IET response to DESNZ's 'Gas system in transition: security of supply' consultation

About the IET

The IET is a trusted adviser of independent, impartial, evidence-based engineering and technology expertise. We are a registered charity and one of the world's leading professional societies for the engineering and technology community with over 158,000 members worldwide in 148 countries. Our strength is in working collaboratively with government, industry and academia to engineer solutions for our greatest societal challenges. We believe that professional guidance, especially in highly technological areas, is critical to good policy making.

To discuss this response further, please contact policy@theiet.org to arrange a meeting with a member of the Policy Team.

IET recommendations:

- **Natural gas has a vital role across all phases of the transition:** Natural gas remains fundamental to the UK energy system today, during the transition to Net Zero, and into the post-2050 period. In the near term, gas underpins economic activity and energy security by providing flexible, dispatchable capacity. During the transition, it plays a critical system-balancing role as renewable penetration increases and electrification accelerates. Beyond 2050, gas infrastructure - potentially repurposed for low-carbon gases - will continue to support system resilience, security of supply and flexibility, even as overall demand declines.
- **Indigenous gas enhances energy resilience:** Domestic gas production materially strengthens the UK's energy resilience by reducing exposure to physical imports from global markets, helps provide a hedge against global price volatility, geopolitical risks and supply disruptions. Indigenous gas is uniquely valuable in low-probability, high-impact scenarios, providing firm, rapidly available capacity to support intermittent generation technologies such as wind and solar. This system-support role cannot be fully replicated by imports or alternative technologies at scale.
- **Maintaining indigenous production delivers strategic and economic benefits:** There are significant strategic, economic and system-wide benefits to maintaining and enhancing indigenous gas production. These include improved security of supply, lower exposure to global price shocks, and the retention of critical skills, supply chains and industrial capability.
- **The role of UK gas production should evolve toward energy resilience:** As the energy system transitions, the focus of UK gas production should shift from competing directly with global gas markets to prioritising energy resilience and system support for the UK. This may involve managing production volumes strategically, alongside renewed exploration and licensing, to ensure that domestic production is available when it is most valuable — during system stress, supply shocks or prolonged periods of low renewable output. A managed transition of this kind preserves optionality and avoids premature loss of capability.
- **Protecting the gas production industry avoids costly capability gaps:** It is essential to nurture and protect the UK's gas production industry to avoid repeating past strategic errors, such as the loss of nuclear experience and capability following Sizewell B, which later required costly and time-consuming revival for Hinkley Point

C. Once industrial capability, skills and supply chains are lost, they are difficult and expensive to reconstitute. Maintaining gas sector capability supports both energy security and an orderly transition to Net Zero.

- **Indigenous gas reduces consumption-based greenhouse gas emissions:** liquefied natural gas (LNG) imports have significantly higher lifecycle greenhouse gas emissions than domestically produced gas, largely due to liquefaction, shipping and methane leakage. Extending the productive life of indigenous gas resources can therefore reduce the UK's consumption-based emissions, even if territorial emissions appear unchanged. This distinction is material and should be reflected in policy decisions if the UK is to make a genuine contribution to global emissions reduction.
- **A whole-system approach:** A whole-system perspective in energy planning and modelling is essential for success, and is pivotal to understanding technical interdependencies, assessing risks, and informing decisions on infrastructure investment and operation. This approach should reflect the full complexity of interactions across electricity generation, long-duration storage, transmission networks, baseline demand, demand-side response, interconnection, security, and other energy vectors. Adopting such an approach will improve system resilience, ensure that critical dependencies are recognised and managed, and reduce the likelihood that low-probability, high-impact scenarios lead to system stress.

<u>Questions</u>

1. *Do you agree with the assessment that, as supply from the UK Continental Shelf continues to naturally deplete, imbalances between supply and demand may become possible in low-probability, high-stress scenarios? Please provide evidence to support your answer.*

The IET agrees with the assessment that, as supply from the UK Continental Shelf (UKCS) continues its natural decline, imbalances between supply and demand may become possible in low-probability, high-stress scenarios.

