



Swansea Bay City Deal: Supporting Innovation and Low Carbon Growth

Programme Business Case (PBC) Version 4.0



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Introduction

The Supporting Innovation and Low Carbon Growth (SILCG) programme has been developed to deliver sustainable growth and job creation in the Swansea Bay City Region, with a targeted focus on the Port Talbot Waterfront Enterprise Zone area. It aligns to key priority areas such as UK Industrial Strategy, The Ten Point Plan for a Green Industrial Revolution, Welsh Government's Prosperity for All; The Economic Action Plan and Low Carbon Wales, Wellbeing of Future Generations Act (2015) and supports the Foundational and Circular Economies. The programme aims to create the right environment for innovation and new technologies to support the creation of a decarbonised and innovative economy.

The programme's **vision** is: ***to deliver low carbon, sustainable and inclusive economic growth for the region.***

The programme has evolved since the original 2017 Swansea Bay City Deal, and has been developed in response to a number of key drivers: the two reviews of the Swansea Bay City Deal in 2019, Welsh Government climate change emergency, the macro economic situation, and current strategies in the region, in particular the Port Talbot Waterfront Enterprise Zone Strategic Plan.

The programme is a place-based approach, focused on the Harbourside / Baglan Energy Park area of Port Talbot which will also have a regional, national and UK wide impact. The programme is based on need and opportunity - building on the region's skilled workforce, excellent transport links, a growing RD&I, energy and advanced materials knowledge and expertise base and is within the South Wales Industrial Cluster (SWIC)¹.

The projects are aligned to supporting the green industrial revolution and have been developed and will be delivered in partnership with government, industry and academia. The SILCG programme will promote low carbon, sustainable and inclusive growth for the region through a number of interlinked projects developed in partnership between Neath Port Talbot CBC, Swansea University and University of South Wales. The programme provides a range of specialist facilities to support collaboration and commercialisation of RD&I activities through to scaling up to late TRL levels and SME development and inward investment – supporting knowledge retention in the region. The programme will be a catalyst for further public and private investment, including supporting a green economic recovery post Covid 19.

¹ <https://www.swic.cymru/>

The Programme aims to deliver the following impact over 15 years:

- GVA uplift of approximately £6.2m per annum - £93m over 15 years
- 1,320 jobs created / safeguarded
- £11m minimum direct investment leverage (£5.5m private sector / £5.5m public sector) with planned additional funding leverage from public and private sources.

Programme summary

Project Summary
<p>Technology Centre (TC)</p> <p>A hybrid energy positive building providing a range of high quality, flexible, speculative office and laboratory space to support start-up businesses and indigenous business growth in the energy and renewables sector</p>
<p>SWITCH (South Wales Industrial Transition from Carbon Hub)</p> <p>A purpose-built facility and specialist equipment to support the steel and metals industry and supply chain to improve competitiveness by increasing product capability and reduce carbon emissions to meet legislative requirements.</p> <p>To strengthen collaboration between industry and academia</p>
<p>Hydrogen Stimulus project (H2)</p> <p>To 'link' the Technology Centre to the University of South Wales Hydrogen Centre at Baglan to enable excess renewable electricity from the Technology Centre to produce a clean, carbon-free hydrogen supply to fuel hydrogen vehicles.</p> <p>A demonstrator project to prove commercial viability of hydrogen to fuel</p>
<p>Air Quality Monitoring project (AQMP)</p> <p>To test alternative low-cost sensors to establish whether they provide a greater understanding of air quality and levels of pollution within targeted areas to help inform action plan measures on a local level.</p>

Low Emission Vehicle Charging Infrastructure (LEV)

To develop a Low Emission Vehicle charging strategy for the region to ensure a coordinated approach to decarbonise journeys in the Swansea Bay City Region.

To coordinate funding opportunities

To develop a pilot in the Valleys area e.g. community charging hub, how to address on-street charging, link charging to renewables generation in the Valleys area

Advanced Manufacturing Production Facility (AMPF)

To develop a hybrid building providing a range of production units with open access shared specialist equipment to support start-up companies and indigenous business growth in the innovation and manufacturing sectors, linked to energy and renewables.

