



APPG on Small Modular Reactors

Meeting with Last Energy - Can my town host an SMR?

Time: 12.30 - 13.30

Date: 8th November 2022

Location: Room Q, Portcullis House

Attendees:

- Virginia Crosbie MP (VC)
- Liz Saville Roberts MP (LSR)
- Baroness Bloomfield (BB)
- Trudy Harrison MP (represented by a member of staff)
- Mike Reynolds, UK CEO, Last Energy (MR)
Michelle Brechtelsbauer, VP Strategy, Last Energy (MB)
Gethin Jenkins, Head of Safety and Licensing, Last Energy (GJ)
- Havard Hughes, Secretariat
- Daniel Paterson, Secretariat

Liz Saville Roberts MP opened the meeting due to notification of late arrival by Virginia Crosbie MP. Havard Hughes (HH) introduced Mike Reynolds (MR), Michelle Brechtelsbauer (MB) and Gethin Jenkins (GJ) from Last Energy.

LSR invited Last Energy to make their presentation.

MB - Highlighted the Importance of energy to human and economic development and for progress, communities, national and global. Wanting to ensure that new energy solutions being presented fuel the growth needed for a secure energy supply, and that they are affordable, reliable and clean. Highlighted the issues around sustainability and scalability of nuclear technology currently in the market both in the UK and globally. Thesis of Last Energy is therefore to put forward a product that is scalable and a commercial delivery model that addresses current issues within the nuclear industry.

Key elements:

1. Important to develop a product, not a project. With a design that focusses on manufacturing from a mass production point of view
2. This would create a standardised product that can be used in series across a project, including through supply chain
3. Important that such a solution be financeable, focussing on private rather than public sources of capital

Technology overview

Last Energy prefer 'Manufacturable Micro Nuclear Power Plant' term, to Small Modular Reactor. This reflects the fact that the product is micro in nature vs. SMR, there are different definitions of 'modular' across industry and the fact that the design is constructed around more than just a reactor, it is the whole plant.

Key facts about design:



- 20 Mega Watts of Electrical output, around 60 Mega Watts (Thermal)

No piece of equipment or fuel within the micro plant will be bespoke, everything within the design is already in operation in dozens of nuclear plants globally. This means that the components will be familiar to regulators and suppliers alike.

- Manufacturability and standardisation

Each element of the Last Energy plant is '[skid mounted](#)', coming together like a Lego kit and allows for production of modules in a factory setting before delivery to site; allowing for rapid on-site build and minimal disruption to the local area in terms of construction.

Construction period is 18-24 months, with the majority taking place in-factory. Onsite construction is last six months; delivery of modules, construction, testing and commissioning.

Model is to allow for a manufactured standard issue plant to be built every time in order to maximise economies of scale from a series production.

- Air-cooled power plant, using fans instead of water. This is allowed by the micro nature of the plant (1/2 acre), fitting comfortably within a football pitch.

Air-cooling means there is no need to be located in close proximity to a large body of water, as a traditional nuclear plant would require.

- Delivery model

Last Energy handle all regulatory, building, financing and delivery of energy

End user will simply contract for the product required; energy in the form of electricity or heat.

Long-term power purchase agreements (PPA) when selling to industrial users and options including build and operate or joint venture models with utility partners, as per agreements in third countries that Last Energy is currently operating in.

- Financing

Design requirement for Last Energy is that each plant needs to be costed at under \$100,000,000.00 total. This allows for sourcing of private project capital without reliance on local country governments for financing of project delivery.

Areas where such technology has unique service provided in UK market and would be initial target markets

1. Ability to scale up energy on the basis of requirement, regardless of geographical area. Initial projects being planned are focussed on industrial clusters and freeports.
2. Areas which have energy requirements and need to replace existing energy solution. In addition, distributive base load; taking advantage of ability to build away from water sources, providing energy for areas with poor grid connectivity or growing SME requirements (allowing companies to grow in situ)



Initial project plan is for 10+ manufactured micro nuclear power plants to ensure a secure supply chain

Siting: small, quick to construct and not requiring a water source means that it is possible to site in any area looking for clean base load power. Aim is minimise project risk and maximise project viability.

