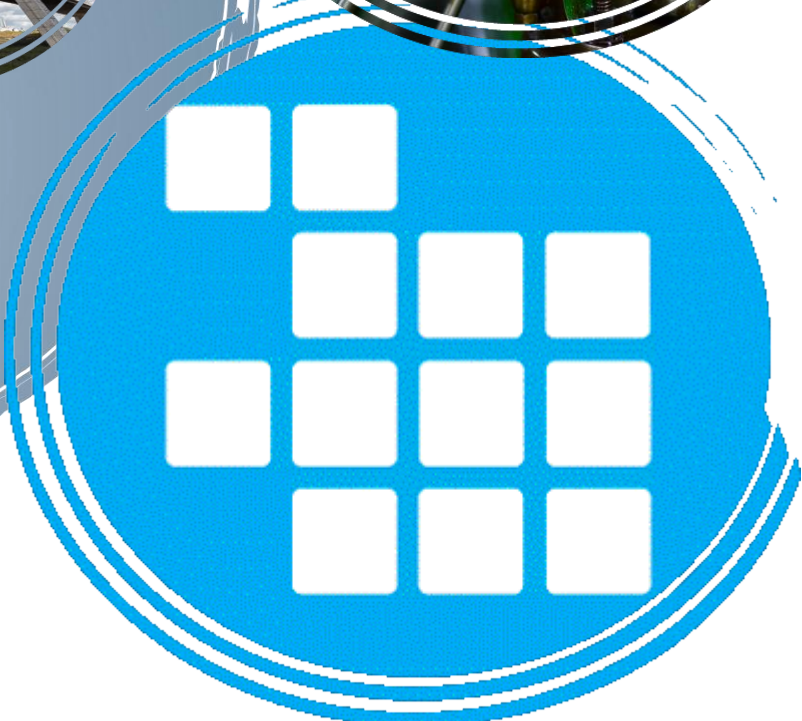


Executive Overview Innovation in High Value Manufacturing Programme



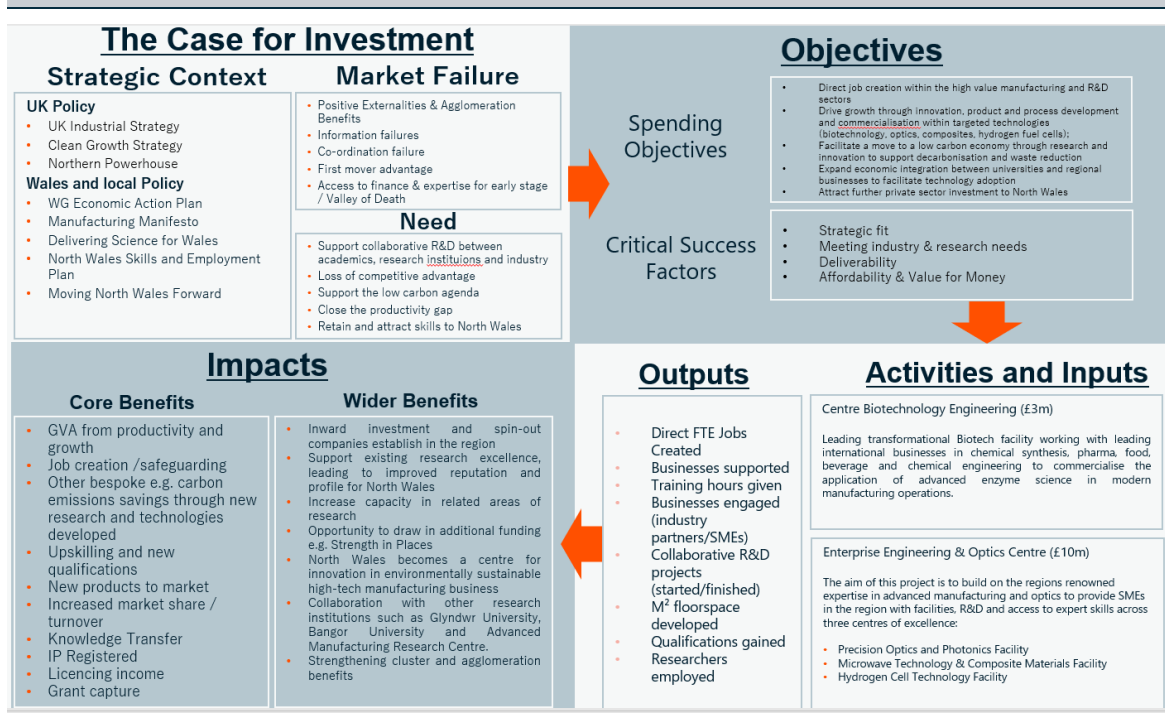
Executive Overview

- i. The purpose of the business case is to demonstrate the optimal choice of projects for the delivery of the Innovation in High Value Manufacturing Programme, which is part of the North Wales Growth Deal. The North Wales Growth Deal is seeking to deliver a total investment of up to £1.1 billion in the North Wales economy (£240 million from the Growth Deal), to create 3,400 – 4,200 net additional jobs and generate £2.0- £2.4 billion in net additional GVA.
- ii. 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, while 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.
- iii. The aim of the Innovation in High Value Manufacturing Programme is to consolidate North Wales' position as a powerful and innovative high value manufacturing cluster, building on existing specialisms and leading expertise to create a higher value, more diverse economic base that supports the transition to a low carbon economy.
- 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 Innovation in High Value Manufacturing is set out below.

Figure 1.1 Innovation in High Value Manufacturing



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 Innovation in High Value Manufacturing programme Spending Objectives are as follows.

Spending Objective 1 Job Creation	To create between 145 -180 new jobs in North Wales through the programme by 2036
Spending Objective 2 GVA	To create net additional GVA of £94m - £114m through the programme by 2036
Spending Objective 3 Investment	To deliver a total investment of £36 - 43m between through the programme by 2036
Spending Objective 4 Facilitate a move to a low carbon economy through research and innovation to support decarbonisation and waste reduction	Work in collaboration with 55 UK and international industry partners or SMEs to help develop low carbon technologies or waste reduction (TRL ¹ 1-5)
Spending Objective 5 Expand economic integration between regional universities and regional businesses to facilitate technology adoption	To support and facilitate three collaborative R&D projects per annum to develop and new technologies (TRL 1-5)
Spending Objective 6	Provide training and upskilling to 100 people/businesses in the targeted

¹ Technology Readiness Level (TRL)

Encourage skills development and knowledge transfer	technologies (biotechnology, optics, composites, hydrogen fuel cells) over the first 5 years
Spending Objective 7 Drive growth through product / process development and commercialisation within targeted technologies (biotechnology, optics, composites, hydrogen fuel cells)	Number of enterprises supported to take new products using targeted technologies from the laboratory to the market/firm (TRL 6-9). Targets to be agreed during Project Business Case development.