A collaborative development between government, industry and academia based on the 'proving factories' concept (late TRL level to MRL level).

Property Development Fund (PDF)

To provide gap funding for bespoke and speculative commercial buildings in the Port Talbot Waterfront Enterprise Zone area to encourage private sector development, with a focus on the energy and renewables sector

This business case is structured in accordance with the Welsh Government's best practice Five Case Model (Better Business Cases), in the context of the wider Swansea Bay City Deal Portfolio and the totality of its contributory programmes (of which there are another eight, led by other regional local authorities). In this sense, it is important not to consider this programme in isolation, but as an investment proposition that focuses on key aspects of the SBCD portfolio as part of a 'bigger picture'.

The following section – the Executive Summary – provides a précis of each of the five cases and is designed to give the reader a quick and thorough overview of the programme, highlighting the key sections of each of the five cases. This is the 'ten-minute read' providing the reader with a 'map' to identify areas of interest and provide a guide to access the more comprehensive analysis in the main body of the document (as detailed in each of the five cases).

Executive Summary

Strategic Case

The strategic drivers at UK, national, regional and local levels shown in the business case are clearly aligned and support the development of proposals focused on low carbon economic growth. In particular:

- The UK and Welsh Government recognises the importance of decarbonisation to ensure economic growth is sustainable;
- There is a clear need to move towards renewable energy sources to increase efficiency and reduce costs, and for the public sector to exemplify this;
- Strategic imperatives to foster innovation and entrepreneurialism in high-value R&D-based opportunities;
- The creation of high-quality jobs is a clear link through all policy levels, as is a desire to provide training and development solutions to upskill existing workers.

The Supporting Innovation and Low Carbon Growth programme is aligned to UK and Welsh Government strategies and policies, in particular UK Industrial Strategy, Ten point plan for a Green Industrial Revolution, Clean Growth Strategy, Climate Change Act, Wellbeing of Future Generations Act (Wales), Economic Action Plan, Low Carbon Wales, A manufacturing future for Wales (consultation).

This programme will contribute to the overarching SBCD portfolio and the SILCG Investment Objectives are aligned to and will contribute towards the delivery of the SBCD portfolio Investment Objectives.

The Case for Change section provides the evidence base for change and the impact of the programme. It provides an overview of the current situation in terms of :

1. Swansea Bay City Region economy
2. Decarbonisation and legislative requirements
3. Manufacturing
4. RD&I environment

The summary section within Table 1.6: Summary of business needs of the Strategic Case demonstrates how the SILCG programme of interlinked projects addresses the business needs of decarbonising and diversifying the economy.

Theme	Existing arrangements	Investment objective	Business needs
Economic performance	<ul style="list-style-type: none"> • SBCR economy underperforming compared to UK: <ul style="list-style-type: none"> ○ GVA 74% of UK average and falling ○ 71% working age population employed (UK: 76%) • Fewer people with higher level qualifications compared to other regions of Wales and the UK. • Reliance on foundational industries for higher value jobs - strong steel industry and the foundation of UK steel industry. • Strong and increasing demand for steel from domestic and export markets, but domestic supply reducing. 	<p>1. To create 1,320 high value added jobs aligned to the green economy through creating the right environment for a resilient, diverse and sustainable regional economy by 2033.</p>	<ul style="list-style-type: none"> • Diversify the economy (industrial and manufacturing base), increase productivity and stimulate recovery by supporting the steel and metals industry. • Support the supply chain associated with the industrial and manufacturing base. • Develop skills in the region to support existing and developing industry, particularly working with the Skills and Talent programme to increase funding for decarbonisation-focused research specialists and work-based learning to ensure there are appropriate skills to support low carbon economy.
	<ul style="list-style-type: none"> • RD&I clusters exist in the region with a growing 		<p>2. To increase the region's GVA by approximately £93m by 2033</p>

