

## Written evidence submitted by the Association for Decentralised Energy (IND0040)

### About the Association for Decentralised Energy

The Association for Decentralised Energy (ADE) is the UK's leading trade association for decentralised energy, advocating for its two missions: Decarbonising British Heat and Empowering Energy Demand. The ADE represents more than 160 organisations from across the energy sector, working across a broad range of technologies.

Empowering Energy Demand strives to make sure Great Britain embraces the value of a decarbonised, demand-led system, creating a future where households, businesses and industry are properly rewarded. Through Decarbonising British Heat, the ADE is transforming how British homes and business are heated, for a future where heat is secure, clean and drives economic growth.

**Summary:** The UK Government has set enormously ambitious targets for renewable capacity and network expansion, but we believe that these estimates overstate the actual supply chain demands. By refocusing on strategic investments in domestic supply chains and smart, efficient use of existing infrastructure, such as enhanced demand-side flexibility we can significantly reduce both the supply chain constraints and our reliance on international suppliers. This more measured approach strengthens energy security and drives local economic growth.

#### 1. How can UK plc capture its fair share of the economic potential of emerging or less developed energy technologies?

Through empowering energy demand and decarbonising British heat, UK plc can see the true economic potential of emerging energy technologies, as well as the impact they can have on jobs, growth, and net zero.

A key emerging technology that will drive economic growth is heat networks, where the market penetration of heat networks is expected to grow from 2% to 20% by 2050 according to the Climate Change Committee (CCC)<sup>1</sup>. The ADE suggests this could generate up to £100 billion of private investment, alongside 81,000 jobs by 2050<sup>2</sup>. The country is already witnessing the potential of the heat network sector – the Green Heat Network Fund has created an environment that generates at least £3 of private investment for every £1 of public funding. Heat networks as a technology have the potential to be a key driver in UK plc's economic potential, and this potential must be recognised for their expansion to become a priority for international investors. Further, to ensure UK workers feel the benefit of this expansion, Government must address the skills gap within the heat network sector to speed up their deployment, improve the quality of design, and reduce delivery costs. Whilst substantial parts of heat networks supply chains are currently international due to the more mature heat network markets in other parts of Europe, reshoring should be an ambition of the UK Government. Critical supply chain areas such as pipe manufacture, the manufacture of heat network-specific components (for example, Heat Interface Units) and large-scale heat pumps will only be achieved when there is significant confidence in heat network growth projections. The introduction of customer regulation and heat network zoning will support this. However, supply chain companies will not invest if they continue to consider that persistent low-cost fossil heating will impair the scale of heat networks in the UK.

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<sup>1</sup> <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

<sup>2</sup> <https://www.ippr.org/articles/piping-hot>

## **2. What more can the Government do to encourage greater domestic supply chain investment in the energy industry by 2035, including through the Contracts for Difference scheme?**

To achieve greater investment in the UK supply chain, the Government must first prioritise the rapid scaling of heat networks. Currently providing just 2% of UK heat demand, heat networks have the potential to meet 20% by 2050<sup>3</sup>, catalysing up to £100 billion in private investment<sup>4</sup>. This makes heat networks the largest investment opportunity in Europe. Crucially, 60% of jobs in this sector are local and cannot be offshored, making heat networks a uniquely local option for British supply chains. This will create a manufacturing base capable of creating export opportunities of at least £1bn. By legislating the 2035 gas boiler phase-out and delivering Heat Network Zoning, the Government can provide the long-term certainty needed to attract investment. By leveraging

Stabilising policy and fiscal signals are essential to attract investment. Investors require clarity to commit capital. The Government must commit to the gas boiler phase-out, which will send a clear signal to British investors to invest in the decarbonised heating supply chain now. Reforming electricity levies to rebalance costs from electricity to gas would further incentivise this investment. Aligning carbon pricing with net zero, including through the UK Carbon Border Adjustment Mechanism (CBAM), would protect domestic industries like steel from unfair competition while driving decarbonisation.

Investing in skills to close the green labour gap is also vital. 725,000 new jobs could be created in the UK's low carbon supply chain by 2030<sup>5</sup>. Expanding Government involvement to coordinate sector-specific training, such as for heating installers and grid engineers, would address this growth. Offering grants for apprentices in priority trades would also incentivise job creation, while embedding heat network modules in T-Levels and apprenticeships would future-proof the supply chain.

The UK's future competitiveness – and hence the strength of our domestic supply chains – hinges on slashing energy costs. With electricity prices 39% and 53% higher than those in Germany and France respectively<sup>6</sup>, data centres and other critical investments are avoiding investment in the UK. High energy prices (among the highest in Europe) undermine the UK's economic appeal, meaning we cannot harness upcoming global investment. Reducing electricity costs is therefore important. Smarter demand management is a key way of doing this. Carbon Trust estimates additional flexibility will save an estimated £16 billion annually in system costs by 2050<sup>7</sup>. By investing in flexibility, the Government can both deliver a stronger grid and greater opportunities for domestic investment.