Existing Arrangements

- x. North Wales is a major manufacturing and engineering location with considerable strengths in the aerospace, automotive, food, paper, electronics and green energy sectors employing 36,000 people in North Wales. ² Deeside, for example, has one of the largest concentrations of aerospace manufacturing companies in the UK³.
- xi. North Wales hosts a number of industry-recognised research and innovation hubs linked to the High Value Manufacturing sector applying leading edge technical knowledge and expertise to the creation of products, production and processes and associated services, including:
- Wrexham Glyndwr University with recognised specialisms in optics (St. Asaph Campus), hydrogen cell technology, microwave technology and composite materials;
 - Advanced Manufacturing Research Centre (AMRC) Cymru which specialises in automation, Design for X, digitalisation, and product and process verification, in addition to developing the 'Wing of Tomorrow' with Airbus.
- xii. The Innovation in High Value Manufacturing Programme will capitalise on this strong network of anchor companies with international profiles and world leading expertise to develop a powerful high value manufacturing cluster – one which will be highly competitive on the global stage. Strengthening this sector in the region will significantly improve productivity and contribute significantly to sustainable economic growth.

Business Needs

- xiii. **Leading decarbonisation:** Business rewards for innovation supporting the shift to a low carbon economy are substantial, with UK 'green-collar' jobs expected to grow to 2 million and the value of exports from the low carbon economy to grow to £170 billion a year by 2030. The programme provides opportunities to further develop and commercialise cutting-edge technology that will support Wales, the UK's and global decarbonisation efforts.
- xiv. **Supporting innovation and R&D:** lack of facilities and technical support is holding back the potential of the sector, with individual businesses unable to access the skills and expertise to innovate and improve productivity via efficiency savings. Commercial developers are unwilling to take the risk to develop new start-up, R&D and training premises, especially when there is

² North Wales Regional Skills Partnership

³ Including Airbus, Gooch & Housego (Kent Periscopes), QinetiQ, Unimaq, Qioptic, Brother Industries, BAE, Wholebake foods, MDBA Systems, KK Fine Foods, Coveris, LoS, Cytec/Solvay, UPS2, DRB, Meadowvale foods

additional cost (i.e. specialist design or facilities) and often operating models that do not fit typical investment models. The programme is also supportive of the UK Government R&D Road Map, which identifies research and development as critical to economic and social recovery from the impacts of COVID-19.