Theme	Existing arrangements	Investment objective	Business needs
	<p>number of initiatives.</p> <ul style="list-style-type: none"> • Shortage of high quality, flexible commercial property in SBCR with demonstrated demand. 	<p>through supporting innovation and new product development in science, technology and manufacturing sectors - strengthening industry, academia and government collaboration.</p> <p>3. To secure over £11m in additional investment from public and private sources, and approximately £40m additional leverage from public and private research funding by 2033</p>	<p>of the SBCR steel and metals industry.</p> <ul style="list-style-type: none"> • Support industry, academia and government collaboration through applied research. <p><u>Commercial property:</u></p> <ul style="list-style-type: none"> • Address the cost/value gap with commercial property in the region. • Incentivise development of energy positive buildings. <p><u>RD&I infrastructure:</u></p> <ul style="list-style-type: none"> • Build on existing RD&I initiatives and support maintenance and growth of market share in the steel and metals industry so the UK and SBCR remain leaders in steel innovation, advancing RD&I and decarbonisation. • Address practical needs of RD&I commercialisation through spinouts, high growth startups

Theme	Existing arrangements	Investment objective	Business needs
			<p>and indigenous business growth – providing appropriate infrastructure and collaborative space for industry and academia, including flexible office/laboratory and industrial premises, with room for expansion.</p> <ul style="list-style-type: none"> • Encourage private sector investment in facilities and address the market failure/cost – value gap.
Environmental performance	<ul style="list-style-type: none"> • Strong legislative drivers to reduce GHGs at UK and Wales level. • Wales GHGs driven predominantly by energy generation and industry (particularly the steel industry). • High level of offshored CO₂. • Public sector desire to lead revolution in LEVs - few charging points and existing 	<p>4. To support innovation to influence a shift in the use of high CO₂ energy usage to low CO₂ energy usage in economic activities (industry, commercial buildings and transport) by 2033.</p>	<p><u>General:</u></p> <ul style="list-style-type: none"> • Meet net zero emissions target by 2050; decoupling economic growth from carbon emissions in the region. • Reduce importing of CO₂– diversify the economy and bring economic activity onshore, where possible. • Improve air quality. <p><u>Industry:</u></p>

Theme	Existing arrangements	Investment objective	Business needs
	<p>hydrogen centre.</p> <ul style="list-style-type: none"> • Energy emissions from commercial buildings not being addressed. • SBCR has range of conventional and renewable energy production assets (25% from renewables, 75% fossil fuels). 		<ul style="list-style-type: none"> • Reduce energy demand in industrial processes. • Decarbonise the steel and metals processing and reduce industrial emissions. • Support applied research into alternative low carbon fuel sources and new steel making technologies, considering the global emissions impact. <p><u>Energy:</u></p> <ul style="list-style-type: none"> • Rebalance energy production away from fossil fuels to low-carbon. Ensure the security of supply of zero carbon energy for heating and fuel. <p><u>Vehicles:</u></p> <ul style="list-style-type: none"> • Reduce emissions from public and private vehicles, encouraging the use of low carbon transport, using the public sector to lead by example in reduction of

Theme	Existing arrangements	Investment objective	Business needs
			<p>emissions for public vehicles.</p> <ul style="list-style-type: none"> • Need to increase capacity for low emission vehicle charging across the region. • Demonstrate commercial viability of the renewable generation of hydrogen and build on its use of hydrogen as an alternative to electric vehicles. <p><u>Buildings:</u></p> <ul style="list-style-type: none"> • Reduce energy demand and improve design of commercial buildings. • Investigate low carbon technologies for commercial buildings. • Incentivise new commercial buildings to be low-carbon.

Summary of main programme benefits, risks, constraints and dependencies are shown below:

Benefits	Risks
<ul style="list-style-type: none"> • Productivity gains including from commercialisation of R&D, using uplift in salaries of additional jobs to UK 	<ul style="list-style-type: none"> • Programmes slippage as a result of late business case approval, procurement delays or match funding requirements

