
ADE | EMPOWERING ENERGY DEMAND
FINAL RESPONSE
INVEST 2035: THE UK'S MODERN INDUSTRIAL STRATEGY
22 NOVEMBER 2024

Context

On behalf of Empowering Energy Demand, we welcome the opportunity to respond to the Department for Business and Trade's consultation on the UK's Modern Industrial Strategy. We have also responded to the consultation on behalf of our sister mission, Decarbonising British Heat.

Our mission is to embrace the value of a decarbonised, demand-led energy system, creating a future where households, businesses and industry are properly rewarded. The current electricity system is creaking under the demands of a rapidly changing system. We must harness the millions of EVs, heat pumps and the immense industrial demand we have right now to lower bills and keep our electricity system operable. Instead, we're fighting against them. Even more than that, industrial energy is decarbonising with long-term consequences for our energy system - creating new infrastructure and unlocking even greater sources of flexibility. The Government, Ofgem, the CCC and others all recognise that households, businesses and industry should play an active role in a decarbonised electricity system. Now is the time to make this a reality.

Consultation Questions

Q1. How should the UK government identify the most important subsectors for delivering our objectives?

We see a lot of positive elements to the Industrial Strategy, most overarchingly, we're pleased to see that Net Zero underpins the entire strategy across all sectors and identified barriers to growth. The framework seems to be well thought out: the time span of 10 years feels attainable and sensible; and the 8 chosen "high growth" sectors seem well thought out. Although, it's to be seen how businesses that span more than one sector will be categorised and treated. ADE members could easily fall into one or more sectors. Indeed, it is important to consider the divergent energy needs of different sectors and even sub-sectors therein. Government is acutely aware that one decarbonisation solution will not work for all industries and therefore the sectoral plans that stem from this consultation must be reflective of that.

We must identify sectors that best cohere to the five missions of this Government, which is why we welcome the inclusion of Clean Energy Technologies in the strategy. Likewise, we ought to ensure that energy intensive sectors have a viable and economic route to decarbonisation, as discussed below in relation to industrial electrification.

More particularly, the ADE is supportive of the inclusion of investment in data-specialised businesses, under the "Creating a Pro-Business Environment" header. We were pleased to see all of major findings from the [Summary of Responses from the 2023 Call for Evidence on Industrial Electrification](#) included

under “Energy and infrastructure” and Government reiterated its commitment to unlocking barriers to industrial electrification. Similar to the benefits of the Regional Energy Strategic Plans (RESPs), the Industrial Strategy is rightly focused regions, via a “place-based approach to policy.” However, the ADE will always be concerned about any policy with a hyper-focus on clusters and cities.

Although not a single sector, it is crucial that a focus on smart systems spans all subsectors within Clean Energy Technologies. The Government’s work through the Smart Secure Energy Systems, legislated for in the Energy Act 2023, makes clear that we expect our energy devices going forward to be smart as standard, capable of supporting a decarbonised electricity grid. Therefore, all regulatory barriers to this aim must be removed, including cross-departmental barriers arising from the Measuring Instrument Regulations 2016. We have included some of the key objectives needed to unlock demand side flexibility at scale in our responses to Q19 and Q20.

Q2. How should the UK government account for emerging sectors and technologies for which conventional data sources are less appropriate?

Q3. How should the UK government incorporate foundational sectors and value chains into this analysis?

Q4. What are the most important subsectors and technologies that the UK government should focus on and why?

Combined Heat & Power (CHPs) are an important technology that should be recognised within the Clean Energy sector. Heavy industrial sites outside of the 6 designated clusters rely on CHPs to use scarce resources as efficiently as possible and have the long-term capability of switching to carbon-neutral fuel (such as biogas/biomethane). CHPs are helping difficult to decarbonise industries make the transition to Net Zero and also provide system resilience and flexibility. The ADE recommends Government consider the ways in which sectors energise themselves (CHPs or otherwise), and that those generation and heat sources be adequately incentivised and supported to the extent they further our Net Zero goals. See also our response to Q16.

Q5. What are the UK’s strengths and capabilities in these sub sectors?

