



Building Small Modular Reactors at Trawsfynydd: Our Business Proposition

April 2023

Table of Contents

Executive summary	3
Introduction.....	5
SECTION 1: THE OPPORTUNITY	
Background.....	6
Vision for Cwmni Egino.....	7
Policy Context.....	8
The opportunity at Trawsfynydd	10
SECTION 2: DELIVERING THE PROJECT	
Project Development Approach.....	12
Phase 1 outcomes	13
1. Social value.....	13
2. Land.....	16
3. Site Options.....	17
4. Cooling Options.....	18
5. Grid Connection.....	19
6. Planning and Consents.....	20
7. Potential Technology Solutions	22
8. Target Operating Model (TOM).....	24
9. Delivery Strategy for Development to FID (Phases 2 & 3)	27
10. Funding.....	28
11. Risks	29
Conclusion.....	33
Glossary.....	35
APPENDICES	
Appendix 1: Social value emerging outcomes and Strategy	36
Appendix 2: Siting Options.....	37
Appendix 3: Participants in Market Engagement.....	40
Appendix 4: Target Operating Model.....	42
Appendix 5: Key requirements for FID	44
Appendix 6: Work Breakdown Structure for Development to FID.....	46
Appendix 7: Milestones to FID	47

Executive summary

Cwmni Eginio was established in 2021 by Welsh Government (WG) to deliver a Site Development Programme for Trawsfynydd, focused on socio-economic growth.

Cwmni Eginio has identified the development of Small Modular Reactors (SMR) as the most credible near-medium term option to deliver this objective and is focused on enabling Trawsfynydd to be the first site in the UK to deploy SMRs.

Deploying SMRs at Trawsfynydd would make a significant early contribution to increased energy security and to meeting net zero targets for the UK and Wales, as well as create high quality jobs and growth regionally and nationally. This is aligned with key policies and priorities of both the UK and Welsh Governments.

Deployment of SMR at Trawsfynydd could create over 400 long-term jobs in the local area and over £600m GVA for North West Wales and £1.3bn GVA for the whole of Wales during an operational life of 60 years.¹ It would also create thousands of additional jobs during the construction stage, as well as through the Welsh and UK supply chains. In addition to the direct socio-economic impacts, the project could deliver and influence significant additional social value to support the long-term resilience and sustainability of local communities.

Trawsfynydd is strongly placed to be the first site in UK to deploy SMRs as a former nuclear site in public ownership with a supportive local community and skilled local workforce. Work completed to date confirms that Trawsfynydd can be one of the projects ready for approval by the UK Government in the next Parliament. Cwmni Eginio provides a development vehicle to drive this forward.

Early development work by Cwmni Eginio provides evidence of the viability of deploying SMR at Trawsfynydd and confirms:

- **the suitability of land within NDA ownership for a range of SMR technologies, generating up to 1GW of new capacity** – a Memorandum of Understanding with the NDA has been established to support the assessment and development of Trawsfynydd as a site suitable for deploying SMR;
- **the maximum electrical capacity which could be supported by direct cooling (using water from Llyn Trawsfynydd) is likely to be in the range of 500-600MWe** – indirect cooling (either wet, evaporative cooling, air cooling or a hybrid solution of both) for options with an installed capacity or power output above and requiring indirect cooling will continue to be considered in the next phase of development;
- **an application by Cwmni Eginio to National Grid ESO for a Grid Connection Agreement of approximately 1GW has been submitted and a formal offer is due shortly** – this is expected to detail the date when the connection will be available, the technical requirements that need to be met and any costs directly attributable to the project;

¹ Trawsfynydd Economic Assessment (and supporting assessment workbooks) Arup, Nov 2020 (unpublished)

- **there is significant interest by technology providers in deployment of SMR at Trawsfynydd** – Cwmni Eginio has conducted its own Market Engagement and will work closely with GBN during 2023 to confirm the technology solution that best suits Trawsfynydd within the overall selection process for the UK programme;
- **in terms of the Target Operating Model (TOM) Cwmni Eginio can adapt its role to meet the needs of the sponsor (DESNZ/GBN) and the market** – it is assumed that DESNZ/GBN would be the sponsor for the development of Trawsfynydd, therefore Cwmni Eginio has considered options for its own role rather than proposing a specific solution and will work with GBN to confirm the TOM for Trawsfynydd and their respective roles during 2023;
- **the work programme and estimated costs required to deliver the outcomes required for approval to proceed with construction** - the duration is around 5 years and therefore Trawsfynydd could meet the UK Government’s aim of approving at least two projects in the next parliament;
- potential **risks, impacts and mitigations** for the project.

To unlock this opportunity, Cwmni Eginio needs clear sponsorship by the UK Government for SMR to be developed at Trawsfynydd and to provide access to development funding. The creation of Great British Nuclear (GBN) is hugely important in this regard and it is vital it builds the capability rapidly to assume its sponsorship role.

To be ready for approval in the next Parliament, Cwmni Eginio needs **by the end of 2023**:

- a) confirmation that DESNZ/ GBN wishes to proceed with development of Trawsfynydd as one of the projects planned for approval in the next Parliament;
- b) confirmation that DESNZ/ GBN will act as the sponsor for the project, either on its own or in partnership with WG;
- c) confirmation of the technology for Trawsfynydd; and
- d) funding to meet the development cost to FID, estimated to be £250m.

To complement its Business Proposition, Cwmni Eginio has prepared the content of an Outline Business Case (OBC) to support the sponsor in making a request for funding required to complete the development phase of the project to enable a decision to construct a new nuclear power station at Trawsfynydd to be taken.

Introduction

Cwmni Eginio is proposing to develop a Small Modular Reactor (SMR) project at the site of the former power station in Trawsfynydd. This proposition is founded on Cwmni Eginio's core purpose of delivering socio-economic growth locally, regionally and nationally, as well as the urgent need for low carbon electricity to meet increasing demand, achieve net zero emissions of carbon, and increase energy security.

Over the past 12 months, the company has undertaken significant work to test the viability of deploying SMR technology at the site and assess whether the core components required to develop and deliver a successful project exist.

Based on progress to date, SMR deployment at Trawsfynydd offers a realistic opportunity to deliver socio-economic benefits in South Gwynedd and beyond, increase UK energy security and reduce carbon emissions. Cwmni Eginio has developed the programme of work required to reach a Final Investment Decision (FID) and is ready to take the project to the next phase of development.

The purpose of this document is to set out Cwmni Eginio's vision and business proposition in more detail and provide evidence and findings from the first phase of project development to demonstrate that the opportunity for SMR deployment at Trawsfynydd can, and should, be exploited.

Section 1 provides the background and policy context and outlines Cwmni Eginio's vision and the opportunity presented at Trawsfynydd. Section 2 summarises the main activities and findings of Cwmni Eginio's first phase of development. These relate to key areas including social value opportunities, site and cooling options, Grid connection, planning and consents, technology solutions, target operating model, and how the programme can be delivered and funded. Information contained in the Appendices provide further supporting information. The document is based on information available as at the end of April 2023.

SECTION 1: THE OPPORTUNITY

Background

In August 2020, the Welsh Government (WG) approved £2.5m for the Trawsfynydd Site Development Programme (TSDP) in support of the Snowdonia Enterprise Zone (SEZ) strategy, and the creation of Cwmni Eginio. The purpose of the TSDP is to:

Create sustainable job opportunities and promote economic and social regeneration by working collaboratively to drive future development at the former nuclear power station site in Trawsfynydd.

SEZ carried out extensive studies and options appraisals and confirmed the following projects offer the greatest potential:

- Advanced Nuclear Technology – deploying new generation small/advanced nuclear reactors (SMR/AMR) to generate low carbon energy; and
- Medical Research Reactors (MRR) – developing a medical research reactor to produce radioisotopes for cancer diagnostics, treatment and research.

Cwmni Eginio was established as a standalone company by WG in 2021 to deliver the TSDP. It currently has funding until March 2024 to develop a project for Trawsfynydd that achieves the objective of the TSDP.

The Office for Science within WG is undertaking a technical feasibility study of a MRR in Wales. Further consideration of this option will be given following the feasibility work and clarity on the policy framework for MRR. Cwmni Eginio is therefore focussing on SMR as the most viable option to generate socio-economic growth at Trawsfynydd in the near term.

Vision for Cwmni Eginio

Cwmni Eginio can capitalise on the increasing policy imperatives for new nuclear to deliver its purpose of socio-economic regeneration at Trawsfynydd. To achieve this, and in line with one of the projects identified by SEZ, Cwmni Eginio is proposing to deploy the first SMR in the UK at Trawsfynydd.

Our vision is:

Trawsfynydd will be the site of the first SMR under construction in the UK; North Wales will be recognised as a centre of excellence for low carbon energy; and people's quality of life will be improved.

Construction could start as early as 2027, meeting the primary purpose of socio-economic regeneration which can start during the construction phase and continue through the following decades during operation and subsequent decommissioning.

