Nuclear Industry Association Response to the Department for Business and Trade's 'Invest 2035: The UK's Modern Industrial Strategy' consultation.

The Nuclear Industry Association (NIA) welcomes the chance to respond to the Department for Business and Trade's 'Invest 2035: The UK's Modern Industrial Strategy' consultation.

The NIA is the trade association and representative body for the civil nuclear industry in the UK. We represent around 280 companies operating across all aspects of the nuclear fuel cycle, including the current and prospective operators of nuclear power stations, international designers, and vendors of nuclear power stations, and those engaged in decommissioning, waste management and nuclear liabilities management. Members also include nuclear equipment suppliers, engineering and construction firms, nuclear research organisations, and legal, financial and consultancy companies.

Due to the diversity of our membership, our views in this submission will cover high-level, industrywide matters. Our members may choose to make their own detailed submissions.

QUESTIONS

Sectors

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

a. Nuclear is essential to the UK's future energy technology mix as the only single technology that can provide clean, firm, and sovereign electricity, as well as providing a source of clean heat at scale.
   - Nuclear currently supplies around 15% of our electricity from just over half a square mile of land, and according to United Nations' analysis, nuclear has the lowest lifecycle carbon, lowest land use, and lowest impact on ecosystems of any electricity source.
   - The civil nuclear sector has a long history of delivering innovation and investment, creating high skilled jobs, and providing low carbon power across the UK. The number of people working in the civil nuclear industry in the UK is at its highest level ever with major new projects helping to drive a 60% increase in the number of jobs in a decade.
     i. Approximately 87,000 people work in the nuclear sector, with an average Gross Value Added per worker of nearly £100,000,about twice the national average.
     ii. Nuclear jobs are disproportionately in more deprived and rural areas: in England, about 40% of jobs are in the most deprived 25% of local

authorities, and in Scotland half of nuclear jobs are in the most deprived local authorities.

- The nuclear industry provides a vital engine of economic development outside London and the South East, as 85% of jobs in the industry are outside these regions.

iii. Over 29,000 people are employed in the North West in decommissioning, fuel cycle research and reactor design, and remains the sector's biggest regional workforce.

- Nuclear industry is a key driver of sustainable economic growth: for every £1 spent in the nuclear sector, there is a further £1.60 of indirect and induced economic activity created.

b. Advanced nuclear technologies, as well as gigawatt-scale nuclear, will have a crucial role in getting the UK to meet its clean energy goals, providing energy security and meeting our future global energy needs.
   - We need clean heat from advanced, high-temperature reactors to provide solutions for industries that are currently reliant on fossil fuels to reach the high temperatures they need.
   - A quarter of industrial processes across Europe depend on high-temperature heat. This heat could be generated by advanced nuclear technologies, such as Advanced Modular Reactors (AMRs) with output temperatures in excess of 700°C.
   - Advanced nuclear technologies are also capable of supplying heat for hydrogen production and replacing fossil fuel-generated heat for industrial processes. The small size, modularity, and flexibility of AMRs and SMRs are a major benefit in deploying these low carbon energy sources.
c. The availability of nuclear fuel will need to be scaled up as advanced nuclear reactors approach deployment in the UK and across the globe.
   - Many of the advanced nuclear reactors that are under development require High Assay Low Enriched Uranium (HALEU). The first deliveries of HALEU will be required beginning in 2028, however, Russia is currently the only viable supplier of HALEU to commercial reactor developers.
   - The UK is well-placed to help eliminate dependence on Russia for the OECD with work currently underway to bring western HALEU to market.
   - Not only is the expansion of our domestic capabilities and capacity strategically important, but advanced nuclear reactor vendors require optionality to obtain supplies from more than one country.
d. There is a long-term, high-value opportunity to create high levels of expertise in nuclear decommissioning and waste management in the UK with 17 sites, and more entering decommissioning in the next decade.
   - The size of the prize is significant, with around half of the world's currently operating nuclear reactors due to enter decommissioning before 2050 with each taking decades to complete.
   - Focusing on this sector can also help to create efficiencies to reduce the nuclear liability currently held by Government.

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

a. Advanced nuclear technologies (ANTs) are creating new opportunities for the sector. The economic effects of modular manufacturing used in the production of ANTs could be substantial, fostering job creation and supporting local industries.
   - ANTs could provide a versatile range of applications from producing localised power to supporting specific industrial processes.
   - ANTs introduce a range of decarbonisation opportunities, from grid electricity through to industrial heat, as well as in entirely new industries such as the production of hydrogen and synthetic fuels.