<ul style="list-style-type: none"> • Commercialisation of new and improved products • Safeguard and create employment opportunities • More resilient supply chain • Increase academia and industry collaboration and innovation • Clustering impact • Establish the region as a test bed for innovative solutions to societal challenges e.g. decarbonisation of industrial processes including steel and metals industry, air quality, decarbonised economic growth • Reduction in energy demand and production of energy • Lower cost energy for commercial / industrial infrastructure 	<ul style="list-style-type: none"> • Increasing capital costs - further funding could be required i.e., unforeseen costs, changing requirements • Dependence on multiple funding sources • Failure to secure tenants - ongoing revenue responsibilities affecting long term sustainability • External risks such as Covid-19 and Brexit
Constraints	Dependencies
<ul style="list-style-type: none"> • Programme budget based on the fixed funding agreement between NPTCBC and the SBCD • 15-year funding profile to 2033 with a front-loaded delivery within 5 years • Budget must be largely capital investment • Availability of development sites • Planning and development parameters • Capital investment leverage from private sector • Public sector procurement rules • State Aid rules 	<ul style="list-style-type: none"> • Renewable energy projects within the region • SBCD Skills and talent project - combined approach across projects to identify skills and talent development requirements • Strategies and policy drivers: Governance process to ensure a continual review of any new policies and changes that could have a potential impact on programme delivery. • Private sector engagement: Stakeholder management at programme and project level. • Statutory Consents and Planning Approval

Economic Case

Part 1 of the Economic Case provides detail on the development of the SILCG programme – describing how it has not developed from first principles - it has developed organically over time, bringing together projects from the City Deal and the Port Talbot Waterfront Enterprise Zone strategic plan. As a programme the identified projects support economic development, diversification and growth of the economy, respond to climate change and improve air quality – the projects have evolved over time and are aligned to the green economy which is an important pillar of UK and Wales policy. The green economy offers opportunities for the SBCR to develop its emerging cluster of energy and technology related businesses, academic R&D institutions and a longstanding concentration of manufacturing industries, particularly in steel and metals.

The analysis shows that the SILCG programme adds value to the UK overall with an overall NPSV of about £94.7 million and the discounted BCR is 1.6. The table below summarises the conclusions of the revised CBA..

		Programme	TC	SWITCH	H2	AQMP	LEV	AMPF	PDF
A Net Present Social Value	£ million	94.7	18.1	29.3	0.0	0.0	0.0	29.6	17.7
B Public sector cost (or appropriate value for cost)	£ million	127.4	8.2	94.8	-	-	-	15.2	9.1
C Appropriate BCR	Ratio	1.6	2.4	1.3	na	na	na	2.2	2.2
D Significant unmonetisable costs/benefits		Full economic costs of counterfactual: erosion of industry base through lower levels of innovation and decarbonisation	Specific product innovation and outcomes of TC tenants and the impact of the TC on their survival and growth. Benefits included in BCR limited to income and productivity	Full economic costs of counterfactual under which the steel and metals industry and significant jobs are at risk	Not included in BCR calculation	Not included in BCR calculation	Not included in BCR calculation	Specific product innovation and outcomes of AMPF tenants. BCR used limited value of research adopting public sector research income as a proxy, other benefits included tenant income and productivity gain	Specific activities of fund recipient not included. Benefits included limited to income and productivity
E Significant unquantifiable factors		Economic implications to SW existing industry base and supply chain without innovation	Specific activities and products/services of TC tenants not known but strong evidence of demand	Economic implications to SW steel & metals industry of not meeting decarbonisation targets on time	Estimates of energy production, usage and carbon savings not known. Influence as a demonstrator and industry take-up of H2 as a result of this project not known	Estimates of implications for improving policy making and future positive impact on emissions and AQ unknown	Estimates of usage and carbon savings to be determined. Influence as a demonstrator and take-up of LEV as a result of project not known	Specific activities and products/services of AMPF tenants not known but strong evidence of demand	Specifically who, timing and take-up of fund not known but strong evidence of demand and take up
F Risk costs by type and residual optimism bias	£ million	4.7	0.8	2.8	-	-	-	1.1	Not included as budget rather than detailed cost estimate at this stage
G Switching values (for the preferred option only)		na							
H Time horizon and reason		30 years operations for buildings. Asset maintenance & overhaul included where known	Facility operational 2022, operations to 2052	Facility operational 2023, operations to 2052	na	na	na	Facility open in 2024, 5 year programme for providing equipment, operations to 2052	Take-up assumed to be 10% 2021, 30% 2022 and 100% 2023, operations to 2052, c30 year building life

Commercial Case

The Commercial Case sets out the proposed procurement arrangements for delivery of the preferred option, including:

- The proposed procurement strategy and route
- The proposed service requirements and required outputs
- The proposed approach to risk allocation
- The proposed charging mechanisms
- The proposed key contractual arrangements

As lead local authority for the programme, Neath Port Talbot CBC will lead each of these procurements. Neath Port Talbot CBC will therefore be responsible for ensuring compliance with public procurement rules and regulations.