- xv. **Improving productivity in North Wales:** In 2018, Wales noted the lowest productivity levels among the UK's 12 regions and countries (as per the NUTS1 classification). Output per hour (preferred ONS measure) was 17.2% below the UK average, whilst output per job was 18.2% below the UK average. Output per hour contracted by 1% in Wales relative to last year, which is the third lowest rate among UK regions and countries (ONS, 2020). Research by Cambridge University in 2014 found that HVM sectors contributed £275 billion (in GVA) to the UK economy and are acknowledged as highly productive sectors. It is estimated that AMRC Cymru could increase GVA to the Welsh economy by as much as £4billion⁴ over the next 20 years, which equates to £200 million in GVA per year. Demonstrating that supporting business with R&D and access to technologies has the potential highly productive.
- xvi. **Acting as a catalyst for supply chain integration:** A progressive depletion or 'hollowing out' of the Welsh and UK-based supply chain over recent decades represents a long-term threat to production and manufacturing capability and its future prosperity. Given the key role of SMEs in the supply chain, the need to actively re-build and sustain SMEs is a major structural challenge for the economy. The Innovation in High Value Manufacturing programme can help to develop resilient regional and national supply chains for the products of the future and supporting reshoring of key current supply chains by providing the technological efficiencies that make domestic production globally competitive.
- xvii. **Supporting good quality jobs with high level skills:** This provision of renowned centres of excellence in High Value Manufacturing will be a key driver in bringing the latest skills to the North Wales region. The programme will not only directly support high value and highly skilled jobs through the research facilities, it will also help indirectly support highly skilled jobs among regional businesses who are adopting innovative practices and technologies. This will help North Wales retain skills and graduates whilst providing local young people with future high value and skilled employment.

Potential Scope

- xviii. The strategic aim of the programme is to consolidate North Wales' position as a powerful and innovative high value manufacturing cluster, building on existing specialisms and leading expertise to create a higher value, more diverse economic base that supports the transition to a low carbon economy.
- xix. The two projects in the Innovation in High Value Manufacturing Programme are: the Centre for Environmental Biotechnology (CEB) and the Enterprise Engineering & Optics Centre (EEOC), described below.

⁴ Welsh Government, 2019; AMRC Cymru opens for business in North Wales; <https://gov.wales/amrc-cymru-opens-business-north-wales>

Main Benefits

- xx. The Programme will lead to a number of direct and indirect benefits for the North Wales economy. Some of the main benefits associated with meeting the Programme's Spending Objectives are set out below:
- **Supporting innovation and R&D:** lack of facilities and technical support is holding back the potential of the sector, with individual businesses unable to access the skills and expertise to innovate and improve productivity via efficiency savings.
 - **Improving productivity in North Wales:** It is estimated that AMRC Cymru could increase GVA to the Welsh economy by as much as £4billion⁴ over the next 20 years, which equates to £200million in GVA per year. Demonstrating that supporting business with R&D and access to technologies has the potential to be highly productive.
 - **Acting as a catalyst for supply chain integration:** The Innovation in High Value Manufacturing programme can help to develop resilient regional and national supply chains for the products of the future and support reshoring of current supply chains by providing technological efficiencies that make domestic production globally competitive.
 - **Supporting good quality jobs with high level skills:** This provision of renowned centres of excellence in High Value Manufacturing, will be a key driver in both bringing and retaining the sought-after skills to the North Wales region.

Main Risks

- xxi. Key risks to the successful delivery of the programme include resources, delivery, cost, COVID-19, Brexit, climate-related risk; private and public sector investment, end user company involvement and political change. However, there are also some specific risks such as lack or breakdown of collaboration, failure to recruit skills, loss of research leadership and regulatory change that are applicable to the programme. The approach to managing these risks is considered in the Management Case

Constraints and Dependencies

- xxii. Notable constraints on the delivery of the Growth Deal include the total funding package of £240million, 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 the range of emerging technologies described.

