Executive Overview
Low Carbon Energy Programme

HATCH

Executive Overview

i. The purpose of the business case is to demonstrate the optimal choice of projects for the delivery of the Low Carbon Energy Programme, which is part of the North Wales Growth Deal. The business case follows the structure of the Five Case Model and HM Treasury Green Book principles. It is structured into five cases – strategic, economic, commercial, financial and management.

ii. The North Wales Growth Deal is seeking to deliver a total investment of up to £1.1bn in the North Wales economy (£240m from the Growth Deal), to create 3,400 – 4,200 net additional jobs and generate £2.0- £2.4 billion in net additional GVA.

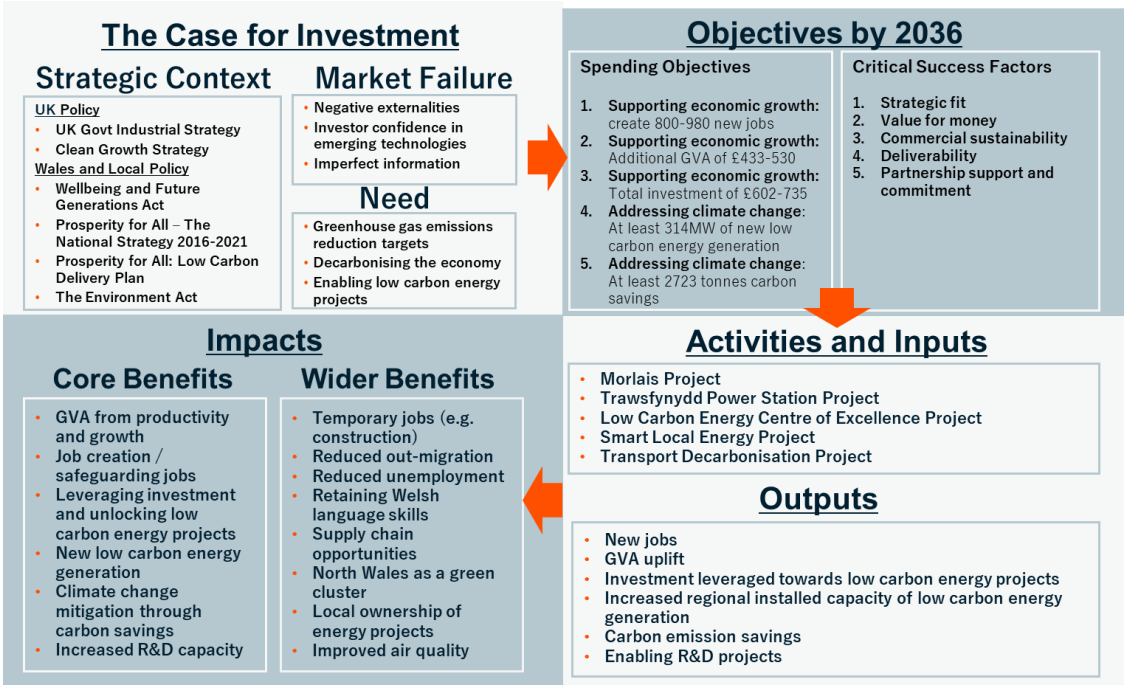
iii. The aim of the Low Carbon Energy Programme is to unlock the economic benefits of transformational low carbon energy projects and position North Wales as a leading UK location for low carbon energy generation, innovation and supply chain investment

iv. The business case is intended to inform the Final Deal Agreement, which follows the Heads of Terms agreement with the Welsh and UK Governments in 2019.

The Strategic Case

A summary of the logic model for the Low Carbon Energy Programme is set out below.