As a public sector organisation Neath Port Talbot CBC has a duty to operate in an open, fair, and transparent way, allowing the market freedom of opportunity to trade with it. Its procedures for procurement are known as 'Contract Procedure Rules'. These are important as they help to:

- Give a legal and auditable framework to its procurement activities;
- Obtain value for money services for the public;
- Ensure the council complies with the law governing the spending of public money;
- Protect its staff and members from undue criticism or allegations of wrongdoing.

The Council also has a legal requirement to comply with EU Procurement Directives (and equivalents post Transition period). These are enforced in UK law through the Public Contracts Regulations 2015. This governs the way in which the public sector procurement process must be conducted for contracts over certain specified thresholds.

Financial Case

The Financial Case sets out the funding requirements for the preferred option and demonstrates overall Programme affordability.

The current investment breakdown is based on forecasted investment as of December 2020, and summarised below:

Investment breakdown at programme level

Expenditure	Year 1 (20/21) (£m)	Year 2 (21/22) (£m)	Year 3 (22/23) (£m)	Year 4 (23/24) (£m)	Year 5 (24/25) (£m)	Year 6 (25/26) (£m)	Year 7 (26/27) (£m)	Total (£m)
Capital	£ 3.00	£ 9.17	£ 8.83	£ 30.85	£ 6.65	£ 0.20	£ -	£ 58.70
Revenue	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
Total	£ 3.00	£ 9.17	£ 8.83	£ 30.85	£ 6.65	£ 0.20	£ -	£ 58.70
Funding								
Swansea Bay City Deal Grant	£ -	£ 6.12	£ 5.53	£ 29.20	£ 6.65	£ 0.20	£ -	£ 47.70
Public Sector	£ 3.00	£ 2.50	£ -	£ -	£ -	£ -	£ -	£ 5.50
Private Sector	£ -	£ 0.55	£ 3.30	£ 1.65	£ -	£ -	£ -	£ 5.50
Total	£ 3.00	£ 9.17	£ 8.83	£ 30.85	£ 6.65	£ 0.20	£ -	£ 58.70

Investment breakdown at project level

Supporting Innovation & Low Carbon Growth	Budget	City Deal	Funding (£m)					Total	Variance
			NPT	WG	ERDF	Private Sector			
1 Technology Centre	£ 8.50	£ 3.00	£ 1.30	£ 0.50	£ 3.70	£ -	£ 8.50	£ 0	
2 SWITCH	£ 20.00	£ 20.00	£ -	£ -	£ -	£ -	£ 20.00	£ 0	
3 Hydrogen Stimulus	£ 2.00	£ 2.00	£ -	£ -	£ -	£ -	£ 2.00	£ 0	
4 Air Quality Monitoring	£ 0.50	£ 0.50	£ -	£ -	£ -	£ -	£ 0.50	£ 0	
5 Low Emission Vehicles (LEV)	£ 0.50	£ 0.50	£ -	£ -	£ -	£ -	£ 0.50	£ 0	
6 Advanced Manufacturing Production Facility	£ 17.20	£ 17.20	£ -	£ -	£ -	£ -	£ 17.20	£ 0	
7 Property Development Fund	£ 10.00	£ 4.50	£ -	£ -	£ -	£ 5.50	£ 10.00	£ 0	
Total	£ 58.70	£ 47.70	£ 1.30	£ -	£ 3.70	£ 5.50	£ 58.70	£ 0	

As a result of the City Deal investment in specialist facilities and equipment which will improve collaboration between industry, the public sector and academia, it is estimated that the programme of projects will lever in an additional £10 million of private research income and nearly £30 million of public sector research income over 5 years post construction of the specialist facilities, with increased opportunities for clustering and inward investment.