For the Government’s objective to achieve Clean Power by 2030 and growth of the UK economy, sectors that are able to participate in energy flexibility are of significant importance. With a [major projected expansion in \(onshore and offshore\) wind and solar](#), and an extensive connections queue, utilising flexible industry will be vital to maintain grid stability and to limit both constraint and curtailment costs past down to consumers. Taking advantage of clean power will diversify our generation and demand mix and pattern, which could facilitate the ability for Great Britain to become a net exporter to neighbouring markets, using flexibility to provide grid efficiency.

Additionally, building off our response to Q4, CHPs also support grid stability, a site's security of supply, provides support during dunkelflaute periods and CHPs' ability to be located close to demand reduces network re-enforcement costs.

Q6. What are the key enablers and barriers to growth in these sub sectors and how could the UK government address them?

The treatment of a site's CHP emissions in terms of Scope 1 and 2 rather than 4 is a barrier, i.e. sites believe they are reducing gas consumption of their site by having a CHP, but from a regulatory perspective it is simply being shifted to a less efficient CCGT. Another barrier is the Government's withdrawal of grant support for CHP schemes which will save money for the end user and CHPs could be producing lower carbon power than the electricity on the local grid. See also our answer to Q16.

Q7. What are the most significant barriers to investment? Do they vary across the growth-driving sectors? What evidence can you share to illustrate this?

As laid out in the National Energy System Operator's (NESO) recent [Advice on Achieving Clean Power by 2030](#), the connections queue is currently oversubscribed, and the delays in securing a connection to the grid is a major barrier to investment across all sectors.

The ADE supports the work being done to reform the connections queue and build out/reinforce the grid at the transmission level. However, even more growth can be unlocked if the same is done at the distribution level, and at speed. More needs to be done to support Distribution Network Operators (DNOs) and hold them to account, especially with the guaranteed increase in demand from industrial electrification. See also our answer to Q20.

Q8. Where you identified barriers in response to Question 7 which relate to people and skills (including issues such as delivery of employment support, careers, and skills provision), what UK government policy solutions could best address these?

Clear delivery plans are needed for heat decarbonisation at the domestic and non-domestic level, for more detail see our Decarbonising British Heat response.

Q9. What more could be done to achieve a step change in employer investment in training in the growth-driving sectors?

Q10. Where you identified barriers in response to Question 7 which relate to RDI and technology adoption and diffusion, what UK government policy solutions could best address these?

Q11. What are the barriers to R&D commercialisation that the UK government should be considering?

Q12. How can the UK government best use data to support the delivery of the Industrial Strategy?

Q13. What challenges or barriers to sharing or accessing data could the UK government remove to help improve business operations and decision making?

Q14. Where you identified barriers in response to Question 7 which relate to planning, infrastructure, and transport, what UK government policy solutions could best address these in addition to existing reforms? How can this best support regional growth?

The ADE encourages Government to utilise Regional Energy Strategic Plans (RESPs) and consider linking them with the Industrial Strategy.

Q15. How can investment into infrastructure support the Industrial Strategy? What can the UK government do to better support this and facilitate co-investment? How does this differ across infrastructure classes?

See our answer to Q7.

Q16. What are the barriers to competitive industrial activity and increased electrification, beyond those set out in response to the UK government's recent Call for Evidence on industrial electrification?

In addition to the recent CfE, the ADE would like to note three additional barriers to industrial electrification and competitiveness: (1) no clear path for Combined Heat & Power (CHP); (2) the Government's lack of focus in supporting private wire and/or microgrids; and (3) carbon pricing policy.

CHP. CHP has multiple benefits: primary energy savings and efficiency (producing **both** electricity and heat from one fuel input), potential for green fuel, multiple use cases (not just industrial processes), is an enabling tool for heat networks, is an important support for difficult to decarbonise industrial sites, alleviates pressure on the grid and system security by contributing to a flexible grid. Some of the ADE's policy recommendations concerning CHP include: implementing REMA and zonal pricing to send flexibility signals to industrial CHP; reform the Capacity Market so that both large and small CHPs are able to participate and receive financial incentives; recognise green gas supplied through the gas grid as a low-emission fuel to reduce the use of emission allowances; respond to the two consultations listed below; and develop the CHP Quality Assurance scheme to be used as a credible pathway to fuel-neutral support. The ADE has written and shared a paper on the reform trajectory of CHP with the Department for Energy Security and Net Zero (DESNZ). We're in conversations with DESNZ on how best to support CHP through policy reform. In the meantime, the ADE calls on Government to formally respond to ['Combined Heat and Power \(CHP\): the route to 2050'](#) (consultation published June 2020).