Figure 1.1 Low Carbon Energy Programme



Source: Hatch

Strategic Context

v. The North Wales Economic Ambition Board was established in 2012 and covers the six Local Authority administrative areas of the region of North Wales and University of Bangor, Glyndwr University, Coleg Cambria. The private sector has also shaped the

deal through the North Wales Mersey Dee Business Council and the Business Delivery Group.

vi. The aim of the Growth Deal is to build a more vibrant, sustainable and resilient economy in North Wales. Building on our strengths to boost productivity and tackling long term challenges and economic barriers to deliver inclusive growth. Our approach is to promote growth in a scalable, inclusive and sustainable way in line with the Future Generations Act.

vii. The Growth Deal builds on the Growth Vision for North Wales, adopted in 2016:

> *"a confident, cohesive region with sustainable economic growth, capitalising on the success of high value economic sectors and our connection to the economies of the Northern Powerhouse & Ireland."*

viii. The Growth Deal also aligns closely with the priorities of the UK and Welsh Governments in relation to economic development. There is particularly strong alignment with the UK Government's **Industrial Strategy,** the Welsh Government's **Economic Action Plan, the Well-being of Future Generations Act, and its cross-cutting themes.** Sustainability is at the core of the Growth Deal, and the investments will contribute towards Wales carbon emissions reduction targets.

The Case for Change

Spending Objectives

ix. The Low Carbon Energy Programme Spending Objectives are focussed on both supporting economic growth and addressing climate change:

Spending Objective 1 Job Creation	To create between 800-980 new jobs in North Wales through the programme by 2036
Spending Objective 2 GVA	To create net additional GVA of £433-530m through the programme by 2036
Spending Objective 3 Investment	To deliver a total investment of £602-£735m through the programme by 2036
Spending Objective 4 Low Carbon Energy Generation	To enable the deployment of at least 314MW of new installed low carbon energy generation capacity through the programme by 2036
Spending Objective 5 Carbon Savings	To enable carbon savings of at least 2723 Tonnes CO2e through the programme by 2036

Existing Arrangements

x. North Wales is a hub for low carbon energy generation, with the equivalent of 82% of its electricity consumption already coming from local renewable sources. The region hosts over a third of Wales' renewable energy capacity and has two nuclear licensed sites, Wylfa and Trawsfynydd. The region's geography and natural resources allow unique opportunities to deploy a broad range of low carbon energy technologies, with resources to scale up offshore and on shore wind generation, tidal stream energy, tidal range energy, hydro-power, solar and new nuclear generation.

xi. The low carbon economy supports over 430,000 jobs across the UK and directly generated £44.5 billion in turnover in 2017 (not including supply chain activity). Across Wales as a whole, the low-carbon economy is estimated to consist of 9,000 businesses, employing 13,000 people.

Business Needs

xii. **Supporting economic growth in low carbon energy sectors**: Exploiting local strengths and competitive advantages (e.g. existing energy infrastructure, research strengths, skilled workforce and natural resources) to drive growth in the low carbon energy sector where there are substantial growth opportunities nationally (sector is forecast to grow 11% per year to 2030). An estimated £11bn of additional investment is needed by 2035 to put the region on track to achieve Net Zero. This level of investment has the potential to create up to 24,400 new jobs.

xiii. **Addressing Climate Change**: Responding to the climate emergency declared by Welsh Government and the aim of achieving net zero by 2050. There is a need to decarbonise North Wales' energy system, including power (e.g. increasing low carbon energy generation), housing (including challenges associated with large numbers of homes being off the gas grid) and transport.

Potential Scope

xiv. As one of the three 'high-growth sectors' targeted within the Growth Deal, the aim of the Programme is to unlock the economic benefits of transformational low carbon energy projects and position North Wales as a leading UK location for low carbon energy generation, innovation and supply chain investment.

xv. The Programme consists of five projects: Morlais, Trawsfynydd Power Station, Low Carbon Energy Centre of Excellence, Smart Local Energy and Transport Decarbonisation

Benefits

xvi. The programme will lead to a number of direct and indirect benefits that will not only span the low carbon energy sector but the wider economy of North Wales. Some of the main benefits associated with meeting the programme's Spending Objectives are set out below:

- **Direct and indirect job creation** through unlocking energy infrastructure projects. Temporary jobs will also be required to support the construction phase of such projects.
- **Social and wellbeing benefits** such as reduced unemployment, reducing out-migration and retaining Welsh language skills within the region.
- **Climate change mitigation** through Investing in projects to increase low carbon energy generation or reduce fossil fuel / energy use. Investments will contribute towards a reduction in annual carbon emissions and meeting net zero targets.
- **Supporting the growth of regional supply chains** by supporting projects that offer opportunities to grow the regional supply chain (e.g. utilising Wales-based manufacturing/assembly capabilities).
- **Supporting innovation and R&D** will result in increased innovation, productivity and commercialisation within the low carbon sector.

Main Risks

xvii. There are a number of key risks to the successful delivery of the Growth Deal Portfolio including resources; delivery; cost; COVID-19; Brexit; Private and public sector investment; and political change. However, there are also specific risks such as Government policy shifts, consenting requirements, grid connectivity challenges and supply chain capacity that are applicable to the programme. The approach to managing these risks is considered in the Management Case.

Constraints and Dependencies

xviii. Notable constraints on the delivery of the Growth Deal include the total funding package of £240m, the 15-year term of the Growth Deal, the requirement for solely capital funding and State Aid considerations. The Growth Deal is dependent on securing the final deal, and on the engagement and collaboration with the private and public sectors. Projects within the programme may also be dependent upon supportive government policy that establishes support mechanisms and routes to market for emerging energy technologies.

The Economic Case

Critical Success Factors and Options Assessment

xix. The five projects that comprise the Preferred Option are summarised below:

Project	Summary Description	Outputs & Benefits	Cost/ Ask
Morlais, Lead: Menter Môn	Menter Môn aim to develop the first Tidal Stream Plug and Play site in the UK, creating the conditions for North Wales to develop primacy as an International Tidal Stream development hub. The Growth Deal investment will support the second phase of the project, which involves constructing the infrastructure that connects the Morlais Zone with the electricity grid system. Constructing the grid connection infrastructure would position the zone as the first consented, expandable and technology agnostic site in the world with up to 180 MW of potential. The infrastructure would then unlock private sector investment, with turbine technology developers leasing parts of the zone and spending up to £4m per mw to deploy their turbines at commercial scale and supply renewable energy to the grid.	14-180MW Installed Capacity of Low Carbon Energy £43m-£392m of indirect private investment unlocked through deployment of tidal turbines 90-110 operational jobs 63-804 tonnes of CO2e savings by 2036	Growth Deal Ask £9m Total infrastructure cost £36m

Project	Summary Description	Outputs & Benefits	Cost/ Ask
Low Carbon Energy Centre of Excellence Lead: Bangor University	Bangor University has recognised international expertise in low carbon energy research, particular nuclear, which offers an opportunity to act as an anchor for growth of the North Wales supply chain in these key sectors. Growth Deal funding will provide capital to develop infrastructure at Bangor University and Menai Science Park, enhancing capabilities for innovation in the energy sector and helping to create the conditions for new inward investment and business growth in the low carbon energy supply chain.	22-26 new jobs Unlocking R&D investment resulting in increased innovation, productivity and commercialisation within the low carbon sector. R&D projects delivered will increase knowledge transfer and business / academic partnerships with the private sector Grant capture	Growth Deal Ask £21m Total cost £97.7m
Trawsfyny-dd Power Station Lead: Cwmni Egino	The Trawsfynydd site is uniquely placed for a 'First of A Kind' deployment of a Small Modular Reactor (SMR) or Advanced Modular Reactor (AMR) due to its status as a publicly owned asset, its highly skilled workforce, and the supportive community. In combination with public and private sector investment, the Growth Deal will contribute funding towards enabling infrastructure, helping to secure jobs as well as position North Wales at the cutting edge of innovation and R&D in a technology that has significant potential for deployment across the UK.	300-700 MW new Installed Capacity of Low Carbon Energy (estimate of generating capacity of an SMR / AMR at Trawsfynydd) £360m direct private sector leverage and up to £2bn indirect private sector investment unlocked through enabling works (estimated capital cost of a 'First of a Kind' SMR) 455-557 new operational Jobs created. 2,660-2,206 tonnes of CO2e savings by 2036	Growth Deal Ask £20m Total cost £ 400m
Smart Local Energy Lead: NWEAB	To achieve its low carbon energy generation and carbon reduction targets, North Wales, Wales and the UK needs investment to overcome market failures and enable new private sector and community investment in smart local energy solutions. The Growth Deal will support a series of enabling and demonstrator projects to unlock new and innovative local energy projects, increase local ownership in energy investments	156-193 new jobs Unlocking investment in low carbon energy projects Increased capacity of low carbon energy projects Increased local ownership in energy investments Delivery of innovative demonstrator and enabler projects to contribute	Growth Deal Ask £25m Total project cost estimates: £106.2m