The UK's energy supply chain challenges are solvable with strategic state intervention. By anchoring investment in heat networks, reshoring critical manufacturing, modernising grid planning, stabilising policy signals, and investing in skills, the Government can encourage investment in a strong domestic supply chain.

## **3. Does the UK have the supply chain capacity to deliver the required energy infrastructure by 2035, including an expanded electricity network?**

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<sup>3</sup> [gov.uk/government/consultations/proposals-for-heat-network-zoning-2023/heat-network-zoning-consultation-summary](https://gov.uk/government/consultations/proposals-for-heat-network-zoning-2023/heat-network-zoning-consultation-summary)

<sup>4</sup> [heatnic.uk/case-studies/1bn-low-carbon-heating-infrastructure-project-unveiled-in-westminster/](https://heatnic.uk/case-studies/1bn-low-carbon-heating-infrastructure-project-unveiled-in-westminster/)

<sup>5</sup> [theccc.org.uk/wp-content/uploads/2023/05/CCC-A-Net-Zero-Workforce-Web.pdf](https://theccc.org.uk/wp-content/uploads/2023/05/CCC-A-Net-Zero-Workforce-Web.pdf)

<sup>6</sup> [gov.uk/government/statistical-data-sets/international-industrial-energy-prices](https://gov.uk/government/statistical-data-sets/international-industrial-energy-prices)

<sup>7</sup> [carbontrust.com/our-work-and-impact/guides-reports-and-tools/flexibility-in-great-britain](https://carbontrust.com/our-work-and-impact/guides-reports-and-tools/flexibility-in-great-britain)

There will be less stress on supply chain capacity if the Government prioritises using the infrastructure that we currently have in a more strategic manner. What is required to meet 2035 is hugely ambitious, and it unclear with the present direction of travel whether we can deliver this infrastructure globally. Transformers prices have risen by 80% since 2020<sup>8</sup> and as of May 2023 there were 1,100 projects in the grid connection que, representing over £200bn in investment, with 40% having a wait time of at least a year. However, there are clear Government actions to deliver further capacity in our energy system and ease the burden on network reinforcement.

Flexibility is the solution that allows networks to spread out investment overtime, as well as building the workforce and supply chains in a sustainable way. Over-investing in the network without flexibility in mind risks exacerbating issues currently faced across the energy system, such as heightened costs to consumers and extinguishing the signal for consumer-led flexibility. Capitalising on the benefits of consumer-led flexibility on the distribution network can help to reduce supply chain pressures associated to a high volume of network reinforcement being required over a 'pinch point' by helping to manage demand on the network demand. To deliver this stronger supply chain the National Energy System Operator (NESO) will need to be timely and transparent with strategic energy planning such as the Regional Energy Strategic Plan (RESP), Central Strategic Network Plan (CSNP), and Strategic Spatial Energy Plan (SSEP), to be able to manage expectations for what will be needed from the supply chain for the network in the near future. A more flexible energy system will reduce pressured on supply chains and allow the electricity network to expand in a more sustainable way.

To protect the capacity of the supply chain and reinforce this sustainable trajectory, technologies such as heat networks and combined heat and power (CHP) will be instrumental in increasing the efficiency of energy supply. Through generating heat and power at the same time through CHP, 30% of total energy can be saved compared to sites that deliver heat and power separately. Such technology is critical for bringing industry with us on the transition, specifically for sites outside of the clusters, which otherwise risk being left behind. Not only can this drastically increase whole system efficiency, but drives competitiveness amongst businesses that engage, in turn driving economic growth and enabling industry to operate effectively as part of this transition. Supporting industrial decarbonisation outside of the clusters through technologies such as CHP could protect up to 770,000 jobs, and gives industry the confidence it needs to invest.

Supply chain capacity will also be heavily dependent on the decarbonisation of industry and it's roles over the next few crucial years. Government needs to be clearer in its strategy regarding existing industrial assets and their role in the energy transition. Utilising technologies that enable industrial flexibility will be vital in ensuring industry can continue to thrive economically, whilst being supported on the path to net zero. The Government should review existing market rules to improve industrial and commercial companies' participation in flexibility markets and further develop its policy for industrial sites outside of the clusters, to support earlier investment in low-carbon technologies. Protecting these vital heavy industrial sectors will in turn protect the huge parts of the supply chain that depend on these sites.