Private Wire & Microgrids. The ADE calls on Government to formally respond to ['Exemptions from the Requirement for an Electricity Licence'](#) (consultation published October 2020). The lack of information on the feasibility of private wire leads to uncertainty, and therefore increases the risk for businesses

trying to electrify in a way that best fits their needs. The ADE believes there could be room for heavy industrial sites to decarbonise via 'microgrids' where a large industrial site (or a cluster of sites) could leverage a CHP coupled with thermal stores, solar PVs, heat pumps and battery energy storage systems (BESS). Clarity around the regulatory feasibility of this is needed.

Carbon Pricing Policy. Related to CHP, greater attention should be paid to the interaction between industrial electrification and the UK Emissions Trading Scheme (UK ETS), the Cross Border Adjustment Mechanism (CBAM), the Climate Change Levy (CCL), Carbon Price Support (CPS) and Climate Change Agreements (CCAs), collectively being referred to as 'carbon pricing policy.' The UK's carbon pricing policy will have a leading effect on UK industrial competitiveness and industry's ability to decarbonise by 2050.

Q17. What examples of international best practice to support businesses on energy, for example Purchase Power Agreements, would you recommend to increase investment and growth?

See "[The Co-Located Load Solution](#)" report by Michael Kormos, the former Chief Operating Officer at PJM (the Pennsylvania-New Jersey-Maryland Interconnection in the US), discussing the benefits of co-locating new US data centres at operating nuclear power stations in competitive electricity markets, including the ability to leverage existing infrastructure to avoid long connection delays. He argues that by partnering with an existing plant, the load avoids the long lead time for grid connection and the generator secures a steady customer, which can be critical for plants needing predictable, long-term revenues to ensure continued operation and justify renewal of operating licenses.

Kormos says "co-location could involve the pairing of any type of power plant with any large load," but focuses on existing US nuclear plants providing some of the best opportunities for new US data centres. Nuclear plants are large, often with multiple units, carbon-free and sustainable, and capable of and preferring to run at maximum power for up to 18 to 24 months, which matches perfectly with the data centre load profile.

Under a co-location configuration, the data centre gets the carbon-free electricity it wants without lengthy delays (but must pay for any on-site delivery facilities, similar to a Purchase Power Agreement), and the nuclear plant gets a steady customer (forestalling premature retirement). And with the nuclear unit now supplying the data centre load and not some distant network load, deliverability on the transmission grid is freed up for other existing and newly connecting resources, like wind and solar projects.

Q18. Where you identified barriers in response to Question 7 which relate to competition, what evidence can you share to illustrate their impact and what solutions could best address them?

Q19. How can regulatory and competition institutions best drive market dynamism to boost economic activity and growth?

Recommendations made for Government in the ADE's report, [Demanding More](#), to reform the National Energy System Operator (NESO) should be carried out expeditiously, including encouraging Ofgem and NESO to do the same.

As the sole shareholder of NESO, Government must be more proactive in driving the radical cultural changes needed to make that entity deliver its statutory duties, as enumerated in the Energy Act 2023. NESO regulation must aim to improve the areas of persistent industry and regulatory concern, namely initiating a change of culture rather than just a change of name.

Electricity demand that is flexible under the right incentives could [save the system £14.1bn per year](#) and households hundreds of pounds on energy bills per year by 2040. Beyond small pockets of progress, NESO is still designing energy markets in a way that favours only a limited number of technologies and thus will not deliver the potential consumer savings that empowering the demand side could achieve.

Q20. Do you have suggestions on where regulation can be reformed or introduced to encourage growth and innovation, including addressing any barriers you identified in Question 7?

The ADE has 9 policy reform recommendations to unlock Demand Side Flexibility to aid GB's energy and infrastructure, which underpins all growth sectors.