Project	Summary Description	Outputs & Benefits	Cost/ Ask
	and contribute to decarbonising the regional economy.	towards decarbonising the regional economy	
Transport Decarboni-sation Lead: NWEAB	Subject to further feasibility studies, Growth Deal funding will support delivery of demonstrator projects involving the production of green hydrogen from low carbon energy sources to decarbonise regional transport networks.	79-97 new jobs Decarbonised transport networks through procurement and deployment of hydrogen fuelled vehicles Green hydrogen production and usage	Growth Deal Ask £11.4m Total project cost £28.6m

xx. To demonstrate the strategic rationale for the Preferred Option, it was assessed against three alternative options: do nothing, a scaled down programme and a scaled up programme. Each option was scored based on how well it delivered against the programme Spending Objectives and five 'Critical Success Factors' (Strategic Fit, Value for Money, Commercial Sustainability, Deliverability and Partnership Support and Commitment). The Preferred Option is the only option which is effective across all Spending Objectives and Critical Success Factors.

xxi. Each of the constituent projects within the Low Carbon Energy programme will develop a project-level options assessment within the project business case.

Economic Appraisal

xxii. The Low Carbon Energy Programme is expected to deliver between **800-980 net additional FTE jobs** for North Wales, with a **NPV of £297-363m** and **£430-530m net additional GVA**. Based on all public sector funding for the Growth Deal, it will deliver a **benefit-cost ratio (BCR) of 1.1:1 – 1.4:1 (or 3.0:1 – 3.6:1 based on Growth Deal investment only**).[1]

xxiii. In interpreting these figures, it is important to note that there are a range of benefits that cannot be quantified or monetised in a robust fashion, but are still a significant consideration in the value for money case for the programmes. These include:

- Climate change mitigation
- Attracting inward investment
- Enhanced research and innovation capacity
- Temporary construction jobs
- Social & wellbeing benefits including retention of young people and reduced out-migration

xxiv. There are a number of risks to generating the scale of economic benefits estimated. The value for money assessment has been subjected to sensitivity testing at the programme level. The BCRs remain robust in the face of these tests.

xxv. A summary of the key findings from the economic appraisal of the Low Carbon Energy Programme is provided below.

[1] Note this includes an assessment of optimism bias in capital costs.

Table 1.1 Appraisal Summary Table	
Net Present Social Value (£m) (including Optimism Bias)	£59 – £72 (£206 – £252 based on GD costs)
Public sector cost (£m, (undiscounted, excluding optimism bias))	£227 (£86 from Growth Deal)
Appropriate Benefits Cost Ratio	1.1 – 1.4 (3.0 – 3.6 Growth Deal investment)
Significant unmonetizable costs/benefits	• Reduced CO2 • Inward investment • Spin-outs • Social/wellbeing benefits
Significant unquantifiable factors	TBC
Risk costs by type and residual optimism bias	24% optimism bias applied[2]
Switching values (for the preferred option only)	TBC
Time horizon and reason	15 year appraisal period. All infrastructure assets will have a residual value at this point

The Commercial Case

Commercial Strategy

xxvi. The NWEAB is committed to maximising the economic impact and value for money of the North Wales Growth Deal. The Board also recognises the potential to generate a commercial return on investment that could be reinvested in the region. Each project business case will be expected to explore commercial investment opportunities.