Management Case

The purpose of the Management Case is to put in place the arrangements for the successful delivery of the programme. It provides evidence that the capability and capacity is in place to govern and deliver the programme, and arrangements are in place to manage programme risks.

Formal governance has been established and the SILCG Programme Board has been formally established with agreed Terms of Reference.

The programme will be delivered using proven programme and project management methodologies to ensure the outputs, benefits and outcomes are achieved in a controlled, well managed and visible set of activities. The programme team will be supported by a technical advisory group.

The programme has undergone a number of programme / project assurance reviews in the form of:

- External Peer Review
- Gateway Review – Project Assessment Review (PAR)
- Gateway Review – Critical Friend Review (CFR)

The programme received a Delivery Confidence Assessment of ‘amber’

The programme has on-going engagement with a range of stakeholders including Welsh and UK Governments, industry including Industry Wales, and academia in relation to RD&I and skills.

1.0 Strategic Case

The purpose of the Strategic Case is to make the case for change and demonstrate how the Supporting Innovation and Low Carbon Growth programme aligns with UK, Wales, regional and local strategies and policies as well as other ongoing programmes and projects.

1.1 Strategic Context

This section provides an overview of the lead organisation as well as a review of relevant strategies, policies and other ongoing programmes and projects to demonstrate strategic fit.

1.1.1 Organisational overview

Neath Port Talbot County Borough Council is the lead local authority for the Supporting Innovation and Low Carbon Growth programme, and project lead for the Technology Centre, Air Quality Monitoring project, Low Emission Vehicle Charging Infrastructure, Advanced Manufacturing Production Facility and Property Development Fund.

Neath Port Talbot is located at the centre of the south Wales economy between the cities of Cardiff and Swansea. It benefits from direct access via the M4 corridor with access to a wider catchment area for employment – analysis demonstrates that there is a working age population of 1.4 million, and one million jobs within an hour's drive of the Port Talbot Waterfront Enterprise Zone.

Neath Port Talbot CBC (NPTCBC) was formed in April 1996 following local government reorganisation. It is the 8th most populous in Wales, with a population of approximately 140,000. 17 wards within the local authority area are in the top 10% most deprived in Wales.

NPTCBC has a proven track record of delivering large capital programme and projects, on budget and on time, from a number of different funding sources including:

- PDR Harbour Way: **£111m**
- 21st Century Schools Programme: **£122m**
- Neath Port Talbot Physical Regeneration: **£15m**
- Vibrant & Viable Places: **£35m**

The council also has extensive experience of lead body status for several collaborative regional projects including:

- South West Workways: **£23m**
- Workways+: **£7.5m**

- Engage: **£21m**

Swansea University is project lead for the SWITCH project.

Swansea University (SU) was established in 1920 and in its 100-year history collaboration, training and innovation links with industry are the core DNA of the organisation.

Swansea University is a research-led university and has a proven track record in delivering large scale programmes and projects, from a number of different funding sources including:

- Materials Research Centre at Swansea has pioneered and delivered a range of unique collaborations focused in the advanced materials industrial cluster of South Wales.
- In 1992 Swansea Materials started one of the first three Engineering Doctorate centres in the UK with a focus on steel technology. The EngD has led to significant technology breakthroughs for the university and industry partners. It has also seeded a training escalator which supports skills growth at every level down to school engagement.
- Swansea is one of five UK Innovation and Knowledge centres focused on coatings for renewable energy generation, storage and release - SPECIFIC, which has supported over £50m research and innovation investment in the region to date, working with 20 research partners and more than 100 companies. The focus is on the development and adoption of low-cost PV and other solar technologies integrated into buildings to allow them to function as power stations.
- The £450m science and innovation campus (Bay Campus) opened in 2015 and has enabled significant expansions of the manufacturing research capabilities at Swansea University. Delivered in partnership with Neath Port Talbot CBC.
- The University hosts a UKRI manufacturing hub (SUSTAIN (£10M)) and prosperity partnerships (£5M) with the steel industry which are driving a collaborative approach between the five main UK steel producers to the challenges of decarbonisation and the opportunities for new recyclable steel products.

The **University of South Wales** is project lead for the Hydrogen Stimulus project.