1. The ADE believes Government should continue with the [Review of Electricity Market Arrangements \(REMA\)](#) programme and announce its intention to establish a zonal wholesale market in GB. Customers [are already exposed to different prices](#) depending on their location, with households facing a difference of £130/pa across GB. Without zonal pricing and the [£24bn](#) in consumer benefits it brings, we run a significant risk of losing public support for net zero as a programme. Further, we cannot continue to be in a situation where the price tag for resolving traffic jams on the wires has the potential to reach £3bn a year by the end of the decade. This is not a sustainable foundation for investment or energy consumers.

Quantitative evidence does not support the criticisms levelled at zonal pricing, particularly that it deters renewable investment. In fact, the opposite is true. American states with locational wholesale markets dominate the country's planned clean energy capacity and our world-leading Contract for Difference (CfD) programme will ensure the UK continues to attract investment where it is needed most. While not all ADE members agree with the introduction of a zonal wholesale market, we have taken the view that it will be essential for reducing consumer energy bills, promoting decarbonisation, and creating a secure and flexible energy system for the future.

2. The Measuring Instrument Regulations (MIR) should be amended to enable asset meters to engage in energy trading flexibility. Government ambitions for Clean Power by 2030 rely heavily on the rollout of low carbon assets that can function in a smart way such as EVs and heat pumps. However, due to regulations held over from an EU Directive (MIR), over 99% of assets may be prevented from being paid for smart performance. Market analysis conducted by ADE, at the request of DBT, is held confidentially by DESNZ and DBT. While a consultation was imminent pre-election, this has now once again been

stalled meaning it is almost two years since both departments were first made aware of this regulatory anomaly by the ADE.

We must reach a permanent and sustainable solution to this issue, bolster the government's clean energy strategy, without incurring any financial cost. DBT must update the MIR enforcement guidance to acknowledge that devices that are not compliant with MIR will not be precluded from participating in demand side flexibility trading until a future regulatory framework is implemented. A simple amendment to MIR Sch.2 delegating the power for regulating these devices to DESNZ would fulfil the legislative intent of the Energy Act 2023 and remain in the spirit of other exclusions in the regulation. The EV regulations and EVSCP requirements should be amended by DESNZ to align with MIR accuracy requirements of +/-2%.

3. Market Wide Half Hourly Settlement (MHHS) should be implemented without further delays with stronger action against those parties sowing the process. The introduction of MHHS is predicted to bring net benefits for consumers in GB of between [£1.6bn and £4.5bn by 2045](#). At present, and for the foreseeable future, flexibility services will be dominated by balancing markets, where service providers will need to prove to the buyer that the quantity of electricity promised has been provided. Half-hourly settlement is a prerequisite for participation in most of these markets. MHHS will improve the quality of information available to flexibility service providers, making meter readings more accurate, opening the ability for many consumers with short duration flexible assets to participate in a larger array of flexibility services.

4. Related to the above, in the interim, measures should be taken to enable asset meters that are currently stuck behind non-half hourly settled boundary meters to participate in flexibility services. Efforts must also be made to establish an interim solution for asset meters that are currently located behind non-half hourly settled boundary meters. The inability for assets that are readily available to participate in balancing services due to inordinate delays to MHHS is stifling short duration flexible asset participation. Furthermore, significant investment has been made in the flexibility sector on the basis of MHHS implementation timelines. As the programme is continually delayed, half hourly settled asset meters are precluded from markets due to a requirement to be associated with a half hourly settled boundary meter.

While this could be changed through a BSC modification, this solution entails timelines likely similar to MHHS. Therefore, swift and joined up action is needed from Government, Ofgem, and Elexon to establish an interim solution.

5. NESO operational metering requirements should be reformed immediately following the conclusion of the independent review in late 2024. Current NESO operational metering obligations require that meter readings are reported at 1 second intervals within 1% accuracy. This is contrary to the legislative accuracy requirements for all domestic meters (+/-2%). Providing meter readings every 1 second, even when assets are not participating in the BM would impose massive data costs, essentially obliterating the business case for domestic flexibility.

Objections to these requirements have been raised to NESO over the past five years, with a review now being conducted by independent consultants. As highlighted in the most recent [Future Energy Scenarios](#), electrical demand for road transport could reach 28TWh by 2030, the equivalent of over 10% of all national electricity demand in 2023. We cannot afford for short duration flexible assets, such as EV chargers, not being able to participate in balancing services.