Procurement Strategy

xxvii. Our procurement strategy responds to Welsh policy and procedures. All Growth Deal procurement activity will be underpinned by a guiding set of principles, which are summarised below:

Procurement policy and principles	
Policy drivers	• North Wales Growth Vision • Wellbeing of Future Generations Act • Public Contract Regulations 2015 • Welsh Public Procurement Policy Statement • Welsh Government Code of Practice Ethical Employment in supply chains Government Commercial Operating Standards
Procurement Principles	• Regional leadership • Developing the regional economy by including local and regional economic considerations in contract opportunities, and improving access to SMEs • Promoting the use of local suppliers and local supply chains where possible

[2] Upper bound of standard buildings from HM Treasury guidance)

	• Maximising skills and employability opportunities through contract opportunities • Supporting community development through community wealth building and inclusion of cultural and Welsh language considerations in contracts • Supporting environmental sustainability by including environmental considerations in contract opportunities and minimising carbon footprint of projects where possible • Ensuring effective spending and value for money via regional collaboration; effective performance, risk, contract and fraud management arrangements

xxviii. Procurement activity will be the responsibility of the Lead Partner for each project. For regional projects, this responsibility will sit with the PMO.

The Financial Case

Capital and Revenue Requirements

xxix. The Low Carbon Energy Programme is based on the delivery of five projects with a total capital expenditure of £668.5m, of which £86.4m million is derived from the Growth Deal with the remainder provided by public and private sector partners.

Table 1.2 The capital expenditure requirements are based on the latest available project business cases and aggregated up to provide the programme estimates. Breakdown of Expenditure:

Project	Lead Partner	Growth Deal (£m)	Other Public (£m)	Private (£m)	Total (£m)
Morlais	Menter Mon	9	27	-	**36**
Low Carbon Energy Centre of Excellence	Bangor University	21	75.7	1	**97.7**
Trawsfynydd Power Station Project	Cwmni Egino	20	20	360	**400**
Smart Local Energy Project	NWEAB	25	6.2	75	**106.2**
Transport Decarbonisation	NWEAB	11.4	11.5	5.7	**28.6**
Programme Total		**86.4**	**140.4**	**441.7**	**668.5**

Project Maturity

xxx. The five projects within the programme are currently at different levels of maturity as shown by the table below:

Project	Business Case Stage*	Notes
Morlais	OBC	The Project is currently progressing to OBC stage. A business case is being drafted ready for submission to the NWEAB for consideration in early 2021.
Low Carbon Energy Centre of Excellence	OBC	The Project is progressing to OBC stage. Bangor University aim to submit the OBC to the NWEAB for consideration in 2021.