The UKCS is in long-term decline, which will ultimately increase the UK's reliance on imported fuels and exposure to external risks. Evidence from the North Sea Transition Authority (NSTA) 2024 report indicates that remaining UK gas resources[1] are estimated to range between 4,627 TWh and 11,288 TWh with a central estimate of 7,589 TWh. At current rates of production[2], this would equate to approximately 20 years of supply. However, realising this potential would be contingent on continued oil and gas activity, including the licensing, prospective resources, and development of new fields. Without such activity, depletion is likely to accelerate, increasing the risk of supply–demand imbalance under stressed system conditions. This may mean treating indigenous gas production as a strategic resource that can provide further resilience to both the electricity and gas systems to provide back up to imports.

Gas currently plays a critical role in the electricity system due to its ability to respond rapidly to changes in demand, particularly during peak periods or system shocks. There is presently no alternative technology that can fully replicate this level of flexibility at scale. While hydrogen may in time provide some of this capability, this would still be dependent on natural gas via production through reforming technology.

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[1] Reserves + Contingent resources
[2] 344TWh DUKES 2025

As mentioned in our 'Core Principles' section, a whole-system perspective in energy planning and modelling is essential for success[3]. This should reflect the complexity of interactions across electricity generation, long-duration storage, transmission networks, baseline demand, demand-side response, interconnection, and other energy vectors. Adopting such an approach will improve system resilience, ensure that critical dependencies are recognised and managed, and reduce the likelihood that low-probability, high-impact scenarios lead to system stress.

2. *In light of the analysis outlining the priority of ensuring gas infrastructure capacity, do you think the market will respond to provide such insurance for low probability, high stress scenarios? Please provide evidence to support your answer.*

The IET does not consider that market mechanisms alone will reliably provide sufficient insurance for low-probability, high-stress scenarios, particularly in relation to gas infrastructure capacity. While markets are effective at optimising for expected conditions and short-term price signals, they tend to under-value resilience and rarely incentivise investment in assets that are required infrequently but are critical during extreme events. This was highlighted through the decommissioning and partial recommissioning of the Rough Gas storage facility.

Strengthening the resilience and security of critical national infrastructure, including electricity generation, transmission and distribution, is rightly a priority for Government and should be undertaken through a whole-system approach. As the UK progresses towards Net Zero, both the supply mix and demand patterns will change significantly. Attempting to manage this transition without an appropriate, coordinated strategy risks creating brittle infrastructure, where failures in one part of the system cascade into others.

Cyber threats, geopolitical uncertainty and the pace of Net Zero–driven change all point to the need for deliberate investment in resilience and mitigation planning to protect the UK's economic and national security. Rapid expansion of renewable generation, without a joined-up approach to public engagement on demand, variability and natural phenomena, could inadvertently reduce system resilience. The electricity system underpins all other critical sectors, meaning that disruption to the grid would have severe and compounding impacts across society.

Meeting Net Zero ambitions while maintaining security of supply will require electricity generation capacity to increase by a factor of two to three compared with today. Large-scale nuclear projects, such as Sizewell C, and the Small Modular Reactor (SMR) programme can make a significant contribution. However, these developments must be integrated within a whole-system view to ensure that nuclear generation complements, rather than displaces or constrains, other generation, flexibility and network assets.

The clarification of roles between Great British Energy, Great British Energy – Nuclear, and the National Energy System Operator (NESO) is welcomed. These upgrades are essential enablers of resilience and must be adequately funded and prioritised.

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[3] When considering different models, the IET suggests different system considerations are considered, for example[3]:

1. Extensive terrestrial CO2 network connecting CO2 hubs
2. No terrestrial CO2 network with an extensive H2 network
3. Mixture of 1 and 2, e.g. regional CO2 networks.

With respect to gas, the IET considers that Government intervention will remain necessary to ensure adequate infrastructure capacity. Prioritising the North Sea as a key source of gas imports, alongside continued development of reserves, contingent and prospective resources as categorised by the NSTA, would enhance resilience while reducing exposure to international supply disruptions. In 2024, only 33.8% of UK gas supply came from the British North Sea, with 50.2% imported from Norway, 11% from the United States and 5% from other sources.