Cwmni Eginio is uniquely placed to drive delivery of a new, smaller scale nuclear power plant at Trawsfynydd through its established relationships with critical stakeholders, its focus on delivering social value and its sponsorship and ownership by Welsh Government.

Policy Context

The Prime Minister's Ten Point Plan for a Green Industrial Revolution² policy paper published in November 2020, the Energy White Paper³ published in December 2020, and the UK Government's Net Zero Strategy: Build Back Greener⁴ published in October 2021 highlight the critical role of new nuclear in the UK's future energy portfolio. This was reinforced in the British Energy Security Strategy⁵ published by the UK Government on 7th April 2022 which set a target for new nuclear of 24 Gigawatts (GW) by 2050 to help deliver energy security and net zero. The British Energy Security Strategy was welcomed by WG in a written statement by the Minister for Climate Change on the 8th April 2022.⁶

The British Energy Security Strategy stated an intention to establish Great British Nuclear (GBN) to support the development of new nuclear and help ensure a pipeline of projects⁶. Its launch was confirmed in the Spring Budget 2023 announcement and Powering Up Britain: Energy Security Plan⁷ published on 30th March 2023.

GBN's first activity is to run a selection process to identify the SMR technologies best suited for the UK nuclear programme. This process commenced on 19th April 2023 with market engagement to gather intelligence from technology suppliers. This will be followed by a down selection process planned to be completed in Autumn 2023. GBN is also expected to work on access to potential sites for new nuclear projects to achieve the UK Government's long-term ambition of 24GW of nuclear power by 2050. The Department for Energy Security and Net Zero (DESNZ) is developing a new nuclear National Policy Statement (NPS) to cover the siting and policy framework for nuclear electricity generation infrastructure beyond 2025, which is expected to be designated in early 2025.⁸

The UK Government has stated its intention to approve one additional GW scale project in the current Parliament. It announced on 29th November 2022⁹ that it had acquired a 50% shareholding in Sizewell C alongside EDF and confirmed its commitment to invest up to £700m of direct Government funding¹⁰. It has legislated for a new regulated asset based (RAB) financing model that is intended to be used for financing the construction of Sizewell C.

The UK Government has also stated its intention to approve at least 2 additional projects in the next Parliament, including SMRs¹¹.

² [The ten point plan for a green industrial revolution - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/ten-point-plan)

³ [Energy white paper: Powering our net zero future - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/energy-white-paper)

⁴ [net-zero-strategy-beis.pdf \(publishing.service.gov.uk\)](https://www.gov.uk/government/publications/net-zero-strategy-beis.pdf)

⁵ <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

⁶ <https://gov.wales/written-statement-uk-energy-security-strategy>

⁷ [Powering Up Britain: Energy Security Plan \(publishing.service.gov.uk\)](https://www.gov.uk/government/publications/powering-up-britain-energy-security-plan)

⁸ [Powering Up Britain: Energy Security Plan \(publishing.service.gov.uk\)](https://www.gov.uk/government/publications/powering-up-britain-energy-security-plan)

⁹ [UK government takes major steps forward to secure Britain's energy independence - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/uk-government-takes-major-steps-forward-to-secure-britain-s-energy-independence)

¹⁰ [Nuclear Energy \(Financing\) Bill \(parliament.uk\)](https://www.parliament.uk/bills/2022-23/nuclear-energy-financing)

¹¹ [Powering Up Britain: Energy Security Plan \(publishing.service.gov.uk\)](https://www.gov.uk/government/publications/powering-up-britain-energy-security-plan)

DESNZ has committed match funding of up to £210m to support the development of UK SMR¹² and launched the Future Nuclear Enabling Fund (FNEF) of up to £120m to address barriers to entry. Grants cover the period April 2023 to March 2025 and must be matched by private sector investment. Awards are expected to be confirmed in 2023.

WG's broad policy commitment to nuclear is noted in Net Zero Wales Carbon Budget 2 (2021-25)¹³ and Future Wales – the National Plan 2040¹⁴. Trawsfynydd is specifically referenced in Future Wales as a potential site for SMR with necessary infrastructure and local skills already in place. The Plan noted the potential for new nuclear developments to act as a catalyst for regional economic development and high value job creation. There is also a presumption for small nuclear development in a Welsh planning policy context (national and regional).

Snowdonia was one of seven Enterprise Zones established by the WG in 2012 to promote economic growth, with the Trawsfynydd site included within the Snowdonia Enterprise Zone (SEZ). One of the strategic objectives for the site was to “promote the site both in the UK and internationally as the location of choice for the first Small Modular Reactor (SMR) and advanced nuclear development in the UK.”¹⁵

The establishment of Cwmni Eginio to take forward the work of the SEZ was announced in September 2020¹⁶, which demonstrated WG's commitment to capturing the economic opportunity presented by nuclear deployment at Trawsfynydd. The company was formed in full alignment with the Well-being of Future Generations Act's¹⁷ seven well-being goals and five ways of working.

Trawsfynydd is also a project within the North Wales Growth Deal (NWGD) led by Ambition North Wales with an indicative £20m allocated for the development phase. Ambition North Wales note the significant number of new jobs – as well as low carbon energy generation from SMR technology that has significant potential for deployment across the UK and internationally.

¹² [UK backs new small nuclear technology with £210 million - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/uk-backs-new-small-nuclear-technology-with-210-million)

¹³ [Second All Wales Low Carbon Delivery Plan \(2021-2025\) \(gov.wales\)](https://gov.wales/second-all-wales-low-carbon-delivery-plan-2021-2025)

¹⁴ [Update to Future Wales - The National Plan 2040 \(gov.wales\)](https://gov.wales/update-to-future-wales-the-national-plan-2040)

¹⁵ [Snowdonia Enterprise Zone Strategic Plan 2018 – 2021 \(gov.wales\)](https://gov.wales/snowdonia-enterprise-zone-strategic-plan-2018-2021)

¹⁶ [Future potential of Trawsfynydd site strengthened | GOV.WALES](https://gov.wales/future-potential-of-trawsfynydd-site-strengthened)

¹⁷ [Well-being of Future Generations \(Wales\) Act 2015 | GOV.WALES](https://gov.wales/well-being-of-future-generations-wales-act-2015)

The opportunity at Trawsfynydd

Trawsfynydd is an attractive site for SMR development.

Trawsfynydd is an existing nuclear site under the ownership of Nuclear Decommissioning Authority (NDA) with access to essential infrastructure, including connection to National Grid. The site is ideally suited to spearhead a programme of SMR and provide a model for UK-wide deployment.

An initial study carried out by Ove Arup and Partners Ltd. (Arup) confirmed that Trawsfynydd is suitable for the deployment of a range of SMR technologies. As an inland site it also provides a pathway to other possible inland SMR developments – expanding the range of UK sites that could host nuclear generation.

Due to the on-going decommissioning programme, there is a large existing workforce on site and in the local supply chain with relevant skills who can help deliver SMR.

Deploying SMRs at Trawsfynydd would make a significant early contribution to increased energy security and to meeting net zero targets for the UK and Wales.

Developing SMRs at Trawsfynydd will boost economic growth in North Wales and across the UK, supporting high value, high skilled jobs.

SMR development in Trawsfynydd would unlock significant private sector investment, creating hundreds of high value, high skilled jobs which would boost economic growth in North Wales and across the UK. It would also create thousands of additional jobs during the construction stage. As well as provide employment for people locally, the project could have a positive socio-economic impact through attracting talent back to the region and creating wider business opportunities.

In addition, there are wider economic benefits of a Wales and UK-based supply chain in terms of jobs and growth, particularly if SMRs were deployed as a programme and manufactured for export.

The Further and Higher Education (FE/HE) provision and facilities at Grŵp Llandrillo Menai and Bangor University present an excellent opportunity for skills development within the region, and the maximisation of job opportunities for the local and regional workforce. This would help retain talent within the region and reverse the trend towards outward migration, supporting the social, economic and cultural well-being of local communities.

Well-established associated academic and industrial research facilities located in the region (e.g., Nuclear Futures Institute and M-Sparc at Bangor University, AMRC Cymru in Deeside) could provide opportunities to build on current R&D capabilities and increase the domestic and export potential of the Welsh nuclear sector.

Kick starting the SMR programme at Trawsfynydd will enable a nuclear sector renaissance in the UK.

Trawsfynydd offers the earliest credible opportunity to demonstrate the viability of SMR that can help drive a long-term programme of nuclear projects in the UK. Cwmni Egino's strategic role in early-stage development of the site has created the opportunity to accelerate development and meet the Government's objective of approving two nuclear projects in the next Parliament.

Currently, the nuclear sector contributes £6.2bn in GVA to the UK economy and provides 65,000 direct jobs. The UK's civil nuclear industry contributed £700m to the Welsh economy in 2021 - directly employing 800 people and supporting a total of 10,700 jobs across the country.¹⁸ The Nuclear Industry Association (NIA) estimates the value of a thriving nuclear sector could be worth £33bn in GVA to the UK economy by 2050 and provide well over 300,000 job opportunities – greater than the entire UK electricity and gas industry today.¹⁹ This includes a multi-billion pound SMR export opportunity.