6. The volume of skip rates in the Balancing Mechanism (BM) that take place as a result of legacy systems and the need for organisation wide cultural change should be drastically reduced. The capability of NESO to balance the system using small volume flexible assets rather than large generation must be improved by a significant reduction in skip rates, [averaged at 76% skips for batteries in August 2024](#). This issue was acknowledged in [Ofgem's 2022 Draft Determinations](#) and an independent consultant was commissioned by NESO to quantify the issue in October 2023, yet the outputs have been subject to a one year delay. Not just a battery issue, the recent 300MW operational metering exemption for small assets in the BM has seen that despite assets being able to enter the market, dispatch is exceptionally low, despite competitive pricing. This has also been [demonstrated in a recent trial](#) conducted by Centrica.

7. Improvements should be made to NESO ancillary service design to ensure that services are non-discriminatory and facilitate true technological competition. Despite five new balancing markets being launched since 2019, none have delivered more technological competitiveness than legacy, gas-dominated markets. Instead, they have been designed in a manner that systematically prefers battery storage, seemingly as a replacement for gas. The impact of this can be seen clearly in NESO's [Routes to Market Review](#) which conveys market barriers to primarily short duration flexible assets. With [electricity demand set to double](#) and a majority of flexible assets currently being precluded from ancillary service participation, our goals for net zero and clean power by 2030 are seriously at risk. Changes must be made to existing and new services to incorporate true technological competition including on issues relating to baselining, time to full delivery, and delivery intervals.

8. The Capacity Market (CM) should be reformed to remove barriers for low carbon, low capex contracts. Reforms to the Capacity Market are needed to strengthen security of supply and accelerate investment in low carbon technologies. Changes to achieve this include the provision of multi-year contracts and reducing capex thresholds for low carbon and capex technologies to provide a higher level of revenue certainty for short duration flexible assets.

9. The establishment and standing up of the market facilitator should be accelerated to ensure expeditious rollout of service stacking, primacy rules, and market coordination. The market facilitator will play a critical role in ensuring a sustainable future for demand flexibility through the coordination and standardisation of distributed markets. Building those responsibilities within Elexon must be accelerated beyond current stated timelines to ensure Elexon has the mandate to take a market wide approach to issues, including across their BSC responsibilities. Ofgem and Government must work with Elexon and industry to clarify this mandate and set clear expectations for the issues that will be prioritised from Day 1, including service stacking and demand turn up.

Q21. What are the main factors that influence businesses' investment decisions? Do these differ for the growth-driving sectors and based on the nature of the investment (e.g. buildings, machinery & equipment, vehicles, software, RDI, workforce skills) and types of firms (large, small, domestic, international, across different regions)?

Permanent expensing of investment would be welcomed. Historically, over 100% of relief measures have been used on a time-limited basis to support growth sub-sectors, advantaging UK businesses.

Q22. What are the main barriers faced by companies who are seeking finance to scale up in the UK or by investors who are seeking to deploy capital, and do those barriers vary for the growth-driving sectors? How can addressing these barriers enable more global players in the UK?

Q23. The UK government currently seeks to support growth through a range of financial instruments including grants, loans, guarantees and equity. Are there additional instruments of which you have experience in other jurisdictions, which could encourage strategic investment?

Q24. How can international partnerships (government-to-government or government-to-business) support the Industrial Strategy?

Linking the UK and EU Emissions Trading Scheme (UK and EU ETS) would provide a much-needed deeper pool and better pricing for participants, which would both encourage participation and further our carbon reduction goals. The ADE also believes we should be investigating integrating the UK and EU Carbon Border Adjustment Mechanism (CBAM), which might also assist in the same way as linking the UK and EU ETS.

Q25. Which international markets do you see as the greatest opportunity for the growth-driving sectors and how does it differ by sector?

Q26. Do you agree with this characterisation of clusters? Are there any additional characteristics of dimensions of cluster definition and strength we should consider, such as the difference between services clusters and manufacturing clusters?