In addition, reducing reliance on long-distance imports lowers associated methane emissions, which have a substantially higher global warming potential than CO_2. These impacts are material and should be fully accounted for when assessing the UK's genuine contribution to global emissions reduction, as they may not contribute to our territorial emissions, but do contribute to our consumption emissions.

As the UK transitions to a low-carbon system, the need for a reliable 'buffer' against unpredictable, high-impact events becomes increasingly important. Resilience planning must extend beyond average conditions to consider rare but severe scenarios. A diverse mix of renewable sources can reduce exposure to single-weather risks, but this must be complemented by firm capacity, storage, flexible demand and gas infrastructure that can respond rapidly when required.

Major grid restructuring must be managed carefully to avoid unintended impacts on system stability. Interconnectors play a valuable role in balancing supply and demand across borders, but their effectiveness is reduced when neighbouring countries experience the same extreme weather events. Energy storage, flexible demand response and secure domestic gas supply therefore remain essential components of resilience.

3. **We are not answering question 3**

4. *Do you agree with the assessment that ensuring resilient infrastructure capacity is a key priority as the gas supply mix changes? Please provide evidence to support your answer.*

As outlined previously, resilience is integral to longevity and should absolutely be a priority for DESNZ as the gas supply mix changes. The energy transition will require a huge number of, and appropriate investment in, skills and jobs to achieve adaptability, longevity and flexibility. The oil and gas sector has developed a large and sophisticated base of engineers, technicians and project managers with deep experience in complex offshore environments, skills that are highly relevant to emerging low-carbon industries.

However, three barriers must be addressed to realise this potential:

- **Salary disparities:** Oil and gas roles typically command higher pay due to the risks and profitability of the sector. Renewable roles generally offer lower remuneration, creating a disincentive for workers to transition.
- **Uncertain career pathways:** Without clear long-term signals, workers face uncertainty over opportunities in low-carbon sectors, making reskilling less attractive.
- **Location and concentration:** By definition, electrification will require plumbers and electricians spread evenly across the country, however, it is much easier to reskill, upskill and find apprenticeships in industry clusters whereby critical mass helps in the deployment.

5. *In light of the analysis outlining the priority of ensuring resilient infrastructure capacity, do you think the market will respond to achieve this priority? Please provide evidence to support your answer.*

Please see our responses to questions 1 and 2 for further information regarding the importance of a resilient infrastructure.

6. **We are not answering questions 6 and 7**

8. *Government's assessment is that existing LNG infrastructure is robust and commercially viable, do you agree?*

The IET agrees with the Government's assessment that the UK's existing LNG infrastructure is robust and commercially viable.

Evidence from recent experience demonstrates both its technical capability and commercial operability under stressed conditions. Analysis such as *The LNG Dilemma* highlights how Europe responded to the 2022 disruption of Russian gas supplies by rapidly increasing participation in the global LNG market. LNG infrastructure effectively acted as a flexible, high-capacity "stopgap" resource during a period of acute energy uncertainty. The prices paid by European markets at the time, reaching approximately $38–44/mmBtu, indicate not only the scale of immediate demand absorption but also the commercial viability of LNG across the full value chain, including terminals, regasification facilities, shipping and trading, even in highly constrained market conditions.

The speed with which LNG supplies were mobilised further underlines the maturity and adaptability of the infrastructure. Established terminals, well-developed shipping logistics and functioning trading mechanisms enabled LNG to respond rapidly to supply shocks, demonstrating that the infrastructure is not only technically robust but also capable of operating effectively during periods of geopolitical stress and tight global markets.

However, the long-term success of LNG infrastructure depends on the maintenance of a viable, stable commercial framework, and whole-system approach. LNG will have an enduring role as part of the transition to Net Zero, as well as post-2050 and as part of the H2 economy. Government should take care to avoid policies that could prematurely undermine its commercial viability. Rushed regulatory changes, levies or signals that imply a rapid and inflexible phase-out by 2050 risk discouraging investment and weakening resilience during the transition period.