b. Nuclear fuel is one of the UK's greatest comparative strengths in the nuclear sector.
   - The UK owns 1/3 of Urenco, the largest enricher in the Western world and the leading exporter in the nuclear sector.
     i. About 80% of output from Urenco's enrichment facility at Capenhurst, worth about £300 million per year, is exported.
     ii. Urenco is also the sole supplier of enriched uranium to Ukraine, which relies on nuclear for the great majority of its wartime electricity generation.
     iii. Westinghouse's fuel fabrication facility at Springfields is also a key strategic capability: it is the sole supplier of the UK's Advanced Gas-Cooled Reactors (AGRs), which supply about 12% of the country's electricity. The majority of Springfields output is exported to France to help supply their nuclear fleet, which is the largest single source of power in all of Europe.

c. The UK, and Canada, are the only major Western nations that are net exporters of nuclear fuel products, and this capability is crucial to drive Russia out of Western nuclear fuel markets. The political imperative to replace Russian supplies across the OECD offers the UK a key opportunity to secure long-term, high-value exports that support skilled jobs in the UK.
   - Urenco at Capenhurst is making key investments to modernise its enrichment facilities to preserve its vital production.
   - Westinghouse at Springfields hosts the only mothballed uranium conversion facility in the world, which could be brought back into production.

d. Urenco at Capenhurst is at very forefront of the UK's uranium enrichment capability. The facility will have the capacity to produce up to 10 tonnes of high-assay low-enriched uranium per year by 2031. Currently, only Russia and China have the infrastructure to produce HALEU at scale
   - The facility will support around 400 jobs and will enable the UK to fuel advanced reactors around the world.

e. The UK has one of the widest ranges of decommissioning expertise in the world because the UK deployed the greatest variety of commercial and experimental reactor designs of any major nuclear nation. The nuclear decommissioning

sector also benefits from having a single, publicly owned organisation, the Nuclear Decommissioning Authority (NDA), which manages waste management and decommissioning processes across the country.

- The NDA Group has developed solutions using both robotic and autonomous technologies to both reduce risk and increase efficiency.
- They have built a highly skilled workforce and an extensive supply chain that has put the UK at the forefront of hazard management and developing solutions to complex problems.

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

a. Nuclear projects have proportionally higher upfront capital costs and as such, it is crucial to deploy a fleet of nuclear reactors and a series of parallel projects with overlapping construction periods, rather than taking a one-by-one approach which is more costly and lengthy.
   - Government must deliver on its commitment to bringing Sizewell C, a replica of Hinkley Point C, and the beginning of a programmatic approach to nuclear, to Final Investment Decision (FID) by Spring 2025.
   - A programmatic approach ensures continuous improvement, application of lessons learned, and retention of key capabilities.
   - It also provides the demand to keep workforces mobilised and to strengthen our project management expertise.

b. The Government should complete the SMR competition and guarantee the winners orders for reactors at specific sites.
   - SMRs will allow the UK to maximise investment and clean power generation at its existing nuclear sites. SMRs offer an opportunity for UK industry to make nuclear components that they do not have the capability to make for large-scale reactors. To do this, however, a fleet of SMRs will have to be ordered to justify investments in new, capital-intensive industrial fabrication capabilities

Business Environment

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?

a. Government should ensure that it takes decisions on bolstering support for new generation technologies, fuel production facilities and nuclear projects without delay, to retain and continually build appetite for the UK market. This will in turn encourage greater supply chain investment in the energy industry.

b. Industry cannot make major long-term capital investments in nuclear fuel facilities unless they know that Russia will not be able to distort the future market by undercutting Western suppliers.
    - Government should focus on enabling commercial investment into these facilities by sending strong demand signals to industry. This can be done through setting clear, coordinated rules about which suppliers can access the market or through direct support to increase fuel supply, but in a way that does not undercut viable commercial options.
c. We would urge Government to resolve the current lack of clarity around financing and future nuclear projects as policy certainty is critical to investor confidence and essential for new projects to be brought to market.
d. Other barriers to investment include the skills shortage, the planning regime and the regulatory system.

Business Environment – People and Skills

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?

a. The skills gap in the nuclear sector must be addressed by government so that we have the right people, in the right roles at the right time to deliver nuclear projects.
b. A supportive policy and regulatory environment for civil nuclear is key for attracting and retaining talent in the sector. Greater government understanding and coordination of supply chains in the sector would help to ensure that projects don't compete for the same resources.
c. Greater encouragement from Government for students to study STEM subjects to support a career in nuclear would also provide a larger pool of suitably qualified graduates to work in nuclear.
d. We would also encourage Government for greater support for flexible working and further support and initiatives to allow those already working in industry to train future generations.

Business Environment - Infrastructure

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?

a. An effective planning system is fundamental to enable new nuclear projects. Every nuclear power project that has engaged with the Nationally Significant Infrastructure Projects (NSIP) planning regime has faced decisions and processes that imposed costs, delays and obstacles severely disproportionate to any prospective benefit.