SMRs will be critical to unlocking this value, bridging the technology gap between existing, large-scale nuclear projects like Hinkley Point C and Sizewell C, and future nuclear technologies, such as Advanced Modular Reactors and fusion. It will also ensure the UK maintains and grows the existing nuclear skills base and supply chain which will be needed in future.

Accelerating the deployment of an SMR programme would position the UK as a global leader in advanced nuclear technology manufacturing and create significant UK export opportunities internationally. By providing a repeatable framework for SMR development, Trawsfynydd can act as a model for rolling out SMR at scale – multiplying the economic, social, and environmental benefits. It would establish North Wales and the UK as a globally recognised centre of excellence for low carbon energy manufacturing and innovation and further connect the Welsh and UK nuclear supply chains, especially through the North West Nuclear Arc (NWWNA).

¹⁸ Nuclear Industry Association (January 2023), ['Delivering Value: The Economic Impact of the Civil Nuclear Industry'](#)

¹⁹ Nuclear Industry Association (March 2022), ['Submission to the Economic Affairs Committee Inquiry into UK Energy Supply and Investment'](#)

SECTION 2: DELIVERING THE PROJECT

Project Development Approach

Cwmni Eginio has adopted a 3 Phase approach to the development of a project, leading to a Final Investment Decision (FID) at the end of Phase 3.

- Phase 1:** Confirming the business proposition for Trawsfynydd and work programme to FID.
- Phase 2:** Further project development, including site characterisation, environmental studies, engineering development, socio-economic development plan, organisational development and preparation of consents and licence applications.
- Phase 3:** Submit the permit applications, procure key contracts, preliminary site enabling works, secure the financing for construction, final business case.

The following sections describe the outcome of the work carried out during Phase 1, aimed at assessing the opportunity for deploying small scale nuclear at Trawsfynydd.

Phase 1 outcomes

1. Social value

Cwmni Eginio aspires to maximise the potential benefits of the project for local communities, as well as the wider region – to create social value.

Development of SMR at Trawsfynydd would be a multi-billion pound investment and one of the single largest infrastructure projects in Wales for decades. It would attract direct and indirect employment as well as major additional socio-economic benefits and social value.

There will be inherent value to society that occurs because of the delivery of the project itself - social benefits such as job creation, energy resilience, energy generation, innovation, and revenue generation.

Deployment of SMR at Trawsfynydd could create over 400 long-term jobs in the local area and over £600m GVA for North West Wales and £1.3bn GVA for the whole of Wales during over an operational life of 60 years.²⁰ It would also create thousands of additional jobs during the construction stage, as well as through the Welsh and UK supply chains.

The planning and preparation of workforce pipelines for SMR at Trawsfynydd will enable optimal regional socio-economic benefit and reduce project risk. Early skills mapping based on workforce planning for a large-scale nuclear new builds demonstrates the wide range of transferable skills required to deploy SMR at Trawsfynydd.²¹ There are significant overlaps in the opportunities to grow regional talent to support a nuclear build and those required for other industries, including Net Zero technologies.

The need to focus on a local talent pool with transferable skills and competencies aligns with regional sector skills strategies for construction and energy which will be formulated based on a range of key infrastructure projects across Wales in line with the Welsh Government Net Zero Skills Action Plan.²²

The direct socio-economic impacts of delivering the project would be far-reaching and long-term, and would significantly support the resilience and sustainability of local communities. Cwmni Eginio also has an opportunity to deliver and influence additional social value at three levels:

- **directly** – through what, when, how, and who delivers the project and site;
- **indirectly** – through the supply chain; and
- **in the wider community** – through influencing, partnering, supporting and investing.

²⁰ Trawsfynydd Economic Assessment (and supporting assessment workbooks) Arup, Nov 2020 (unpublished)

²¹ Nuclear Workforce Skills Mapping, produced by National College of Nuclear in support of Cyngor Gwynedd, April 2023 (unpublished)

²² [Net zero skills action plan | GOV.WALES](#)

Cwmni Eginio is developing a Social Value Strategy aimed at better understanding the characteristics and needs of local communities and explore the ways the project can support improved quality of life for those communities. The Strategy will provide the foundations for a Social Value Delivery Plan which will include clear initiatives and activities aligned to the Strategy's priority outcomes and set up a measurement framework.

The development of the Strategy to date indicates a significant opportunity for new nuclear development at Trawsfynydd to deliver social value. Preliminary engagement with local stakeholders has ascertained the importance of ensuring maximum social value from the proposed development at Trawsfynydd, as well as support for Cwmni Eginio's approach. Furthermore, Market Engagement has confirmed the commitment of potential future partners (including technology providers) to maximise social value through their respective roles.

A Local Needs Analysis (LNA) was completed to analyse the baseline socio-economic context at the local, regional and national (Wales) scale, drawing on available data and policy/strategy. Based on the findings of the LNA, a number of potential themes have been identified, which represent opportunity areas for Cwmni Eginio to influence social value outcomes. The eight themes identified are: Employment & Training; Inward Investment & Research; Health & Wellbeing; Community Education & Outreach; Housing & Regeneration; Environment & Recreation; Transport & Connectivity and Welsh Language & Culture.

Within these themes, a number of outcomes have been identified which set out Cwmni Eginio's goals for social value activities at a high level.²³ These include:

- Increase in economic activity and spending in the local economy;
- Increase in the retention of young and local talent through education and training;
- Increase in the skills of the local workforce to work in low carbon and related sectors;
- Reduction in unemployment, underemployment and in-work poverty;
- Increase in households' access to reliable, affordable and sustainable electricity;
- Reduction of car dependency and increased access to public transport and active travel modes;
- Minimised/mitigated negative impacts of construction and operation on existing assets and quality of life;
- Improved vitality of local towns, villages and high streets;
- Enhancement of the Welsh language and culture;
- Improvements to the visual landscape and natural environment;
- Improved availability of recreational activities, including enhanced access to the cultural and natural environment;

²³ Emerging outcomes have been mapped to a prioritisation matrix of Cwmni Eginio's influence (based on identified potential levers available throughout the project lifecycle) vs the performance of socio-economic indicators compared to the rest of Wales. They have been assigned to the eight Social Value Themes as well as a geographical scope, with a proposed high-level strategy for each quadrant of the matrix. Some outcomes are longer term and could be considered long-term impacts. For these, sub-outcomes which are more specific to Cwmni Eginio have been developed. A summary can be found in Appendix 1.

- Increased engagement and involvement of local communities in shaping their socio-economic future;
- Enhancement of local communities' long-term health & well-being;
- Promotion of cross-sector collaboration and partnership working; and
- Increase in social inclusion through supporting the third sector and existing grassroots networks.

Ongoing stakeholder engagement with community representatives over the coming months will further inform Cwmni Egino's Social Value Strategy by testing and exploring the emerging social value themes, opportunities and outcomes identified. As the Strategy evolves, Cwmni Egino will be taking a co-productive approach to maximise the opportunity for stakeholder and citizen involvement in the design and delivery of Cwmni Egino's social value initiatives. Not only will this ensure that the Strategy aligns with the needs and aspirations of those it aims to benefit, it will also bring additional focus to help prioritise resources and effort in areas that will generate the greatest social impact.

2. Land

The land considered to date lies within ownership of the NDA. The NDA has confirmed there are no secured tenancies on this land. Cwmni Eginio may need to acquire additional land, including for temporary works during construction and this will be assessed during the detailed development stage.

Cwmni Eginio and NDA signed a Memorandum of Understanding (MoU) in October 2022. The purpose of the MoU is to support the assessment and development of Trawsfynydd as a site suitable for deploying SMR. The scope covers 6 areas:

- a. Data, Information and Knowledge relating to the site;
- b. Site operations;
- c. Programme alignment between SMR and decommissioning;
- d. Socio-economic activities;
- e. Stakeholder management and communications; and
- f. Requirements for land and other site assets.

At this stage, Cwmni Eginio is assuming that land within NDA ownership required for SMR development can be acquired, either as freehold or on long term lease, and that the cost will be charged to the project at, or after a FID.

3. Site Options

An initial land assessment study identified three plots of land within the NDA's ownership that could be suitable for deployment of SMR (see Appendix 2). These plots in the vicinity of the current site with appropriate access to Llyn Trawsfynydd for cooling needs and the National Grid sub-station.

An initial enveloping study based on publicly available information confirmed that a range of SMR technologies could be deployed at Trawsfynydd.

Initial topographical assessment of the three plots confirmed the area within each plot that could be readily deployed, taking account of the need to optimise the balance of cut and fill to establish the required platform height for the power station. This is summarised in Appendix 2.

