- Heat pump manufacturing and assembly.
- Thermal battery and hot water cylinders.
- Compressors.
- Pumps and valves.
- Smart control systems.

See more on [high-potential opportunities for manufacturing investment](#).

## Examples of projects:

### Mitsubishi Electric

Mitsubishi have recently invested a further £15.3 million in its Livingston manufacturing facility, with Scottish Enterprise support, to significantly increase its productivity, efficiency and research and development (R&D) capabilities.

[Details here.](#)

### Ideal Heating

Ideal Heating has made a £16 million investment to support the expansion of production and storage capacity at its Hull factory, as it expands its business into low carbon heating.

[Details here.](#)

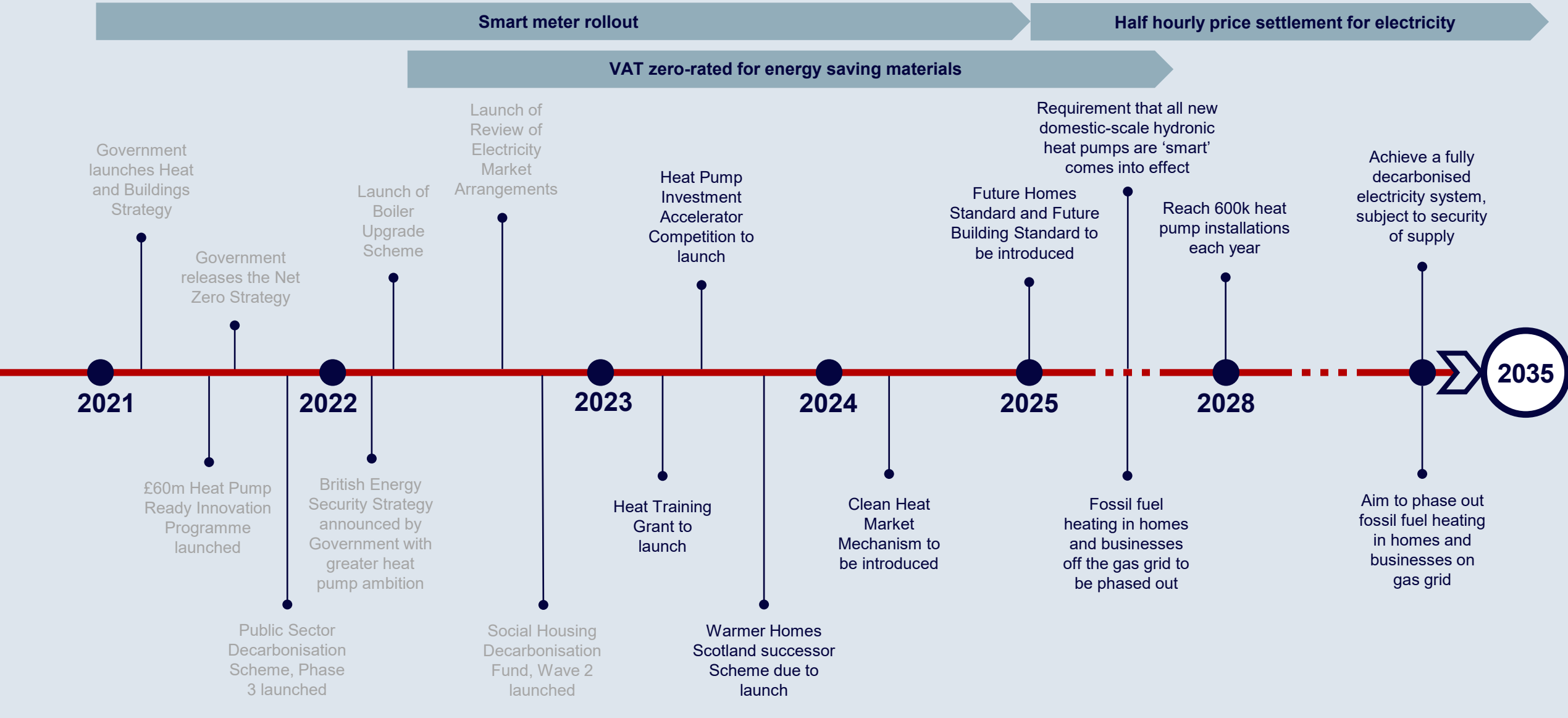
### Octopus Energy

Invested £10 million in the UK's first heat pump R&D and training centre in Slough, and subsequently invested in Northern Irish heat pump manufacturer Renewable Energy Devices, to expand current factory and scale heat pump production capacity to over 12,000 heat pumps a year; bringing 100 new green jobs to Northern Ireland.

[Details here.](#)

# Our 2035 delivery plan

Timings are indicative and subject to change



# Further ways we help you invest and develop in the UK

The UK's commitment to support global investment is unparalleled

## **The Department for Business and Trade (DBT)**

**DBT supports businesses** to invest, grow and export, creating jobs and opportunities across the country.

## **Office for Investment (OFI)**

Ofi is a joint DBT and No.10 team that provides a single front door to Government for high-value and high-impact investors, facilitating with access and insights through a concierge offer. The Ofi works across departments to drive increased investment in line with the Government's Net Zero agenda.

## **UK Export Finance (UKEF)**

The UK's export credit agency, has enhanced its support to attract investment into supply chains and building export capability.

## **UK infrastructure Bank (UKIB)**

The UKIB can invest across the capital structure (senior debt, mezzanine, first loss, debt guarantees and equity) to help crowd private finance into net zero infrastructure.

## **Support moving a tech business**

The Global Entrepreneur Programme (GEP) helps high-growth overseas companies relocate to the UK.

## **Economic development agencies**

There are a number of organisations with significant experience in delivering public sector investment packages. For example, Scottish National Investment Bank is a mission-led development bank that provides patient capital to build a stronger, fairer, more sustainable Scotland.