From risk perspective: Looking at existing nuclear sites, meeting political expectations of new nuclear builds and benefiting from local support. Also, looking at industrial clusters along with free ports to take advantage of the commercial opportunities.

Case Study: Project operating in a Polish 'Special Economic Zone' being akin to an industrial cluster or Free Port in UK. At present, there is no solution for a base load that allows for decarbonisation. The Polish example allows for ten power plants and has 12-18 year PPAs with individual industrial end users at site. The utility generator in this example is Last Energy. Although, there is also an example of a Poland-based project that is being operated jointly with an in-country local utility company.

Poland's heavy reliance on coal with heavy industrial requirements mean that they are developmentally ahead of UK, in regard to new nuclear projects.

Mike Reynolds (MR) - Poland borrowing from UK on legislation and regulation around Nuclear

MB – In regard to UK, what is Last Energy doing?

- Engaging with potential customers from commercial side, as part of that they are exploring potential project sites across the UK.
- Established a UK subsidiary in 2021, new CEO on board as of November 2022 and growing UK team.
- Seeking to become a licensable organisation in UK
- Engaging with BEIS and ONR and other regulators
- Actively building projects: Houston Texas this summer for testing, aiming to ensure deliverability to advertised timelines
- Looking to create a long-term localised solution, aiming to make nuclear ubiquitous to UK market and Westminster to therefore focus on growth and development

LSR – What is timeline for online date?

MB – 2025 for commercial online date, in Poland. Looking to develop solutions that can be delivered now not in 2030.

Havard Hughes (HH) – Where is LE in terms of regulatory process in Poland?

Gethin Jenkins (GJ) - Pre-licencing phase with PAA, process allows swift progress through to site specific stage. PAA and ONR are looking at where they can work together on cross regulatory issues. PAA don't have resources ONR have, looking at trying to find example projects to help improve process. Looking to help ONR work with PAA and Romania regulator.



MB – Not engaging in US licencing process at present. Working with ONR as approach is ‘risk informed’

Virginia Crosbie (VC) – How can we package SMRs for MPs?

MB – Last Energy are looking to develop dozens of projects, looking for community and political support to start initial phase. Looking to streamline regulatory and planning process.

MR – Important to focus on talking to local authorities about how to keep industrial jobs in local areas while meeting 2030 goals. Local Authorities can help bring parties together to ensure growth and creation of economic growth.

LSR – Current sites might allow for large scale and small-scale reactors. The existing sites in North Wales might allow for workforces to work with each other. In Wales co-working is important. Noticed a Bangor University connection.

GJ – Last Energy visited Bangor in October to talk about nuclear future and looking at the University test rig. Exploring opportunities in terms of sponsorship of students. Also, went up to Anglesey for a visit, could be an ideal site. Secondary site visited could also work as no need to disrupt local body of water.

Baroness Bloomfield (BB)– What is the prospect of bringing such products to non-nuclear sites, such as Port Talbot?

GJ – Process for such a site would be through Town and Country Planning, instead of DCO, risk is from local planning decision bodies

MR – First sites are going to need to be on nuclear land. Takeaway for MPs should be around pace of delivery, not ‘jam tomorrow’. Nuclear industry needs to show results in next five years and this approach is a way of achieving that.

LSR – What is the required footprint for a Micro Nuclear Power Plant?

MB – Half an acre for the reactor, the overall campus would naturally be larger from a security, safety and bio-diversity point of view.

BB – What does the supply chain look like?

MB – The business has been building a supply chain within the UK, Going through procurement qualification process and pre-qualification questionnaire (PQQ). Important to say that Last Energy do not just have a nuclear supply chain; many elements in the Last Energy design are interchangeable with other forms of energy plants (biomass). This creates an ‘energy supply chain’, instead of pure nuclear and this helps to de-risk overall supply chain. The Business has focussed on building in multiple suppliers and redundancy. Looking to develop partnerships with existing skid mounting manufacturers in the UK to work with initially and then build out from and vertically integrate, once concept is proven.

LSR – Can you talk more about the financing, specifically equity contribution agreements?

MB – When funding projects, Last energy are looking for private capital, traditional energy and infrastructure financing. Company policy of no Russian or Chinese financial interests. Last Energy



want to bring private finances to table to allow for scalability and avoid timeline issues around government funding model.