Based on this assessment and feedback from technology suppliers through Market Engagement (Section 7), **there is the potential to deploy up to 1GW of new capacity within the NDA land. This will be confirmed as part of detailed site characterisation, site layout optimisation and construction planning studies in Phase 2.**

Further work is required to assess the relative merits of each plot and confirm the preferred location for the power station. Key considerations include:

- Access to site;
- Visual impact;
- Environmental impact, including proximity to protected sites;
- Ground conditions;
- Access to utilities (water, drainage, power etc); and
- Extent and complexity of ground preparation works required.

4. Cooling Options

Technical studies have been undertaken to consider the potential impact of cooling for a new power plant on Llyn Trawsfynydd. A study undertaken by Arup in 2020 used historical data to build a simple model to assess the impacts of a range of cooling options (direct, wet indirect and dry) for SMR deployment on surface water temperatures of Llyn Trawsfynydd and operation of Maentwrog hydropower station.²⁴

Further work has been undertaken during Phase 1 to develop the model and to assess information provided by technology providers during Market Engagement. **This latest assessment confirms that the maximum electrical capacity which could be supported by direct cooling (using water from Llyn Trawsfynydd) is likely to be in the range of 500-600MWe.** Therefore, options with an installed capacity or power output above this would require indirect cooling – either wet, evaporative cooling, air cooling or a hybrid solution of both.

The use of indirect systems will require additional land and may increase the visual impact. Evaporative cooling solutions are likely to include measures to limit plume formation during periods of high ambient humidity.

The cooling system design for Trawsfynydd will be confirmed in Phase 2 once the SMR technology has been selected and further, more detailed studies have been concluded. The key considerations include:

- Maintaining the level of the lake within regulatory limits and relevant impact on Maentwrog operations;
- Thermal dispersion within the lake to ensure effective thermal mixing;
- Environmental impact and regulatory categorisation of the lake (particularly in respect of its ecological status);
- Impact on output power; and
- Land requirements, particularly for indirect cooling solutions.

²⁴ Maentwrog is a hydropower generation plant used primarily to control the water level in Llyn Trawsfynydd. The water level is determined by the flow into the lake, evaporative losses and flow through Maentwrog.

5. Grid Connection

A Grid Connection Agreement (GCA) is a critical requirement for the project both to ensure the power plant can be connected and to confirm the date when the connection will be available.

There are capacity constraints on the high voltage network due to the high number of developers seeking to connect generation plants. Cwmni Eginio procured a study to assess the feasibility of securing a GCA for Trawsfynydd to match the target schedule for development of SMR. The study confirmed that, based on current data for existing and contracted new capacity, capacity in the North Wales loop including Trawsfynydd (National Grid boundary areas NW1, NW2 and NW3), is heavily constrained, taking into account the plan to upgrade the single 400kV circuit between Pentir and Trawsfynydd substations to a double circuit.

To mitigate the risk to development at Trawsfynydd and secure the earliest connection date, **Cwmni Eginio submitted an application to National Grid ESO for a grid connection agreement of approximately 1GW**. A formal offer is due (current estimates of offer date from NGENSO is 20th May 2023) and is expected to detail the date when the connection will be available, the technical requirements that need to be met and any costs attributable to the project directly.

6. Planning and Consents

Cwmni Eginio has identified that the permissions needed to enable the construction and operation of a SMR at Trawsfynydd will include:

- Land use planning consent(s), including Development of National Significance (DNS) or Development Consent Order (DCO), depending on the installed capacity of the reactor(s)
- Environmental permits:
 - Non-nuclear, such as water discharge
 - Radioactive Substances Regulation (RSR) in accordance with The Environmental Permitting (England and Wales) Regulations 2016 (EPR16) (as amended)
- Nuclear Site Licence
- Approved Funded Decommissioning Programme
- Regulatory Justification for the technology proposed to be deployed
- Generation licence

Relevant regulatory and policy contexts include:

- **National Policy Statements (NPS):** in particular EN1 and EN6²⁵ relating to nuclear specifically. EN6 names sites suitable for development of GW scale reactors. Trawsfynydd is not one of the sites named as it was not considered at the time to be suitable for GW scale development. EN6 is being updated and/or superseded with a new policy statement that is expected to include SMR. It is understood the new NPS will be designated in 2025 which is before any consent application for Trawsfynydd will be ready for submission.
- **Land Use planning framework:** planning consent applications for power plants with a generation capacity below 350MWe would be considered as a DNS for approval by Welsh Government; planning applications for power plants with a capacity above 350MWe would be subject to the DCO process aligned to the Planning Act 2008 and approved by the UK Secretary of State for Energy Security and Net Zero.
- **Local Development Plans (LDP):** The planning authority for Trawsfynydd is Snowdonia National Park Authority (SNPA). The current LDP recognises the Enterprise Zone status at Trawsfynydd and ambitions for low carbon generation, whilst also setting out the need for a Masterplan for any new development at the site. The LDP is currently under review and the updated plan is expected to be adopted in 2027 Cwmni Eginio will engage with the SNPA policy team to seek inclusion of SMR development at Trawsfynydd within the revised LDP.
- **Generic Design Assessment (GDA):** provides an assessment of the technology from a safety, security and environmental perspective with the aim of reducing the risk of the future licencing process. GDA is not a permit and it is not a requirement to complete

²⁵https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47859/2009-nps-for-nuclear-volumel.pdf

GDA. Cwmni Eginio will work with the selected technology partner to confirm the overall licensing strategy for the site, in particular the Environmental Permit.

- **Environmental Permit for Radioactive Substances Regulations (RSR) and the Site-Specific Pre-Construction Safety Report (SSPCSR)**
- **Environmental permitting:** there are many permits required that are inter-related. It is important to consult with Natural Resources Wales (NRW) on the permitting regime early in the permitting process to define the scope and key requirements.
- **Habitats Regulations Assessment (HRA):** designated sites have been identified and a preliminary habitat survey has identified opportunities and constraints that may apply.
- **Levelling Up and Regeneration Bill (LURB) & Environmental Impact Assessment:** Part 6 of the LURB provides the legislative foundations for a new environmental assessment regime for the UK, moving to an outcomes-based approach relating to environmental protection. This will include utilising a new framework for considering the impact on the environment which is likely to be phased in over the next two years.

Although the current NPS EN 6 does not designate Trawsfynydd as a specific site for new nuclear, the overarching NPS for energy (EN1) together with the British Energy Security Strategy provides a strong basis for presumption in favour of development. Furthermore, the new nuclear NPS is planned to be designated in 2025 that is expected to provide specific policy basis for planning purposes. The detailed consenting and licensing plan will be integrated with the programmes of site characterisation and environmental studies in Phase 2 of the development.

7. Potential Technology Solutions

Cwmni Eginio undertook Market Engagement to understand the potential solutions available that could deliver its vision and support the proposition for Trawsfynydd. There were four themes:

- **Technology:** key features and readiness;
- **Target Operating Model:** roles in the project that market participants are offering to undertake;
- **Social Value:** specific opportunities to deliver social value to support Cwmni Eginio's social value strategy; and
- **Funding:** both for own technology development and for project (Trawsfynydd specific) development.

The design of the Market Engagement process recognised that DESNZ had announced its intention to undertake a technology selection process in 2023.²⁶ Therefore, it was structured as a request for information to inform the proposition for Trawsfynydd, and not for the purposes of technology selection.

Market Engagement was launched in July 2022 through the Nuclear Industry Association (NIA) [website](#), requesting Expressions of Interest. The Market Engagement Information Pack and Questionnaire were issued to 19 companies in September 2022. Cwmni Eginio held a briefing session with all participants followed by one-to-one meetings with each company to support their questionnaire responses. 12 responses were received in November 2022.

A summary of the broad features of the technologies considered through Market Engagement is given in Appendix 3.

The key conclusions drawn from market engagement are:

1. A number of technologies could be deployed at Trawsfynydd and enable Cwmni Eginio to deliver its vision and be ready to start construction in 2027.
2. All of the technologies are new and none of the providers has a reference plant. Therefore, it will be necessary to undertake significant technical due diligence during the future development phase to understand technical risk and mitigation.
3. It is important to ensure a common understanding of the meaning of roles within the Target Operating Model for the project. Market engagement revealed differences between market participants in this regard. (This is discussed further below in Section 8.)
4. All the technology options can provide social value. Most of the value locally arises from project activity and is not strongly dependent on the technology. There may be significant differences between technologies at a national level arising from the manufacturing and supply chain strategies in each case. This has not been considered in detail by Cwmni Eginio.
5. Private sector funding is focused on technology development. Opportunities for private sector investment in project development (as distinct from technology development) are

²⁶ <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

limited and dependent on a clear commitment by the UK Government that the project will go ahead.