The Economic Case

Critical Success Factors and Options Assessment

- xxiii. The two projects that comprise the Preferred Option for the Innovation in High Value Manufacturing programme are summarised below. The projects were designed and developed through partnership working and co-production among the public, higher education and the private sectors in the region.

Project	Summary Description	Outputs	Costs / Ask
<p>Project 1: Centre for Environmental Biotechnology (CEB) Led by Bangor University</p>	<p>The CEB will be a world-leading centre in the discovery and characterisation of novel extremophilic enzymes of industrial relevance. The CEB will provide a strong foundation for attracting world-leading researchers, significant public and commercial research funding, and inward investment to Wales, building on an initial £5million ERDF investment into research capacity. The CEB also aims to draw companies in the biocatalysis sector to North Wales to take advantage of clustering and agglomeration benefits the regions offers due to its well-established specialism in bioengineering.</p> <p>Building on the successful model adopted by the University's Biocomposites Centre, the CEB project will also help drive new collaborations with industrial partners and other research institutions in innovative research areas, which will be supported by significant new investments by Bangor University. These investments will help build further capacity and infrastructure, to undertake innovative research, and provide innovators and businesses an environment where research innovations can be developed into diverse products, services, spinouts and start-ups, by reducing the development timeframe between research and commercially viable solutions.</p>	<ul style="list-style-type: none"> • Grant capture • New enterprises collaborating per annum • New researchers employed 	<ul style="list-style-type: none"> • Growth Deal Ask £3m • Total infrastructure cost £9.6m
<p>Project 2: Enterprise Engineering & Optics Centre (EEOC) Led by: Wrexham Glyndwr University</p>	<p>The Enterprise Engineering and Optics Centre will provide facilities (in Wrexham and St. Asaph) targeted to boost high level skills development for the region and enable SME's and large businesses to work in partnership with Wrexham Glyndwr University on commercially driven research and development.</p> <p>The provision of new state-of-the-art equipment that has wide industrial, R&D and educational application will support business in the region to deliver on the priority and growth sectors: High Value manufacturing, energy and environment,</p>	<ul style="list-style-type: none"> • Accessed by businesses • Businesses co-located • Businesses partnerships brokered • Jobs created • private sector investment leveraged • GVA generated 	<ul style="list-style-type: none"> • Growth Deal Ask £9.9m • Total infrastructure cost £29.8

construction. Key initiatives within the planned Enterprise Engineering and Optics Centre include:

- Precision Optical systems (St. Asaph)
 - Photonics technologies and facilities development (St. Asaph);
 - Microwave Technology and Composite Materials (Wrexham), and;
 - Hydrogen Cell Technology (Wrexham).
-

- xxiv. 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 Objectives and Critical Success Factors.
- xxv. Each of the constituent projects within the Innovation in High Value Manufacturing programme will develop a project-level options assessment within the project business case.

Economic Appraisal

- xxvi. The Innovation in High Value Manufacturing programme is expected to deliver between **145 - 180 net additional FTE jobs** for North Wales, with a NPV of £51million - £63million. Based on all public sector funding for the Growth Deal, it will deliver a **benefit-cost ratio (BCR) of 1.3 – 1.6 (or 4.1 – 4.9 based on Growth Deal investment only)**.⁵
- xxvii. 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:
- Attracting inward investment into high value sectors
 - Key sector development and competitiveness
 - Enhanced research and innovation capacity
 - Retention of young people
 - Rural sustainability.
- xxviii. There are a number of risks to generating the scale of economic benefits estimated, and 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.
- xxix. A summary of the key findings from the economic appraisal of the Innovation in High Value Manufacturing programme is provided below.

⁵ Note this includes an assessment of optimism bias in capital costs.

Table 1.2 Appraisal Summary Table	
Innovation in High Value Manufacturing	
Net Present Social Value (£m) (including Optimism Bias)	£16 – £19 (£40 – £49)
Public sector cost (£m, undiscounted, excluding optimism bias)	£39 (£13)
Appropriate Benefits Cost Ratio	1.3 – 1.6 (4.0 – 4.8)
Significant unmonetizable costs/benefits and unquantifiable factors	Spin-outs / Knowledge transfer / IP/Licensing / Clustering / Retaining young people
Risk costs by type and residual optimism bias	24% optimism bias applied (upper bound of standard buildings from HM Treasury guidance)
Switching values (for the preferred option only)	77% reduction in job creation
Time horizon and reason	15-year appraisal period used. All infrastructure assets will have a residual value at this point

The Commercial Case

Commercial Strategy

- xxx. 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

- xxxi. 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 • 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

	<ul style="list-style-type: none"> Ensuring effective spending and value for money via regional collaboration; effective performance, risk, contract and fraud management arrangements
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xxxii. Procurement activity will be the responsibility of the Lead Partner for each project. For regional projects, this responsibility will sit with the Portfolio Management Office (PMO).