9. **We are not answering questions 9 – 13**

14. *How can the strategic importance of interconnector capacity be protected, and what actions do you think might be required?*

Interconnectors are not only strategic assets, but key enablers of system flexibility and security, especially as the UK moves toward high renewable penetration, therefore, it is integral to protect interconnector capacity. Over-reliance on imports without robust interconnector protection could expose the UK to geopolitical and market shocks.

Interconnectors help balance variability by accessing wider European markets during stress events and should be safeguarded against physical and cyber risks. The importance of resilience planning for interconnectors cannot be underestimated; these plans should include physical protection, cybersecurity measures, and regulatory frameworks.

The IET's key recommendations for interconnectors are[4]:

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[4] 2025. Energy sector resilience position paper. IET. [Energy sector resilience position paper]

1. **Protect Physical and Cyber Integrity:** Ensuring physical security, and robust cybersecurity protocols, will heighten the resilience of supply.
2. **Interconnectors should be treated as a critical national infrastructure, not just commercial assets:** Government should avoid being over-reliant on imports by ensuring redundancy and planning for interconnector outages.
3. **Coordinate Cross-Border Resilience:** Agreements with EU parties would guarantee access during potential stress events.
4. **Integrate into Whole-System Planning:** See our 'Core Principles' section for further information.
5. **Regulatory and Market Measures:** Frameworks should incentivise availability during peak stress periods. There should be capacity mechanisms / resilience obligations for interconnector operators.

15. We are not answering questions 15 and 16

17. What are your views on the strategic storage options outlined above in relation to addressing the priorities set out in Chapter 2 (ensuring sufficient infrastructure capacity; ensuring resilient infrastructure capacity; and commercially viable infrastructure capacity)?

Storage is critical for system flexibility and resilience, especially during stress events and as renewable penetration rises. We have the storage resource and the engineering and financial expertise. We have seen with wind and batteries, that the industrial benefits of a new sector accrue disproportionately those countries who create a market and build an industry first.

The IET suggests:

- **Diversification of storage assets will be pivotal** to handling rare but severe scenarios.
- **Integration of storage into resilience modelling** for both short-term balancing and long-term security.
- **Investment in infrastructure and skills** to support emerging storage technologies and maintain legacy systems during transition.

18. We are not answering questions 18 and 19

20. What other factors, including gas usage and refilling terms, should be considered in any strategic gas storage proposal (either through new facilities or by securing capacity at existing sites)?

There are obvious factors that must be considered regarding gas storage; resilience, whole-system integration, and skills. Please see our 'Core Principles' section for further information.

21. We are not answering questions 21 – 34

35. To what extent do you think the current gas framework will remain fit for purpose over the coming decades? What changes, if any, need to be made and why?

In the midst of a shift away from fossil fuels, any future energy governance must be cross-vector to ensure resilience and net-zero alignment. Without having cross-vector governance, there is a concern that static frameworks risk becoming inadequate as the system evolves towards decarbonisation and multi-vector integration. Making a broader framework enhances resilience, flexibility, and adaptability.

Success of any frameworks will be dependent on their ability to be extended to incorporate developments of other energy sources. In addition to the environmental benefits of indigenous production, additional security or resilience of provided indigenous sources, and the benefit to the UK economy from a thriving oil and gas sector.

36. We are not answering questions 36 – 44

45. How could HMG best support the continued effectiveness and adaptability of the regulatory and market framework for LNG terminals, if needed?

Future-proof regulatory frameworks: Ensure LNG terminal regulations are flexible and adaptive to volatile global LNG markets, integration with low-carbon gases, evolving security and resilience requirements, and embed stress-testing and scenario planning into reviews. Market design and incentives: Ensure competitive access to LNG capacity while incentivising investment in flexibility, strategic resilience measures, and considering capacity mechanisms or resilience credits for LNG operators.

Security and Risk Management: Mandate physical and cyber security standards for LNG terminals and develop contingency protocols for supply disruptions and geopolitical shocks. Integration with Net-Zero Strategy: Align LNG market arrangements with decarbonisation pathways.

Collaboration and Governance: Government must strengthen coordination between Future System Operator, Ofgem, and DESNZ, international partners, and regularly review frameworks to ensure whole-system coherence.

46. We are not answering questions 46 - 51