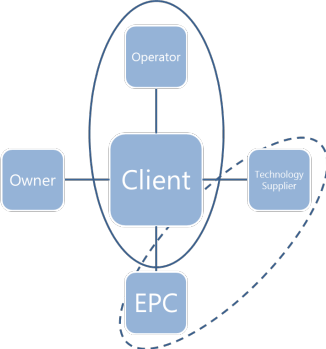
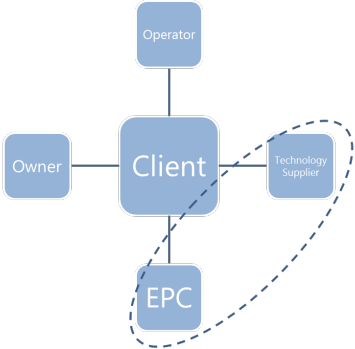
GBN has launched its SMR technology selection process and is currently undertaking market engagement. **Cwmni Eginio will work closely with GBN during 2023 to confirm the technology solution that best suits Trawsfynydd within the overall selection process for the UK programme.**

8. Target Operating Model (TOM)

The TOM defines the roles that need to be performed to deliver the project and who will undertake them. This in turn determines the organisational design of Cwmni Eginio. The final design of the TOM will be impacted by the role of Great British Nuclear (GBN) which is evolving. For the purposes of this business proposition, **Cwmni Eginio has assumed that DESNZ/GBN would be the sponsor for the development of Trawsfynydd and has considered options for its own role rather than proposing a specific solution.**

In developing the TOM options, Cwmni Eginio sought feedback from the market, using the Infrastructure and Projects Authority (IPA) model as a framework. One objective was to seek a common understanding of the definition of the roles. The definitions of the principal roles are summarised in Appendix 4.

Two organisational design options have been considered:

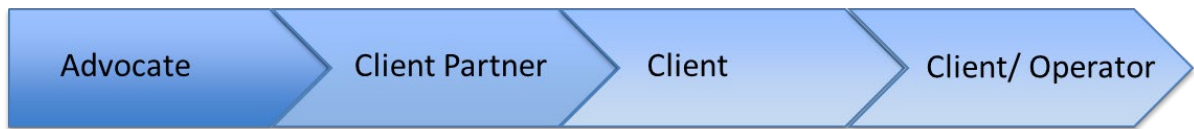
<p>Option 1</p> <p>Client and Operator combined in a single organisation (Horizon/HPC and SZC model)</p>	<p>Option 2</p> <p>Client and Operator in separate organisations</p>
	

N.B. Technology Partner & Engineering Procurement and Construction (EPC) could be a single organisation with one interface with owner or separate with multiple interfaces with owner (HPC & SZC model).

Consideration of the Options

Cwmni Eginio's role

Cwmni Eginio can adapt to meet the needs of the sponsor (DESNZ/GBN) and the market. Its role could range from advocate through client to client/operator:



- | | | | |
|---|---|---|---|
| <ul style="list-style-type: none"> • Promote the project • Secure 3rd parties to lead development • Advocate for local support • No shareholding in development phase | <ul style="list-style-type: none"> • Promote the project • Lead initial development • Secure 3rd party(ies) to lead development • Partner in development, focusing on local support and social value • Transition to minority shareholding for development phase | <ul style="list-style-type: none"> • Promote the project • Lead developer and owner in development phase • Focus on owner responsibilities only • Secure operating partner to provide technical input and licensing capability • Likely to maintain majority shareholding in development phase | <ul style="list-style-type: none"> • Promote the project • Lead developer and owner in development phase • Build capability to become owner/ operator and nuclear site licensee • Likely to maintain majority shareholding in development phase |
|---|---|---|---|

In assessing the options, the primary considerations were:

1. Who is the client?, and
2. Who is the operator (and nuclear site licensee)?

Client

Apart from EDF, there is currently no established client organisation in the UK capable of leading a nuclear development. It is unclear whether GBN will undertake this role itself (or procure from a third party) for individual projects or whether it will act as sponsor for project development companies.

If GBN becomes the client, Cwmni Eginio could either:

- a) be absorbed into GBN and focus on delivery of social value (Advocate role); or
- b) remain as an independent partner to GBN for Trawsfynydd (Development Partner).

If GBN is the sponsor, Cwmni Eginio will need to build its own client capability with support from GBN and the supply chain.

Cwmni Eginio will work with GBN to confirm the TOM for Trawsfynydd and their respective roles during 2023.

Operator

Currently EDF Energy Nuclear Generation Limited (ENGL) is the only operator of nuclear power stations in the UK. Hinkley Point C (HPC) and Sizewell C (SZC) are building their own operating capability, drawing technical expertise from within ENGL.

Experience from Horizon Nuclear Power demonstrated the challenge and time required to build independent operator capability from scratch. In the context of deploying a fleet of SMRs, it will be inefficient to establish independent operators/site licence companies for each individual project. Therefore, **Cwmni Eginio advocates the formation of a multi-site licensee/operator (probably through a partnership with an established nuclear operator) and proposes to focus on its Client role.**

9. Delivery Strategy for Development to FID (Phases 2 & 3)

The minimum scope of work for the development phase is defined by the requirements to achieve Final Investment Decision (FID) which are presented in Appendix 5. The Work Breakdown Structure (WBS) has been developed to Level 2 and is attached as Appendix 6.

The schedule to FID is largely determined by the duration of activities and the logic links between them. In particular, the consents and permits are complex and highly inter-related and drive much of the site engineering development programme. Therefore, it is important to manage all the workstreams as an integrated programme to control the critical path. The duration to FID depends on risk appetite to both schedule and cost as this determines whether to adopt early starts to safeguard schedule or late starts to reduce development expenditure at the front end.

The proposed programme is designed to achieve earliest approval and focuses on the essential activities required to reach FID. The proposed outline schedule is attached in Appendix 7. The end date will be driven by when Phase 2 commences.

The estimated cost to FID is £250m. This estimate includes the minimum activities required to achieve FID set out in the WBS. It excludes:

- a) Historic costs;
- b) Generic Design Assessment/ technology licensing (assumed to be met by the technology provider);
- c) Engineering development costs (assumed to be met by the technology provider);
- d) Cost of acquiring the land (permanent and temporary);
- e) Procurement of long lead items;
- f) Any site preparation or construction costs (N.B. in Option 4 site enabling works would commence before FID but the cost of these works is not included in the above estimate);
and
- g) Allowance for inflation.

Cwmni Eginio would seek to establish key strategic partnerships with GBN and the NDA to support successful delivery of the development phase. In particular, the Target Operating Model and Cwmni Eginio's role within it will need to be confirmed during 2023/24 in order to inform the organisational design and the plan for building the necessary capability.

Cwmni Eginio will procure partnerships with the supply chain to deliver specific programmes of work.

10. Funding

It is assumed that **funding for the construction phase will be underpinned by either a contract for difference or RAB licence**, supported by an appropriate Government Support Package. The target commercial structure for the project at FID will be confirmed during the development phase.

Based on feedback from market engagement, private sector investment is focused on technology development rather than site-specific project development. Therefore, **our central assumption is that the majority of the cost of development Phases 2 and 3 to FID will need to be publicly funded**. Any private sector investment will require a high degree of certainty that the project will proceed at FID, thereby transferring development risk back to the UK Government.

The main **potential sources of funding are WG, DESNZ/GBN and North Wales Growth Deal (NWGD)**. Cwmni Eginio has prepared draft content for an Outline Business Case (OBC) to support the sponsor in securing funding support.

11. Risks

Risk	Impact	Mitigation
Project sponsorship unclear	Lack of direction and commitment to the development of Trawsfynydd, leading to delay and loss of support	<ul style="list-style-type: none"> • Development of Business Proposition to highlight the benefits of the project to UKG, WG and GBN • Confirm sponsorship through formal engagement with DESNZ/GBN to secure Trawsfynydd as a named project in the UK nuclear programme
Cwmni Eginio/ Trawsfynydd not selected as one of the initial sites identified in the GBN programme for approval in the next Parliament	Inability to start detailed development of the site and achieve vision of starting construction by 2027	<ul style="list-style-type: none"> • Re-define development strategy and plan for Trawsfynydd, including other options to secure socio-economic benefits
Target Operating Model not fully defined	Roles and responsibilities of project participants unclear, impacting the ability to confirm the organisation design for Cwmni Eginio	<ul style="list-style-type: none"> • Seek early confirmation from GBN on the target operating model for UK projects • Clarify the role of Cwmni Eginio and the organisational development plan required to acquire the required capabilities
No clear strategy and plan for establishing a UK wide operator and nuclear site licence company	Unable to progress nuclear licensing, leading to a delay in achieving the conditions required for FID	<ul style="list-style-type: none"> • Early engagement with GBN to clarify the strategy and plan to establish the operator/nuclear licence • As a contingency, extend the organisational development plan for Cwmni Eginio to include operator/licensee capability