## **Helpful guides**

Guidance on expanding to the UK, including visas and migration; tax and incentives; regulatory and business planning; staff recruitment, retention and training; and immigration.

## **Links to key organisations**

In addition to centres of excellence and industry clusters, we will facilitate introductions to universities, Local Enterprise Partnerships (LEPS) and Enterprise Zones.

## **Find a UK specialist**

The UK Investment Support Directory allows you to find companies with skills and experience in helping overseas businesses set up or expand in the UK.

Visit [great.gov.uk](https://www.great.gov.uk)

# Appendix – Notes and Definitions

Investment needs are defined as the total sum of capital contributions required to deliver the necessary projects to achieve the current deployment pathway assumed in the Net Zero Growth Plan.

## Methodology used to estimate the investment need:

- Domestic Heat Pumps: Illustrative unit costs for heat pumps are split by retrofit and new builds (including Capital Expenditure reduction over time) and then are multiplied by estimated heat pump deployment projections.
- Non-Domestic Heat Pumps: The policies included have been modelled using the Non-Domestic Buildings Model, which assumes a deployment rate in line with the natural replacement cycle and mimics the above methodology.

## Data Caveats:

- The investment need uses a 2021 price base year, represents all capital upfront costs needed for heat pumps including installation and ancillary work (i.e. no Operating Expenditure costs are provided in this analysis), with financing excluded, and prices are in real terms.
- Heat pump deployment is based on 'high electrification' delivery pathway, where it is assumed that heat is electrified, and hydrogen is not used for heating buildings. In any future scenario, irrespective of the role of hydrogen in heating buildings, we would expect heat pumps to play a significant role.



### Disclaimer

**The Department for Energy Security and Net Zero** is the department for delivering security of energy supply, ensuring properly functioning markets, greater energy efficiency and seizing the opportunities of net zero to lead the world in new green industries. **The Department for Business and Trade** is the department for economic growth. We support businesses to invest, grow and export, creating jobs and opportunities across the country.

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