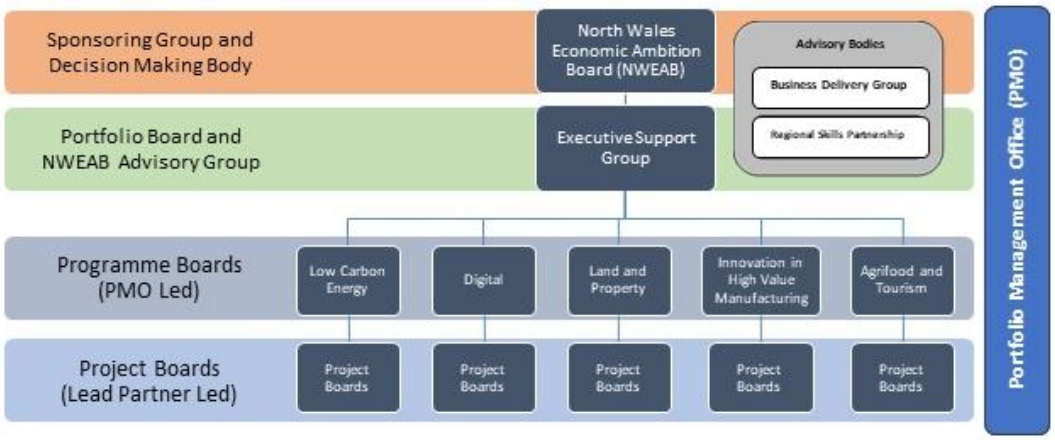
Trawsfynydd Power Station	SOC	The project is at an early stage of development. The EAB will engage with Cwmni Egino, Welsh Government and private sector partner(s) to coordinate investment and develop a project SOC / OBC.
Smart Local Energy Project	SOC / early project development	The project is currently at concept stage. Further feasibility and project scoping work will be delivered as part of the business case development process.
Transport Decarbonisation	SOC / early project development	The project is at currently at concept stage. Further feasibility and project scoping work will be delivered as part of the business case development process.

* Project business cases are developed in three stages – Strategic Outline Case (SOC), Outline Business Case (OBC), Full Business Case (FBC).

The Management Case

North Wales Growth Deal Delivery Structure

xxxi. The diagram below sets the delivery structure for the Growth Deal building on the existing structures put in place by the EAB's Governance Agreement. Details on these roles are set out in the management case:



xxxii. **Programme Boards -** Each programme will have a formal Programme Board and an appointed Senior Responsible Owner (SRO). These boards will be focused on the development (initially) and delivery of the agreed Programme Business Case, with a specific focus on the benefits and outcomes to be achieved. Programme Boards escalate to the Portfolio Board via the Programme Director. The Low-Carbon Energy Programme SRO is Dylan Williams, Deputy Chief Executive at Isle of Anglesey County Council.

xxxiii. **Portfolio Management Office (PMO) –** The PMO supports and co-ordinates activity across the programmes acting as an information hub and ensuring a consistent approach to reporting, control of risk/issues and programme assurance. Each

programme is assigned a Programme Manager from within the PMO. The Programme Manager for the Low Carbon Energy Programme is Henry Aron.

Project Business Cases

xxxiv. The North Wales Growth Deal is to be signed on the basis of a portfolio business case and five programme business cases. Once the final deal has been agreed, full 5 Case Model project business cases can be brought forward for the NWEAB to consider.

Risk Management

xxxv. The NWEAB has an adopted Risk Framework for the delivery of the North Wales Growth Deal. The approach to risk management is outlined in the Growth Deal Risk and Issues Management Strategy and User Guide. The key principles and concepts outlined in this strategy are drawn from OGC Management of Risk literature.

Timeline and Milestones

xxxvi. The NWEAB is seeking approval of the North Wales Growth Deal in December 2020 with the signing of the Final Deal. Following Final Deal, project business cases will be brought forward for the NWEAB to consider from early 2021 onwards.

Monitoring, Evaluation and Feedback

xxxvii. Programme and project performance will be monitored on a monthly basis through the relevant programme and project boards with formal quarterly reports submitted to the Portfolio Board and the North Wales Economic Ambition Board. A Monitoring and Evaluation Plan has been developed for the North Wales Growth Deal and will be agreed with UK and Welsh Government as part of the Final Deal.

Assurance

xxxviii. The PMO worked with the Welsh Government Assurance Hub to develop an Integrated Assurance and Approval Plan (IAAP) that sets out the assurance activities that will be undertaken at portfolio, programme and project level for the North Wales Growth Deal.

xxxix. As part of the IAAP, assurance activities will take place across all levels of the Growth Deal – portfolio, programme and project. The North Wales Growth Deal will utilise the pre-defined Gateway 0-5 and flexible Project Assessment Reviews (PAR) as appropriate and proportionate. The IAAP will be agreed with UK and Welsh Government as part of the Final Deal.