

# Small Modular Reactors: Why this matters now

The announcement that Rolls-Royce is building one of the UK's first Small Modular Nuclear Reactors (SMR) in North Wales is far more than a technical project or a regional development story. In Heligan's view, this is a national-level signal of intent. A step that brings together UK industrial heritage, national security priorities, energy resilience and long-term economic ambition. And like so many enabling technologies that later become civilian workhorses, SMRs have their origins in a deeply military lineage.

This technology was not dreamt up in a conference room in 2025. It traces its roots directly back to the Royal Navy's nuclear-propulsion programme. For over sixty years, the UK has designed, fuelled and operated naval reactors that power its attack submarines and ballistic missile boats. Those systems have been engineered under some of the strictest performance and safety constraints imaginable. Long-endurance missions, silent running, zero-failure tolerance and a deeply embedded safety and security culture. Rolls-Royce's Submarines business at the Raynesway site

in Derby has been the technical centre of this effort, refining compact, high-energy-density reactors capable of operating for decades without refuelling. That body of knowledge, the materials science, the manufacturing methods and the systems engineering discipline is the quiet foundation upon which today's UK SMR capability rests. It mirrors the way DARPA's early investments in packet-switched communications seeded the internet. It's another example of the long tail of military innovation eventually diffusing into civilian life.

The Rolls-Royce SMR itself is a modular 470 megawatt reactor, specifically designed for repeatable manufacture – to put that into context, that is the equivalent of more than 150 onshore wind turbines, that can power 1 million homes. The intention would be that these SMR's are locally provisioned instead of building bespoke, gigawatt-scale nuclear plants like the projects at Sizewell C or Hinkley Point. The philosophy is to industrialise nuclear energy, to make the product standardised, predictable and economically viable, rather than decade-long civil engineering epics.

This approach brings benefits that matter enormously to the UK energy ecosystem. Output becomes predictable and deployment becomes faster. Land requirements become smaller and the likelihood of cost escalation diminishes. For North Wales, the project creates a regional cluster of nuclear expertise and high-value jobs. For the UK, it lays down a template for a repeatable, exportable capability rather than a one-off national monument.



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Across defence, Critical National Infrastructure (CNI) and the broader economy, the potential applications are substantial. CNI is becoming more energy-intensive and more vulnerable to attack and disruption. Data centres, which themselves are now implicitly part of CNI, need huge quantities of stable, low-carbon power. Industrial clusters require baseload energy if they are to decarbonise. Major defence and national security sites depend on reliable, high-availability electricity that is not hostage to global gas markets or hostile interference. SMRs provide answers to all of this, either through co-location with energy-hungry facilities or through strengthening the resilience of regions with high concentrations of sensitive assets. And while the North Wales project is explicitly civilian, the implications for defence are immediate and clear. The stronger the civil nuclear supply chain becomes, the more robust the industrial backbone supporting the UK's resilience will be.



This all sits neatly within the UK Government's broader nuclear ambition. The current roadmap calls for 24GW of nuclear capacity by 2050, delivered through a combination of traditional large-scale plants and a fleet of SMRs. The intention is not only to secure energy independence and support Net Zero, but to create a domestic reactor industry that can compete internationally. The UK is signalling that it wants to manufacture reactors the way it manufactures aircraft engines: to a repeatable standard, at scale, with a clear export proposition.

Why this matters now is straightforward. Energy is both power production and a projection of power. The UK's energy system is under strain from a massive increase in the electrification of vehicles and other transport modalities, geopolitical volatility and an aging infrastructure. As renewables continue to scale, the grid becomes more dependent on a firm, controllable source of power. Without nuclear, and specifically, without deployable SMRs, the UK's Net Zero model becomes extremely difficult to realise.

The SMR programme provides an anchor of reliability and sovereignty in a world where both are becoming strategically scarce. It strengthens the CNI, reduces exposure to external shocks, supports defence and intelligence facilities, and rebuilds an industrial capability the UK allowed to contract for decades. It also sends a signal internationally that the UK intends to remain a serious nuclear-engineering nation with competitive products, not just a buyer of others' technologies.

Heligan firmly believes that the North Wales announcement is therefore not just an energy story, it is a national resilience story, a defence industrial story and a strategic choice about the kind of country the UK wants to be in the second half of the century. SMRs give the UK something precious, the opportunity to align economic growth, energy sovereignty and national security in a single, technically credible programme with global market potential. In other words, they give the UK a chance to stay in the nuclear game, on its own terms, and with its own technology, at a moment when very few countries have that luxury.