Strategic planning, alongside clear Government guidance will be important to give the infrastructure sector confidence to invest now. The ADE urges the Government to send stronger flexibility signals to industry through the implementation of zonal pricing and the Review of Electricity Market Arrangements (REMA). It is important to match this investment in industrial decarbonisation by

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<sup>8</sup> [woodmac.com/news/opinion/supply-shortages-and-an-inflexible-market-give-rise-to-high-power-transformer-lead-times/](https://www.woodmac.com/news/opinion/supply-shortages-and-an-inflexible-market-give-rise-to-high-power-transformer-lead-times/)

delivering increased flexibility and ensuring that supply side assets are used as productively as possible. This will increase efficiency of the system, and this in turn will facilitate the anticipated growth UK plc expects. The price for resolving traffic jams on the grid could reach £3 billion a year by the end of the decade<sup>9</sup>, which is more than 20 times what they were 20 years earlier. Zonal pricing will provide better signals for the utilisation of low-carbon, supply side assets, and could generate up to £24 billion of consumer benefits<sup>10</sup>. Whilst there is mixed support from ADE members on the matter, the ADE believes a zonal market is the best route to protecting consumers and reaching a cost-efficient net zero power system.

Whilst there are clear plans for power network infrastructure leading up to 2035 (which will encourage further investment), we must stress electricity networks are not the only types of networks that are expanding, there are also heat networks, through the development of heat networks that can harness local heat sources and heat buildings more efficiently than individual heat pumps, heat networks can greatly reduce the infrastructure that will be needed in the transition to decarbonised heat.

The 2035 infrastructure goals are extremely ambitious but success hinges on leveraging flexibility, CHP and heat decarbonisation to reduce peak demand. Coupling this with accelerating NESO's strategic plans to provide supply chain certainty and targeted investment in workforce. Without these measures, supply chain bottlenecks and delays could derail progress. However, with reforms like the Clean Power 2030 Action Plan and SSEP, the UK can align capacity with ambition.

#### **4. To what extent would growing the domestic supply chain bolster UK energy security?**

Material shortages and stress on workforces present significant challenges to the expansion of the domestic supply chain. As global demand for critical materials, such as metals for renewable energy technologies and batteries, continues to rise, supply constraints are becoming increasingly common. This not only drives up costs but also risks delaying vital infrastructure projects needed for energy transition. Additionally, the workforce required to build and maintain this expanded supply chain is already stretched thin, exacerbating pressures on productivity and increasing labour costs. Our excessive reliance on international supply chains further amplifies these issues, as disruptions—whether due to geopolitical tensions, pandemics, or natural disasters—can lead to severe supply shortages and operational delays.

Growth of the domestic supply chain within the UK will strengthen energy security, through reducing resilience on international markets and mitigating supply disruptions. However, this alone will not protect us against volatile markets and vast variations in the international energy market. To counter these vulnerabilities, the UK must invest in the smartest energy system today. By doing so, we can reduce our dependency on volatile international markets, enhance energy security, and build a more resilient and sustainable energy future. The key to this is demand-side flexibility, so that we do not waste the energy supply we currently have. Without this, our energy system will continue to face issues such as grid congestion and intermittency issues, even with an expanded domestic supply chain.

Consumer-led flexibility works hand in hand with reducing pressures on the UK's domestic supply chain. Through increased utilisation of flexible technologies such as electric vehicles (EVs), which, if used a flexible way could reduce peak demand on the electricity system by 65% in 2030<sup>11</sup>, reducing

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<sup>9</sup> Ofgem, 2023: Assessment of locational wholesale electricity market design options in GB

<sup>10</sup> LCP Delta 2023: System Benefits from Efficient Locational Signals A study on moving the electricity market to a locational pricing model for the Department of Energy Security and Net Zero

<sup>11</sup> <https://www.futureenergyscenarios.com/2023-FES/>

pressure on the grid. This means that there is less need for over-investment in expanded grid capacity, and less reliance on costly reinforcements. Over-investment in the UK’s infrastructure risks material shortages, stress on our overexerted workforce and pressures of rising costs. Therefore, we must see bold action from Government, Ofgem, and NESO to ensure the UK can meet the requirement of 4 – 5 times the current levels of consumer-led flexibility<sup>12</sup>. A focus on utilising our current technology and supply-side capacity, could generate savings of up to £5 billion a year in system cost savings up to 2050<sup>13</sup>, bolstering the nation's energy security, and freeing up funds to be reinvested into domestic supply chain upscaling.

Growing the domestic supply chain will significantly bolster UK energy security by reducing import dependency and enhancing economic resilience. However, its full potential can only be unlocked when combined with complementary measures—such as demand-side flexibility, grid upgrades, and robust policy support. This integrated strategy is the only way to deliver the UK’s long-term decarbonisation and net-zero ambitions.

**5. What are the key concerns with respect to the availability of raw materials in the supply chain and how might those be addressed?**

The ADE does not have an opinion on this.

*February 2025*

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<sup>12</sup> <https://www.neso.energy/document/346651/download>

<sup>13</sup> <https://www.carbontrust.com/our-work-and-impact/guides-reports-and-tools/flexibility-in-great-britain>