



Net Zero Review: Call for Evidence - MoltexFLEX

Introduction to MoltexFLEX and the FLEX reactor

[MoltexFLEX](#) is a privately funded advanced nuclear technology provider, looking to bring its molten salt reactor – the FLEX reactor – to the UK. MoltexFLEX offers a low-carbon and flexible energy generation solution for a 21st century decarbonised economy. The FLEX reactor is designed with simplicity in mind. It is a small modular reactor (SMR), allowing components to be factory-produced and readily transportable, reducing on-site work, increasing speed of construction and minimising overall costs.

Each reactor produces 40 MW of thermal energy – enough to power around 40,000 homes. The reactor can produce electricity and heat at £40 per MWh and £10 per MWh respectively. This is a much lower cost than other nuclear reactors can achieve, and when financed at commercial rates, is comparable to offshore wind costs. Unlike other nuclear reactors, the FLEX reactor offers dispatchable energy to support the grid when it needs it most. The innovative design is inherently and passively safe, as it does not rely on any moving parts for its safe operation.

Response to questions

What more could government do to support businesses, consumers, and other actors to decarbonise?

What we ask of the government is simple: to consider a wider array of nuclear technologies in pursuit of its ambition to have nuclear power make up 25% of the UK's energy mix by 2050, and to provide the resources and political direction needed to make this a reality. The government has focused overwhelmingly on High Temperature Gas Reactors (HTGRs). HTGRs may turn out to be the right approach, but by failing to look at a range of options – including molten salt reactors (MSRs) like the FLEX reactor – the government is putting all its eggs in one basket. If HTGRs do not prove to be as efficient and effective as their proponents hope, the UK will lose out because it has not given sufficient consideration, funding or regulatory support to a wider range of possible technologies.

Many nuclear technologies are capable of being privately funded, and there are UK and global investors looking for the right opportunities to do so. But such investors need the right signals from the government if they are to invest in the UK as opposed to our international competitors. A clearly defined adaptive pathway for the development of nuclear generation on the necessary scale to achieve the UK's net-zero commitments, which embraces the opportunities that new technologies provide would help enable this.

Government needs to invest in the expertise required to provide effective policy and regulatory support (i.e. at BEIS and the ONR), including providing easier ways to engage with the ONR at an earlier stage in the technological and business development process. We would also welcome greater clarity around the announced "Great British Nuclear" proposals, including reassurance that the structure will enable technology development through to deployment, and in turn encourage investment from developers, advanced technology firms such as MoltexFLEX, and the wider supply chain.

There is also a present need for government to identify a broader range of potential sites for the deployment of advanced nuclear technologies. Many local and regional governments, and businesses, particularly in heavy industry, are interested in the potential of SMRs in

helping drive economic growth while reducing emissions. But current siting policy is largely the result of planning for large-scale conventional reactors. SMRs are more flexible in terms of their deployment potential, and so require a more flexible approach from central, devolved and local governments to enable the UK to succeed in this field.

How should we balance our priorities to maintaining energy security with our commitments to delivering net zero by 2050?

If the UK is to meet predicted demand for electricity by 2050, there needs to be broad support for different nuclear technologies. Nuclear energy is low carbon, with recent research demonstrating lower greenhouse gas emissions even than wind or solar power (Carbon Neutrality in the UNECE Region-Technology Interplay under the Carbon Neutrality Concept – Oct 22). By using nuclear energy for power and heating, we have an opportunity to decarbonise and secure our energy system.

The best way to ensure energy security is to have flexibility of energy production as well as diversity of supply technologies. The FLEX reactor can respond to market demand, and our molten salt technology allows us to store energy for deployment at times of peak demand, and can be deployed at scale in “fleets” of reactors for maximum impact. This makes it the ideal partner for intermittent energy producers, like solar and wind power.

What export opportunities does the transition to net zero present for the UK economy or UK businesses? Looking at the international market, what green opportunities are nascent or growing?

The net-zero agenda will provide enormous export opportunities, including in advanced nuclear. The FLEX reactor is flexible and can provide one of the lowest-cost source power generation capabilities for a range of applications globally. A major challenge for developing countries is access to affordable advanced low-carbon technologies. The FLEX reactor removes that barrier with low construction and operational costs and the use of low-enriched uranium fuel, expanding the potential export market significantly. With appropriate support to advanced technologies such as the FLEX reactor, the UK could be a manufacturing hub, a base from which we could supply this technology to the world. That would have a long-lasting impact on UK manufacturing, nurturing an advanced scientific supply chain, providing highly skilled jobs and helping to cement the UK’s reputation as an incubator for technology.

How many green jobs do you estimate will be created in your sector by 2030?

MoltexFLEX has already created high-value jobs in Warrington – funded by the private sector – with an investment of over £6m into technology development. We plan to significantly increase our UK staffing numbers if we can move forward with BEIS and the regulator. We also need to make sure we propagate existing expertise (for example, in graphite and high-temperature steel from the Magnox and AGR programmes) by encouraging investment in fields of mutual interest to advanced nuclear technology developers, or the UK risks losing valuable knowledge and top-quality British experts to other countries’ nuclear programmes.

The UK nuclear supply chain would also be a major beneficiary commercially speaking, as there would be a variety of services and components which would need to be procured for the programme. Additionally, delivery of an “at scale” fleet of molten salt reactors could help to reinvigorate the nuclear sector in the UK, and in the longer term rebuild and re-establish itself, following a period of relative stagnation.