We have a lot of pre-existing clusters from other schemes and plans. There are the [6 industrial clusters](#). There will likely be [11 regions for RESPs](#). Under REMA, the ADE has supported zonal pricing. In an effort to streamline, whatever clusters are formed per this Industrial Strategy, should complement the clusters/zones we already have.

Q27. What public and private sector interventions are needed to make strategic industrial sites 'investment-ready'? How should we determine which sites across the UK are most critical for unlocking this investment?

Support (via carbon capture and storage (CCS) and hydrogen) is already given to the 6 industrial clusters mentioned in our response to Q26. Half of industrial emissions are outside of these clusters and this half

will be much harder to decarbonise given the state of connections and the bespoke nature of these “dispersed” sites. There is a wealth of untapped potential in these dispersed industrial sites, and the jobs and communities they support. The ADE strongly recommends public intervention to include dispersed sites as “strategic” industrial sites.

Q28. How should the Industrial Strategy accelerate growth in city regions and clusters of growth sectors across the UK through Local Growth Plans and other policy mechanisms?

Local Area Energy Plans (LAEPs) in England and Wales are intended to identify suitable sites for large-scale energy developments and can be an important part of identifying strategic areas for industry, where there is enough grid capacity for sites and where any excess heat can be used in heat networks, providing benefits for both the industrial site, the area, and the grid. We encourage Government to consider merging LAEPs with Local Growth Plans, or laying out how exactly the two will interact.

Q29. How should the Industrial Strategy align with Devolved Government economic strategies and support the sectoral strengths of Scotland, Wales, and Northern Ireland?

Q30. How can the Industrial Strategy Council best support the UK government to deliver and monitor the Industrial Strategy?

While the ADE supports the formation of an ISC, it is too early to comment without more specifics to comment on. However, we’d like to see the ISC look into and initiate the reforms mentioned in Q20 regarding NESO.

Q31. How should the Industrial Strategy Council interact with key non-government institutions and organisations?

Q32. How can the UK government improve the interface between the Industrial Strategy Council and government, business, local leaders and trade unions?

Q33. How could the analytical framework (e.g. identifying intermediate outcomes) for the Industrial Strategy be strengthened?

Q34. What are the key risks and assumptions we should embed in the logical model underpinning the Theory of Change?

Q35. How would you monitor and evaluate the Industrial Strategy, including metrics?

The ADE would like to see Industrial Strategy metrics include Clean Power 2030 and Net Zero by 2050 metrics, to the extent relevant, in an effort to streamline, save reporting resources and to ensure our decarbonisation goals are met. Of course, Industrial Strategy metrics will, and should, be broader than these metrics.

Q36. Is there any additional information you would like to provide?

Our main constructive feedback at this time is that, essentially, the Industrial Strategy lacks specifics to comment on. In the discussion around Energy and Infrastructure, there was no mention of: the [6 industrial clusters and the 50% of industrial emissions that exist in dispersed sites](#); zonal pricing / [Review of Electricity Market Arrangements \(REMA\)](#); demand-side response / flexibility; or heat networks / district heating (see our separate Decarbonising British Heat response).

Additionally, there was no substantive discussion on how this Industrial Strategy, and its multiple levels of sub-plans will interact with the numerous other plans being formed simultaneously. There was no direct mention of the Strategic Spatial Energy Plan (SSEP), the Centralised Strategic Network Plan (CSNP) or the RESPs, which are all “whole system” plans. While all 3 plans (SSEP, CSNP and RESP) will presumably operate within this Industrial Strategy, we’re concerned with Government’s ability to execute the intricacies of executing so many layers of plans, across departments, without creating any contradictory policy objectives. The ADE has noted our concerns over “plan fatigue” in our RESP consultation response. Indeed the 8 Sectoral Plans will each be broken out into subsectors, we also have the Clean Power 2030 mission, Local Area Energy Plans (LAEPs), planning reform through Ministry of Housing, Communities & Local Government (MHCLG) and this Industrial Strategy introduces new Local Growth Plans. We encourage DBT to ensure collaboration with DESNZ and other Government departments to coordinate wherever possible.

Lastly, similar to “designated” projects within the connections queue, the ADE will want to see what sort of methodology will be applied to selecting “strategic” industrial sites. The consultation does not expound on this and we look forward to hearing more about it.

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