<p>Unable to secure sufficient funding for the development phase</p>	<p>Inability to complete the work required to achieve the conditions for a Final Investment Decision</p>	<ul style="list-style-type: none"> • Support the sponsor in seeking approval of an OBC for the development phase • Tight control of development scope and costs to minimise development expenditure
<p>Technology selection delayed beyond 2023</p>	<p>Progress of development work is constrained, impacting the schedule to FID and market confidence in the UK nuclear programme</p>	<ul style="list-style-type: none"> • Support and encourage GBN to confirm technology selection in 2023 • Update the development plan to mitigate the impact of the delay
<p>Site conditions constrain the scale and/or increase the cost of generation</p>	<p>Project becomes uneconomic compared with alternatives</p>	<ul style="list-style-type: none"> • Undertake site characterisation studies (topographical, geotechnical and seismic hazard) to confirm suitability and feasibility of the site
<p>Inadequate grid capacity in North Wales</p>	<p>Delay in commercial operation date, impacting the investment case and delaying the delivery of social value</p>	<ul style="list-style-type: none"> • Secure and maintain grid connection agreement to secure the earliest connection date
<p>Feasible cooling solutions constrain the scale of development and/or increase the cost of generation</p>	<p>Project becomes uneconomic compared with alternatives</p>	<ul style="list-style-type: none"> • Assess feasibility of cooling water solutions, including environmental impact to confirm the most suitable and feasible cooling solution
<p>Delays in securing relevant regulatory approval for SMR technology</p>	<p>Progress of development work is constrained, impacting the schedule to FID</p>	<ul style="list-style-type: none"> • Development schedule aligned with technology vendor's programme, with review points to minimise regulatory work • Independent assessment (by Cwmni Eginio or GBN) of progress to understand the technical risks and assess the

		impact on the viability of the project
Trawsfynydd is not one of the sites designated for nuclear deployment	The policy need for development of Trawsfynydd relies on National Policy Statement (NPS) EN1 and local development plan	<ul style="list-style-type: none"> • Support DESNZ in the renewal of NPS EN6 to cover SMRs
Unable to build and maintain sufficient support locally for development of a new nuclear power station at Trawsfynydd	Reduced advocacy for the project locally, resulting in delays to key decisions and increased resistance to the development	<ul style="list-style-type: none"> • Maintain wide and structured stakeholder engagement with decision makers, influencers and the community to explain the merits and impacts of the development
Insufficient resources available to support the development phase	Unable to maintain programme, leading to a delay and increased cost to FID	<ul style="list-style-type: none"> • Establish a robust development programme with the sponsor, aligned to a procurement plan for service provision and organisational development plan for internal capability • Promote Cwmni Eginio to build interest, confidence and commitment in the project
Delay in the design, manufacturing and supply chain capability of SMR suppliers	Unable to progress licences and permits and confirm the cost and delivery schedule for the project, leading to a delay and increased cost to FID	<ul style="list-style-type: none"> • Confirm the technology provider as early as possible and build and manage a joint programme of technology and project development
Unable to establish a credible delivery strategy to underpin investment at FID	Unable to secure funding for the construction phase and therefore FID is not taken	<ul style="list-style-type: none"> • Work with GBN and the selected technology provider to establish the delivery model for the UK programme and its application to Trawsfynydd

Unable to secure funding for the construction phase	FID is not taken	<ul style="list-style-type: none">• Adopt a staged approach to development to assess the risk of achieving FID at regular intervals
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Conclusion

Deployment of SMRs at Trawsfynydd provides the most viable route to capture significant social value locally, regionally and nationally in the near term and deliver Cwmni Eginó's vision.

It would also contribute to UK Government ambitions for 24GW of nuclear by 2050 and provide Great British Nuclear with a head start in delivering the wider UK nuclear programme.

Cwmni Eginó carried out market engagement which identified a number of technologies that could be deployed at Trawsfynydd. Cwmni Eginó has not carried out a selection process and remains technology neutral. To meet the programme objectives, the technology will need to be decided in 2023 in conjunction with the technology selection process adopted by GBN/DESNZ.

The site has the potential to accommodate up to 1GW of power generation, with three possible plots within the NDA site boundary. This will be confirmed through more detailed site investigations and construction planning in the next phase of the development. Cwmni Eginó has already submitted an application to National Grid for a connection agreement of approximately 1GW.

Llyn Trawsfynydd has the potential to support direct cooling for 500-600 MW of generation. Proposals with capacity above this range will require indirect cooling as part of the cooling system design. The cooling solution will be confirmed during the next phase of development in concert with technology selection.

Cwmni Eginó has identified options for the Target Operating Model and has illustrated how it could adapt to meet the needs of the sponsor (DESNZ/GBN) and the market. Cwmni Eginó's role could range from advocate through client to client/operator. This can be determined once the role and operating model of GBN has been clarified, enabling Cwmni Eginó to confirm its organisation design.

The capacity of the proposed development is likely to exceed 350MWe and therefore require a DCO in accordance with the Planning Act 2008. Trawsfynydd is not one of the sites designated in the extant NPS for nuclear (EN6). The update/replacement to EN6 is expected to be designated in 2025, in advance of a DCO application, and would provide the policy context.

Cwmni Eginó has developed the work programme and estimated costs required to deliver the outcomes required for approval to proceed with construction. The duration is around 5 years and therefore Trawsfynydd could meet the UK Government's aim of approving at least two projects in the next parliament. To realise this opportunity, Cwmni Eginó needs as soon as possible and **no later the end of 2023**:

- e) confirmation that DESNZ/ GBN wishes to proceed with development of Trawsfynydd as one of the projects planned for approval in the next Parliament;
- f) confirmation that DESNZ/ GBN will act as the sponsor for the project, either on its own or in partnership with WG;
- g) confirmation of the technology for Trawsfynydd; and

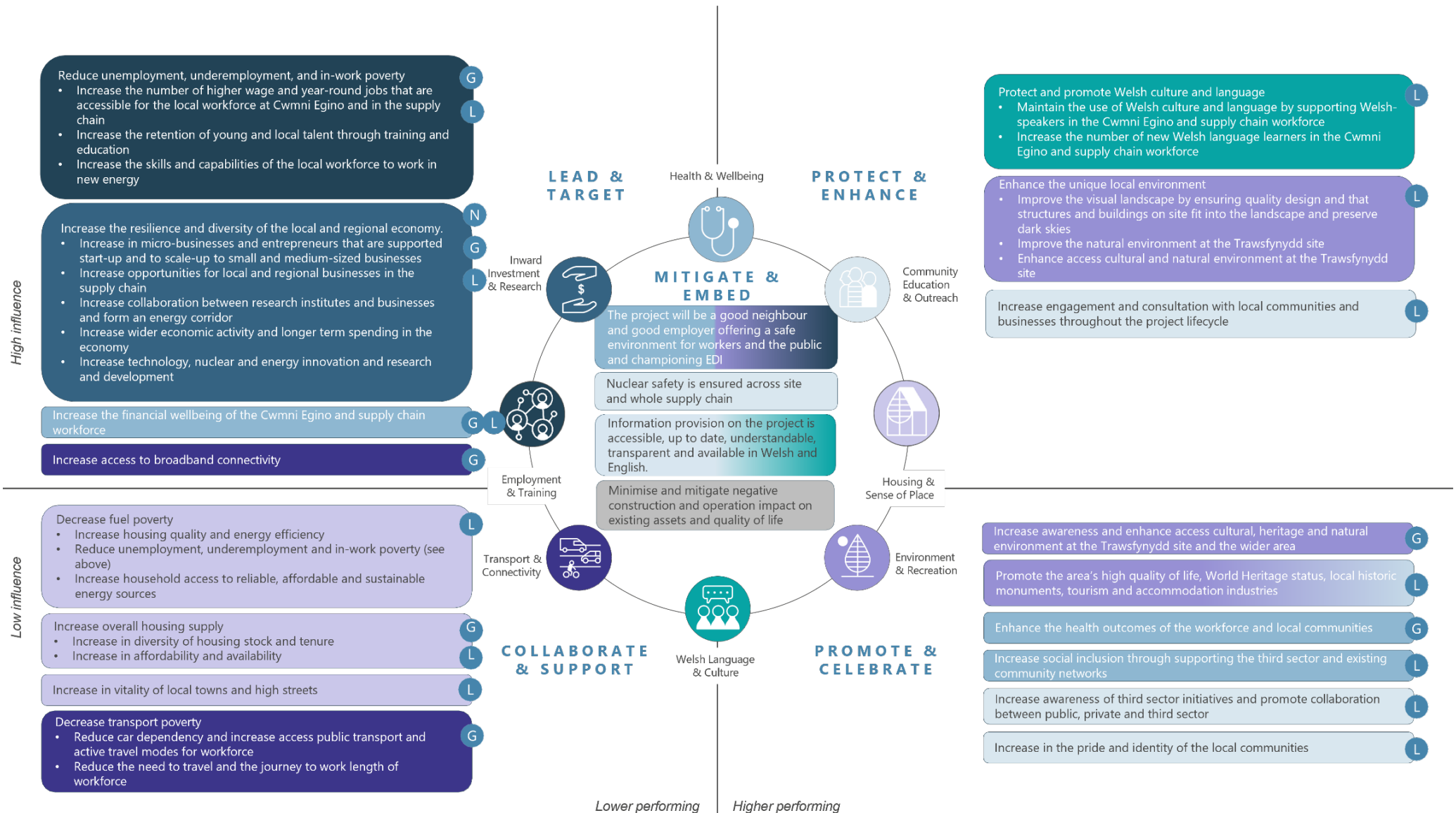
h) funding to meet the development cost to FID, estimated to be £250m.