MR – Not big fans of Regulated Asset Base (RAB) model because it is not needed. The shorter build time allows for a de-risking of project financing due to not needing to carry the cost capital of long-build timings.

Something to think about is, what is the backend safety net and CFD structure. LE do not want to build a business on the back of a CFD, rather on the back of agreed PPAs with customers. However, if the aim is to bring down the cost of capital and roll such tech out at scale then having some form of CFD mechanism would be useful.

MB – When we talk about CFD, we're talking about something that might be more familiar in the wind industry, unlike a CFD associated with a project as Hinckley. Importance is that it is scalable, not just for LE but the whole SMR industry. CFD could provide certainty for a site that might not have an industrial user.

Currently have a CFD proposal in front of BEIS at moment. A communication challenge has been explaining what is being asked for; not a question of a large project with money up front and this can take a number of conversations to communicate the different nature of what is being sought.

VC – What is relationship with the new ministerial team?

MB – Met with the energy minister, not yet with Secretary of State for BEIS; although connected with members of the Secretary of State's team.

Working closely with civil service within BEIS over past three years; on nuclear and on GBN consultation and recommendations. Wanting to ensure that these channels understand that the Micro category of nuclear exists and ensuring provision of micro-lane to allow fast delivery through commercial means, instead of Government financing.

Important for HMG to understand that engagement is around policy issues, rather than funding requests.

LSR – What would the workforce size be in construction phase and what would it be once a plant is up and running?

MR – Not moving construction work forces site to site, due to factory builds – so no boom and bust in local areas rather building a workforce at manufacturing site over long period. In order to build 10s or 100s of these plants the key is to invest in existing suppliers and factories, working with the existing supply chain while building up new suppliers as well.

VC – What needs to happen in terms of timeline?

MB –

1. Site control: Once LE have site control and heads of terms are agreed with regulators, LE will initiate site licencing process for that site and for that project.

Already engaging with the planning consultancy WSP (formerly the Wood Group).



2. Site licencing process: Going through a generic process to get the business ready for activation on a real-world site
3. Project capital raise: a number of investors identified for a UK specific project.
4. Licencing: Engaging with regulators on process and design
5. Start of manufacturing: Already in contract phase for turbines and fuel

MR – The thing LE wish to specifically improve is the licencing process. Aim is to improve/speed up licencing, particularly the sequential nature – this works for one large scale site, not for multiple sites being delivered at pace.

HH - What is timeframe of getting through the approval process? The answer from former Secretary for BEIS (Jacob Rees Mogg) in early October was that it would take nine years.

MB – Do not accept that timeline. Engaging with regulators with a view to pushing for an as quick as possible timeframe. This reflects the smaller scale of micro reactors against those reactor projects that the regulator might be previously familiar with.

GJ – Challenge is communications with regulator and explaining tech, and challenging timescales. Focussing on sharing information with regulators and agreeing where they want further work doing on safety assessments. Regulators seem receptive but they need clarity, with the energy security strategy coming online. Regulators are likely to be stretched from a resource point of view but LE would like to be the first SMR project that goes through ONR process.

MR – Coming from a different part of the energy sector, I would say that there are more Government agencies involved in these decisions than there need to be.

VC – What are your thoughts on GBM?

MR – Not yet met them and have no thoughts on them as yet

MB – Sounds like it'll be focussed on enabling large nuclear, which makes sense if HMG is going to be active in nuclear. What is needed is a micro lane to speed up process and that SMRs are not unnecessarily slowed down because of HMG focus on large nuclear.

GJ – Other SMRs on the market perhaps fit larger project due to size and timelines involved in site build, need for Micro regs

MR – There is a need for industrial cheerleaders, backing Micro Nuclear as a solution for their businesses on a long-term basis. At that point, it would be possible to go to GBN and point to the importance of a micro lane being created by the relevant government agencies.

VC – How can MPs help create opportunity for Micro nuclear?

MB – There is a need to look to de-risk and gain clarity in two areas:

1. Siting and planning policy
2. Looking to become more vocal and active in UK



MR – Getting out with a roadshow in 2023, would appreciate support from APPG on that.

Meeting closed at 13:30