From Siloed Planning to Shared Insight

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The UK's nuclear renaissance will not be constrained by ambition; it will be constrained by supply chain capacity. For decades, the nuclear sector has operated in a siloed manner, with companies focused on their own programmes and supply chain needs, assuming their supply chain plans are resilient to broader market programmes and demands. With this thinking and this lack of alignment, supply chain conflicts are inevitable, as the current supply chain is expected to ramp up to meet impending nuclear growth. We have recently seen Civil and Military coming together to address skills challenges and ensure certainty of programme delivery; the same collaborative approach now needs to extend beyond skills to supply chain planning. Manufacturers, developers, government and investors all need a shared understanding of future demand if the UK is to deliver multiple nuclear programmes simultaneously.

Understanding the UK's Nuclear Supply Chain Challenge

For many years, the NucCol team has gathered information through their individual and collective engagements in the sector. Through the Catapult network, sector initiatives such as GBN and through industry experiences. Over the last 12 months, we have brought our experiences to bear and created a 'Demand Model'.

Unlike traditional supply chain studies that assess current capability, the NucCol Demand Model forecasts future product demand by combining reactor bills of materials with deployment scenarios across the UK's planned nuclear programme. This enables us to understand not just what products will be required, but when demand peaks are likely to occur and where capacity constraints may emerge.

We understand how the lack of collective programme visibility has created challenges for manufacturers, investors, and programme leaders alike. Without a clear picture of aggregated demand across current and future nuclear programmes, it is difficult to assess whether sufficient UK manufacturing capacity exists, where future constraints may emerge, and where investment should be targeted.

Why is this important?

Through our **Fit for Nuclear (F4N)** programme and database of over 3,500 UK manufacturing and non-traditional manufacturing companies, we work closely with companies seeking to enter or expand within the nuclear sector. One of the most common questions we encounter is:

"What is the scale of the opportunity, and when will demand occur?"

For many UK businesses, understanding future nuclear demand is critical to shaping investment decisions, capability development and long-term growth strategies. The demand model will provide those companies on the NucCol F4N programme with the market intelligence needed to support their investment planning, target diversification opportunities, and address emerging UK supply chain pinch points.

While significant effort has been devoted to understanding the capabilities and gaps within the UK nuclear supply chain, far less attention has been given to understanding whether the sector has the capacity to meet future demand.

Our demand model helps address this challenge by providing insight into:

- Future product and system demand across UK nuclear programmes.
- Potential manufacturing capacity constraints.
- Areas where supply chain investment and development should be prioritised.
- Opportunities to maximise UK content and strengthen domestic capability.

By bringing greater clarity of future demand, we can help industry, government, developers and manufacturers make more informed decisions and ensure the UK supply chain is ready to support the next generation of nuclear projects.

Turning Demand Data into Action

The outputs from the Demand Model provide a dynamic view of how demand for specific products, materials and systems is expected to evolve across the UK's planned nuclear programme. The images below, taken directly from the Demand Model, quantify future demand for materials such as structural steel, reinforcing bar, and concrete, as well as specialist equipment and components, over the lifetime of planned reactor deployments. By comparing this projected demand with known UK manufacturing capability and capacity, the model enables us to identify where sufficient resilience already exists and where intervention may be required.

This insight helps determine whether demand peaks can be managed through programme sequencing to reduce pressure on the supply chain or whether sustained demand justifies investment in additional UK manufacturing capability and capacity. Providing this level of foresight enables industry, developers and government to make informed decisions early, giving the supply chain the time needed to invest, grow and respond before constraints impact programme delivery.

Rather than presenting a static snapshot, the model is built on continually evolving master data, with assumptions and programme intelligence updated as new information becomes available. This ensures the analysis remains current throughout the lifecycle of new build programmes, supporting decisions from early development through to delivery.

Developing new manufacturing capability and capacity takes time, making early visibility essential. By providing forward-looking intelligence, the Demand Model enables the sector to move from reacting to supply chain constraints to proactively planning the investments and interventions needed to maximise UK industrial participation and ensure successful programme delivery.

Understanding demand is the first step towards building the capacity needed to deliver the UK's nuclear future...some key insights.

Steel and Construction

- UK rebar supply may be insufficient to meet simultaneous demand from nuclear, clean energy and infrastructure projects; the UK has around 1.3 million tonnes of carbon steel rolling capacity at present.
- Specialist nuclear concrete production capacity may become constrained.
- Lower-cost imported steel sections and plates may be preferred over UK-produced material. Noting that the UK cannot currently roll stainless steel plate.
- Competition from non-nuclear construction and infrastructure projects could constrain steel availability.

Mechanical Equipment

- The UK's general pump manufacturing position is healthy. However, nuclear-qualified reactor coolant pump production is a narrow specialist capability.
- The absence of UK spent fuel cask manufacturing represents a significant supply chain gap.

Strategic Materials

- The UK remains dependent on international supply chains for refined copper and nickel.
- The UK's downstream manufacturing capability provides resilience despite reliance on imported refined metals.

Final Thoughts: The real question isn't capability; it's capacity!

The nuclear sector has spent years asking whether the UK supply chain has the skills and capability to deliver. The more pressing question now is whether it has the capacity to deliver everything currently being planned, and that challenge is growing by the month.

On the defence side alone, the demand is formidable. The Dreadnought-class programme continues at pace while the UK has committed to building up to 12 SSN-AUKUS attack submarines alongside it. Both classes share Rolls-Royce reactor technology. The Government has backed this with a £6bn commitment over the Spending Review period to move toward continuous submarine production, roughly one boat every 18 months.

Civil new build adds another, equally demanding layer. Alongside the UK's GW-scale reactor programme, the pipeline of SMR and AMR ambition is now substantial. Rolls-Royce SMR is progressing with an initial fleet of three units. SGE has proposed a fleet of up to 14 GE Hitachi BWRX-300 SMRs. Holtec and EDF have submitted proposals for up to four SMR-300 reactors at Cottam. Westinghouse is looking at a fleet of four AP300 SMRs. And Centrica and X-energy are advancing plans for up to 12 Xe-100 high-temperature gas reactors at Hartlepool. There will also likely be other programmes submitted to the UK's Advanced Nuclear Framework, creating an additional pipeline and demand on the supply chain.

Then there's fusion. STEP's prototype plant at West Burton has moved from research into delivery, with a construction partner now appointed and early enabling works under way. A programme that, alongside the wider Trent Supercluster, will draw further on the same regional supply chain, skills base and construction capacity as the reactor fleet around it.

Behind all of this sits the UK's ongoing decommissioning mission. The NDA group already spends close to £1.9bn a year with its supply chain, a figure only set to grow as the AGR fleet transfers to it over the next two decades.

Individually, each of these is a credible, well-backed programme. Collectively, defence, civil new build, fusion and decommissioning together have the potential to transform the scale of demand placed on the UK supply chain, all drawing on the same limited pool. Without a shared understanding of that future demand, which the Demand Model could provide, we risk creating avoidable bottlenecks, delaying projects, and missing a once-in-a-generation opportunity for UK industry. Better data, greater collaboration, and earlier investment decisions won't just improve delivery. They will determine whether the UK's nuclear ambitions become reality.

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