Cwmni Eginio has prepared a draft Outline Business Case to support the sponsor in making a request for funding.

Glossary

DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero
DNS	Development of National Significance
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement & Construction
FID	Final Investment Decision
FNEF	Future Nuclear Enabling Fund
GBN	Great British Nuclear
GCA	Grid Connection Agreement
GDA	Generic Design Assessment
HPC	Hinkley Point C
HRA	Habitats Regulation Assessment
LCCC	Low Carbon Contracts Company
LDP	Local Development Plan
LNA	Local Needs Analysis
LURB	Levelling Up and Regeneration Bill
MRR	Medical Research Reactor
NDA	Nuclear Decommissioning Authority
NIA	Nuclear Industry Association
NPS	National Policy Statement
NRW	Natural Resources Wales
NWGD	North Wales Growth Deal
OBC	Outline Business Case
ONR	Office for Nuclear Regulation
RAB	Regulated Asset Base
RSR	Radioactive Substances Regulation
SEZ	Snowdonia Enterprise Zone
SMR	Small Modular Reactors
SNPA	Snowdonia National Park Authority
SOBC	Strategic Outline Business Case
SSPCSR	Site Specific Pre-Construction Safety Report
SZC	Sizewell C
TDSP	Trawsfynydd Site Development Programme
TOM	Target Operating Model
WBS	Work Breakdown Structure
WG	Welsh Government

Appendix 1: Social value emerging outcomes and Strategy



Appendix 2: Siting Options

Trawsfynydd site

The Trawsfynydd site was identified as an opportunity for nuclear deployment in the 1950s. It is situated in the heart of Snowdonia National Park. The nearest settlement of Trawsfynydd Village is to the south of the site. Access is via the A470 to the east which provides a strategic link between north and south Wales. Other significant settlements include Blaenau Ffestiniog 15km to the north and Dolgellau 21km to the South.



The site image above identifies a number of key boundaries:

- Red line denotes the boundary of NDA land ownership;
- Blue line denotes the nuclear site licence boundary; and
- Yellow line within the nuclear site licence boundary is the radiological controlled area.

Site context and land potentially feasible for development

Studies have been undertaken to examine the characteristics of the plots of land within the NDA land ownership which could feasibly support SMR development. In broad terms, the matters considered reflect the criteria adopted in the UK (Strategic Siting Assessment and National Policy Statement for Nuclear Power Generation - EN6) and with reference to the International Atomic Energy Authority (IAEA) Safety Assessment Principles (as appropriate). These include, but is not limited to:

- physical land availability;
- access to grid
- water supply;
- transport infrastructure;
- geology, ground conditions and topography; and
- environmental, landscape and heritage assets.

The three plots are of particular interest at this time are summarised below. Whilst the platform level has not been established for any of the plots referenced below, supporting studies have confirmed that it is possible, taking into account the landform across the plots, to minimise an imbalance between cut and fill, reducing the need for either the import or export of material to support SMR deployment.



Plot 1: Key characteristics

Plot 1 is in proximity to the existing nuclear power station and Radiological Controlled Area (RCA), the Intermediate Level Waste (ILW) store and further east, the 275kV and 400kV switchyard. It includes blocks of woodland and open land and car parks and abuts Llyn Trawsfynydd which lies to the south and includes berms historically constructed to assist water circulation. Without land assembly, i.e., extending into the area of Craig Gyfynys, Plot 1 could yield around 25 ha of available land. Recognising this is distributed within a variable boundary in respect of NDA land ownership, the area available for permanent works is likely to be approximately 15ha. Landform in this area is relatively uniform to the south with Llyn Trawsfynydd although rises further north towards Craig Gyfynys and east. This is particularly evident in topographical evaluation demonstrated by a marked variation of ~270m AOD at maximum elevation east and north through to the west and south at some 200m AOD

Plot 2: Key Characteristics

Plot 2 lies to the east and provides good access to the 400kV switchyard noting that the existing overhead lines come into the area of the plot to the east of the switchyard at 275kV from the north and 400kV from the south. The Scheduled Monument and enclosed hut group known as Nurse Cae Du is a notable feature. At its nearest point, this feature (which lies to the north) is around 300m from the boundary of NDA land ownership. Plot 2 comprises approximately 26.5ha of available land within the existing NDA land boundary to the east and north of the 400kV switchyard. There is a degree of variation in topography in the north to south axis particularly. Here, landform varies from a maximum elevation of some 210m AOD to 195m AOD along a single profile. Landform east to west also indicates a transition, rising to the east from some 170m AOD through to circa 205m AOD. Recognising this is distributed within a variable boundary in respect of NDA land ownership, the area available for permanent works is likely to be approximately 20 ha.

Plot 3: Key Characteristics

Plot 3 lies beyond the eastern edge of the power station site and A470. This area includes the former railhead owned by the NDA with track and railhead disused. Whilst immediately abutting the former railhead and A470 there is a wider dominance of scrub and woodland cover. Plot 3 is oversailed to the south west by the 400kV overhead lines which terminate into the 400kV switchyard to the west beyond the A470. The Scheduled Monument Tomen y Mur is situated to the eastern boundary of this plot and beyond, the Special Area of Conservation and Special Protection Area of Migneint-Arenig-Dduallt. Plot 3 is extensive comprising some 50ha. Land form variation is pronounced east to west, comprising some 190m AOD (east) through to 250m AOD (west). From north to south terrain gradually falls from a maximum elevation of some 270m AOD through to circa 240m AOD approaching the A470 (south). Recognising this is distributed within a variable boundary in respect of NDA land ownership, the area available for permanent works is likely to be approximately 42 ha.

Appendix 3: Participants in Market Engagement

Technology Vendors

Participant	Technology	Licensing status
ARC Clean Technology	<ul style="list-style-type: none"> Advanced – Molten Salt Reactor using HALEU Fuel 100MW electrical unit 	<ul style="list-style-type: none"> Currently progressing through US and Canadian Regulatory processes
Cavendish & – X Energy	<ul style="list-style-type: none"> Advanced - High Temperature Gas Reactor – that will use of Triso Fuel 80MW electrical unit 	<ul style="list-style-type: none"> Have applied to DESNZ to enter into UK Generic Design Assessment (GDA) process Currently progressing through US and Canadian Regulatory processes
GE Hitachi	<ul style="list-style-type: none"> Light Water Reactor – (Boiling Water Reactor) 300MW electrical unit 	<ul style="list-style-type: none"> Have applied to DESNZ to enter into GDA process Currently progressing through US and Canadian Regulatory processes
Holtec	<ul style="list-style-type: none"> Light Water Reactor 160MW electrical unit 	<ul style="list-style-type: none"> Have applied to DESNZ to enter into GDA process Currently progressing through US and Canadian Regulatory processes
Last Energy	<ul style="list-style-type: none"> Light Water Reactor 20MW electrical unit 	<ul style="list-style-type: none"> Not currently within any recognised regulatory licensing process
Moltex Flex	<ul style="list-style-type: none"> Advanced – Molten Salt Reactor 16MW electrical unit 	<ul style="list-style-type: none"> Not currently involved in any recognised regulatory licensed process
Nuscale	<ul style="list-style-type: none"> Light Water Reactor 77MW electrical unit 	<ul style="list-style-type: none"> Currently progressing through US and Canadian Regulatory processes
Rolls Royce SMR	<ul style="list-style-type: none"> Light Water Reactor 470MW electrical unit 	<ul style="list-style-type: none"> Progressing to Stage 2 of GDA

Star Core	<ul style="list-style-type: none"> • Advanced - High Temperature Gas Reactor that will use Triso fuel • Various options –20MW electrical unit 	<ul style="list-style-type: none"> • Not within any recognised regulatory licensing process
Terrestrial Energy	<ul style="list-style-type: none"> • Advanced - Molten Salt Reactor • 390MW Electrical unit 	<ul style="list-style-type: none"> • Currently progressing through US and Canadian Regulatory processes

Funding/Operator/Licensee

Participant	Interest/possible role
Atomic Acquisitions	Financier/Developer with close ties to Nuscale – exploration of project funding opportunities
EDF	Extensive Operator and licensee experience – exploration of possible operator and licensee role in any TOM