The Financial Case

Capital and Revenue Requirements

xxxiii. The Innovation in High Value Manufacturing programme is based on the delivery of two projects with a total capital expenditure of £39.375million, of which £12.9million is derived from the Growth Deal with the remainder provided by public and private sector partners.

xxxiv. The capital expenditure requirements are based on the latest available project business cases and aggregated up to provide the programme estimates.

Table 1.3 The capital expenditure requirements are based on the latest available project business cases and aggregated up to provide the programme estimates.

Project	Lead Partner	Growth Deal (£m)	Other Public (£m)	Private (£m)	Total (£m)
Centre of Environmental Biotechnology	Bangor University	3.0	6.6	-	9.6
Enterprise Engineering and Optics Centre	Glyndwr University	9.9	19.9	-	29.8
Programme Total		12.9	26.5	-	39.4

Project Maturity

xxxv. The two projects within the programme are currently at different levels of maturity as shown by the table below. Both have benefitted from existing support through European Regional Development Fund (ERDF) to increase research capacity and industry engagement.

Table 1.4 Project Maturity

Project	Business Case Stage	Summary
Centre of Environmental Biotechnology	SOC	Project is ready to progress to the development of an OBC.
Enterprise Engineering & Optics Centre	SOC	Further work is required to demonstrate the complementarity to existing initiatives in North Wales before proceeding to OBC.

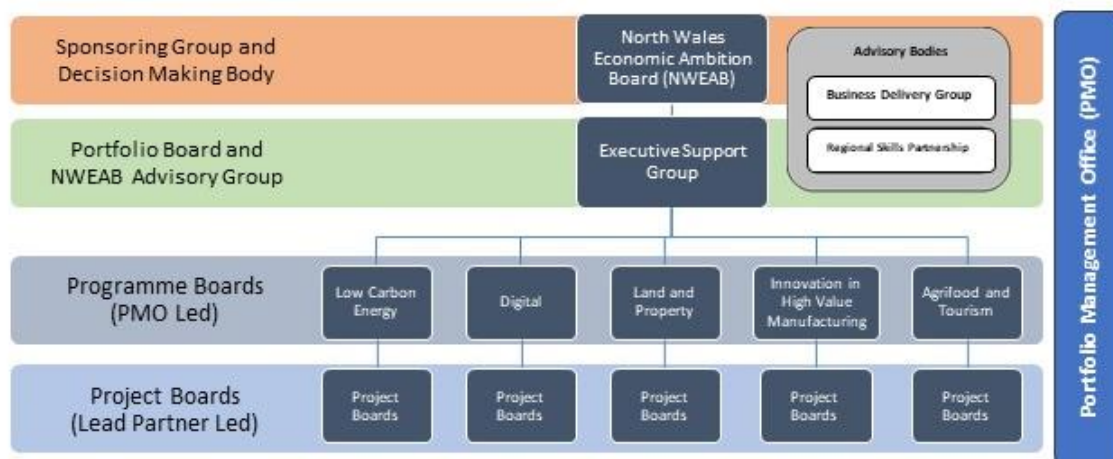
* Project business cases are developed in three stages – Strategic Outline Case (SOC), Outline Business Case (OBC), Full Business Case (FBC).

The Management Case

North Wales Growth Deal Delivery Structure

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

Figure 1.2 Growth Deal Delivery Structure



- xxxvii. **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 and issues. It also acts as a valuable assurance function, providing advice and challenge to programmes and projects. Each programme is assigned a Programme Manager from within the PMO. The Programme Manager for the Innovation in High Value Manufacturing Programme is Robyn Lovelock.
- xxxviii. **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 Innovation in High Value Manufacturing Programme Deputy SRO is Paul Bevan – Executive Director – Commercial Development at Grwp Llandrillo-Menai.

Project Business Cases

- xxxix. 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

- xl. 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

- xli. 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 January 2021 onwards.

Monitoring, Evaluation and Feedback

- xlii. 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

- xliii. 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.
- xliv. 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.