Net Zero Duty

b. We would encourage Government to put a duty on public authorities and key Government Departments, including PINS, DEFRA, Devolved Regulatory Bodies, DESNZ, Local Planning Authorities, HSE and the ONR, that makes them take account of urgent need for low carbon energy and energy security in all decision making.
c. All public authorities should have a clear statutory duty to prioritize the development of low-carbon energy sources and take a holistic view of environmental considerations. This would ensure that planning decisions are aligned with the broader national goals of reducing carbon emissions and ensuring a reliable energy supply.

Judicial Reviews

d. Judicial reviews can be a significant source of delay for infrastructure projects, particularly when they are used to pursue "frivolous/vexatious" claims.
e. The High Court dismissed a legal challenge against the Government's decision to approve the development consent order (DCO) for Sizewell C. An application for Judicial Review was brought by Together Against Sizewell C who made a series of claims about the DCO decision which were all rejected by the judge. In his judgment, Mr Justice Holgate said several of the claims were "totally without merit".
f. We urge Government to align with recommendations from Lord Banner's review of Legal Challenges to Nationally Significant Infrastructure Projects.
g. We would also ask Government to consider raising the liability cap under the Aarhus Convention above £5,000 to discourage "frivolous" claims through the courts. This would ensure that only serious and well-founded challenges proceed, reducing delays in project implementation.

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?

a. Investment in nuclear infrastructure can unlock major local investment and job creation, as well as crucial orders for the industrial supply chain. The construction of Hinkley Point C has tripled the size of the nuclear workforce in the South West, from 8,500 workers in 2014 to over 27,000 today. The project has also brought £5.3 billion of investment into the region, with the benefits soon to be replicated by Sizewell C in Suffolk.
b. Innovations in advanced nuclear technology have helped drive the number of jobs in the UK, with a growing workforce of over 700 people developing Small Modular Reactors. SMR deployment could create thousands of jobs.
c. Government can facilitate this co-investment by providing the funding models and the strategic equity investments as required for a new nuclear programme, including the following:
    - Supporting Sizewell C to a Final Investment Decision in 2025: Sizewell C as noted would bring benefits on a similar scale to Hinkley Point C.
    - Choosing winners in the SMR selection process and placing orders for those designs, which would generate billions of pounds in investment each
    - Setting out the pathway for another large-scale nuclear project, potentially ay Wylfa in North Wales. This would prospectively represent the largest single inward investment in Welsh history and generate economic benefits on the same scale as Hinkley Point C and Sizewell C.

Business Environment - Regulation

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?

a. There are significant opportunities for streamlining regulation to encourage growth and innovation in the sector.
b. The regulation process should focus on increasing efficiency with actions that will result in shorter time scales for deployment, whilst maintaining the current regulatory standards.
c. UK regulators should be open to, and encourage, the leverage of international experience and best practice to minimise design variations and facilitate replicability in the construction of nuclear reactors.
d. The regulatory bodies involved in the planning, permitting, licensing, and consenting processes of nuclear projects must also be properly resourced to deliver on commitments to encourage growth and innovation.

Business Environment – Crowding in Investment

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)?

a. The main obstacle to greater private sector investment in nuclear is the lack of certainty on government support for specific nuclear projects. Given the timescales, capital intensity and heavy regulation associated with nuclear projects, private sector investors want to know what risks the Government is sharing and mitigating.
b. We would welcome further clarity on the role of Great British Nuclear (GBN) in the delivery of new nuclear projects and the role of Great British Energy (GBE) in these projects.
    - As a government owned body supporting the delivery of privately led nuclear projects, the unclear position of GBN could potentially lead to a delay in privately funded projects coming forward while they wait for this clarity.

Business Environment – Mobilising Capital

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?

a. Nuclear financing requires governments and banking institutions include nuclear in their definition of "green" or "clean" technologies.
b. We would encourage Government to learn from Canada and designate nuclear as a sustainable activity to guide private sector investment and make nuclear projects eligible for the receipts of green bonds issued under the Green Financing Framework.
c. In 2022, Canada updated its Green Bond Framework to allow net proceeds from green bonds to be used to finance maintenance and/or refurbishment of existing nuclear facilities. In July 2022, Ontario Power Generation issued $300 million in green bonds for the CANDU refurbishment programme at the Darlington nuclear power plant. Bruce Power has issued more than $1 billion in green bonds for nuclear since their program began in 2021.
d. The Canadian federal government issued its second green bond of $4bn earlier this year, in which nuclear was included, and received orders for $7.4bn, an 85% oversubscription rate.

e. Revising the UK's Green Finance Framework to include nuclear will allow the proceeds of green bonds to be used to finance nuclear projects.

Further Information

The NIA is happy to provide more context, or any clarifications desired on the content of our response and to ask our members where appropriate for additional information that may be useful.

Please contact Lauren Rowe, Senior Policy Analyst for the Nuclear Industry Association, at Lauren.Rowe@niauk.org to do this.