Appendix 4: Target Operating Model

Principal Roles required in the Target Operating Model

Role	Description
Sponsor	<ul style="list-style-type: none"> Responsible for championing the project and specifying what it needs to achieve. Owns the business case and secures the funding for the project. Ensures the project remains strategically aligned, viable and delivers its whole life value. Ensures benefits are on track to be realised
Owner	<ul style="list-style-type: none"> Shareholder/investor in the project company/Devco
Client	<ul style="list-style-type: none"> Responsible for developing and delivering the business case approved and owned by the sponsor. Specifies the technical requirements and manages the delivery outcomes. Intelligent customer – engages with the market and selects the most appropriate suppliers to meet project objectives. Asset owner and contract counterparty, including offtake agreement
Operator	<ul style="list-style-type: none"> Site Licence Company (SLC). Operates and maintains the asset. Design Authority that understands and controls the design and develops and maintains the safety case.
Technology Supplier	<ul style="list-style-type: none"> Responsible for design, manufacture and supply of the Nuclear Steam Supply System (NSSS).
Responsible Designer	<ul style="list-style-type: none"> Responsible for the design of the power plant, in particular the NSSS. Provides design support to all phases of the project lifecycle.
EPC	<ul style="list-style-type: none"> Responsible for the Engineering, Procurement and Construction of the power plant, including interface with the supply chain.
Fuel supplier	<ul style="list-style-type: none"> Design and supply of fuel. Support to the safety case.
e	<ul style="list-style-type: none"> Entity(ies) that purchase the output from the site and provide the revenue (e.g., Low Carbon Contracts Company (LCCC)).
Despatcher	<ul style="list-style-type: none"> Responsible for operational interface with National Grid and real-time despatch of the plant.

Allocation of Principal Roles during each phase of the project

Option 1: Client & Operator Combined

Role	Today	Development	Construction	Operation
Sponsor	WG	WG/ GBN	Owner	Owner
Owner	WG	WG/ GBN	3 rd party investors	3 rd party investors
Client	Cwmni Eginio	Devco	Devco	Devco
Operator	N/A	Devco	Devco	Devco
Despatcher	N/A	N/A	N/A	Operator/3 rd party
Technology Supplier	N/A	TBC	TBC	TBC
Responsible Designer		Technology Supplier	Technology Supplier	Technology Supplier
EPC		TBC	TBC	N/A
Fuel Supplier			TBC	TBC
Offtaker	N/A	N/A	LCCC/Other	LCCC/Other

Option 2: Client & Operator Separate

Role	Today	Development	Construction	Operation
Sponsor	WG	WG/ GBN	Owner	Owner
Owner	WG	WG/ GBN	3 rd party investors	3 rd party investors
Client	Cwmni Eginio	Devco*	Devco*	Devco*
Operator	N/A	Operator	Operator	Operator
Despatcher	N/A	N/A	N/A	Operator/3 rd party
Technology Supplier	N/A	TBC	TBC	TBC
Responsible Designer		Technology Supplier	Technology Supplier	Technology Supplier
EPC		TBC	TBC	N/A
Fuel Supplier		TBC	TBC	TBC
Offtaker	N/A	N/A	LCCC/Other	LCCC

Appendix 5: Key requirements for FID

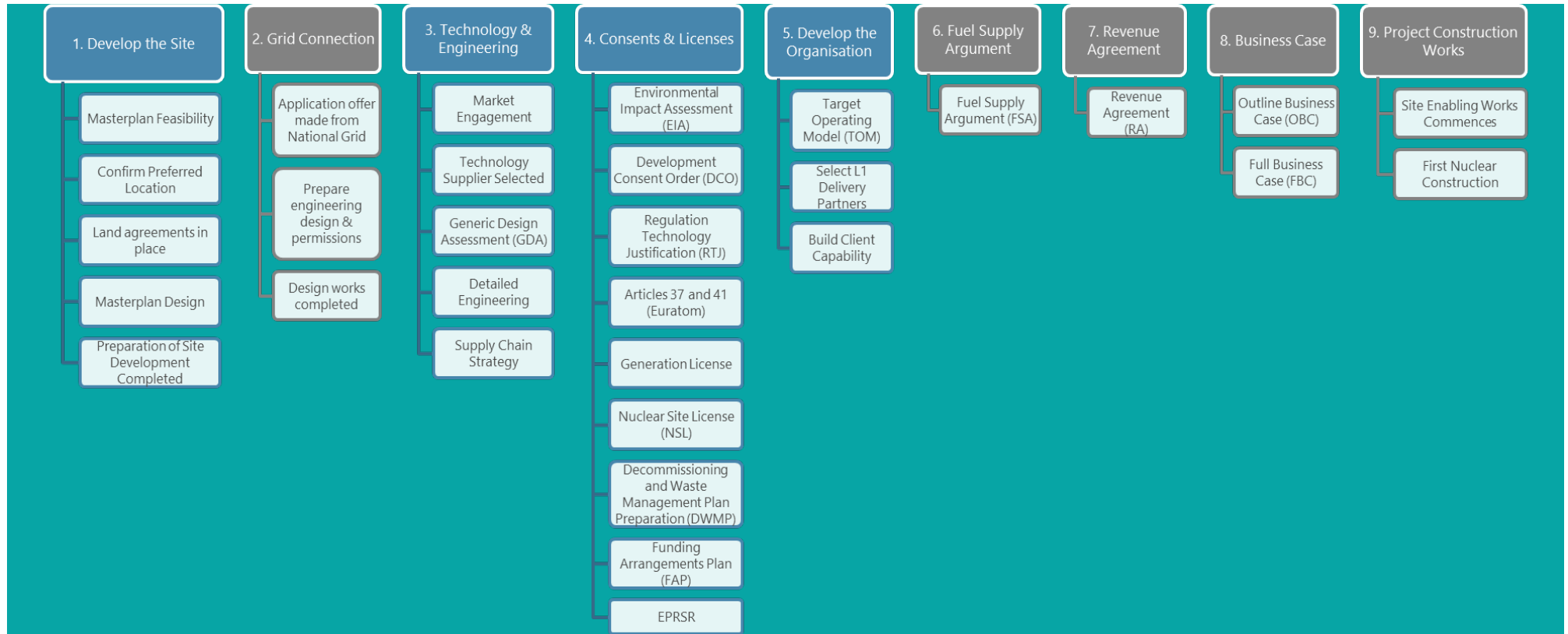
Key Requirement	Status at FID
Viable Site	<ul style="list-style-type: none"> • Sufficient land for the permanent facility and temporary construction requirements • Secure tenure over the above land • Site conditions suitable and feasible for construction and operation of a nuclear facility, including: <ul style="list-style-type: none"> • topography • geotechnical suitability • seismic hazard assessment • environmental conditions and constraints • cooling capacity • Adequate site access, including suitable transport routes • Access to utilities
Grid Connection	<ul style="list-style-type: none"> • Connection agreement with National Grid for the required export capacity and connection date • Compliance (or agreed derogation) with Grid Code
Technology & Engineering	<ul style="list-style-type: none"> • Technology partner selected • GDA (or equivalent safety assessment) completed • Strategy and plan to complete the specific preconstruction safety case agreed • Key manufacturing suppliers confirmed and equipment qualified • Plant performance characteristics validated • Basic design of power plant completed to underpin cost and schedule
Consents & Licences	<ul style="list-style-type: none"> • Development Consent Order • Nuclear Site Licence • Environmental Permit (EPRSR) • Regulatory Justification approved for selected technology • Generation licence • Abstraction and discharge licences

Funded Decommissioning Plan	<ul style="list-style-type: none"> • FDP approved by BEIS, including Decommissioning Waste Management Plan (DWMP) and Funding Arrangements Plan (FAP)
Organisation development	<ul style="list-style-type: none"> • Overall project structure defined, including the roles and responsibilities of primary project participants • Organisational development plans for Tier 1 and 2 participants, describing: <ul style="list-style-type: none"> • the capabilities required aligned to the schedule; • acquisition plans; and • acquisition plans on or ahead of target • Management arrangements to demonstrate compliance with nuclear site licence conditions in place and approved by ONR (NB part of nuclear site licence)
Commercial agreements	<ul style="list-style-type: none"> • Commercial structure of project defined, including roles and risk allocation between principal participants • RAB licence granted • Fuel supply agreement negotiated • Offtake agreement negotiated • Government Support Package agreed • Key plant supply and construction contracts negotiated
Finance	<ul style="list-style-type: none"> • Financing agreements for construction phase in place
Delivery	<ul style="list-style-type: none"> • Scope of work/ WBS & schedule to commercial operation defined • Delivery team established and ready to mobilise

These requirements are underpinned by supporting workstreams, including:

- engineering development to provide the required input to consents and permits, cost model, schedule development and revenue agreement,
- development of the commercial agreements to underpin the suite of contracts required, and
- stakeholder engagement to build broad support for the project and optimise the capture of socio-economic opportunities locally.

Appendix 6: Work Breakdown Structure (WBS) for Development to FID



Appendix 7: Milestones to FID