The University of South Wales (USW) has a proven track record in delivering strategic programmes and projects, from a number of different funding sources. The USW track record in delivering hydrogen related projects includes:

- USW has researched low and zero carbon methods of producing hydrogen for over 30 years at its Sustainable Environment Research Centre (SERC) laboratories at its Glyntaff Campus (South Wales).
- Since 2008 its Hydrogen Centre in Baglan has been developing cost-effective hydrogen production and recovery approaches that dramatically lower the carbon footprint of existing industrial processes. The team of scientists and engineers have delivered over £80m worth of industrial projects.

A summary of relevant projects is outlined below:

- Green' Hydrogen Production - In 2008 USW installed the first commercial scale 'green' or renewable hydrogen production facility in Wales at the Hydrogen Centre on Baglan Energy Park. In 2011 the UK's first commercial installation of a PEM electrolyser was installed at the Hydrogen Centre.
- USW Hydrogen Refuelling Station - In 2009, USW (then as the University of Glamorgan) installed the first hydrogen refuelling station in Wales at the Hydrogen Centre (one of the first in the UK).
- Hydrogen Recovery to Decarbonise Steelmaking

1.1.2 Relevant business strategies

The SILCG Programme is aligned to and will directly contribute to deliver the following UK, national (Wales), regional and local strategies and policies:

Table 1.1: Relevant UK strategies and policies

Strategy/ Policy	Imperative	Programme Relevance
UK Industrial Strategy (2017)²	<ul style="list-style-type: none"> • Ideas – the world’s most innovative economy • People – good jobs and greater earning power for all • Infrastructure – a major upgrade to the UK’s infrastructure • Business environment – the best place to start and grow a business • Places – prosperous communities across the UK • Grand Challenge areas - Clean growth 	<ul style="list-style-type: none"> • SILCG programme is aligned to the 5 foundations for a transformed economy: ideas, people, infrastructure, business environment, places. • SILCG is aligned to the Clean Growth Grand Challenge. • SILCG will enhance competitiveness of regional economy by creating a knowledge ecosystem with suitable infrastructure to drive growth. • SILCG will encourage the creation of new businesses to capitalise on the research and development in the region. • SILCG will support Innovation in decarbonisation, energy generation and use, construction techniques and air quality improvement. • SILCG will strengthen the regional economic base through supporting critical industries, while diversifying and developing supplementary industries to reduce reliance on existing manufacturing base. • SILCG will support the use of hydrogen as a clean fuel will accelerate the growth of the green economy. • SILCG will increase productivity and help to close the GVA gap between the region and the rest of Wales and between Wales and the rest of the UK.
Ten point plan for a Green Industrial Revolution³	<ul style="list-style-type: none"> • Build back better • UK global leader in green technologies 	<ul style="list-style-type: none"> • SILCG programme is aligned to the aim to ‘build back better: to invest in making the UK a global leader in green technologies. • SILCG will stimulate the growth of low carbon hydrogen

² <https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future>

³ <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution>

Strategy/ Policy	Imperative	Programme Relevance
	<ul style="list-style-type: none"> • Growth of low carbon hydrogen • Shift to zero emission vehicles • Greener buildings 	<ul style="list-style-type: none"> • SILCG will support the ambition to the shift to zero emission vehicles • SILCG will construct greener buildings • SILCG will support green innovation • Port Talbot is identified in the plan as one of the places in the UK pioneering the decarbonisation of transport industry and power
Clean Growth Strategy⁴	<ul style="list-style-type: none"> • Decarbonisation all sectors of UK economy • Low carbon opportunities • Tackle climate change • 	<ul style="list-style-type: none"> • SILCG is aligned to the aim of clean growth i.e. economic growth while reducing greenhouse gases. • Decarbonising all sectors of the UK economy through the 2020s • The SILCG will support low carbon industries • The SILCG will support the BEIS ambition to accelerate the commercialisation of clean energy technologies and investment in smart energy systems.
Climate Change Act⁵	<ul style="list-style-type: none"> • Reduce carbon emissions 	<ul style="list-style-type: none"> • The Climate Change Act is the basis for the UK's approach to committing the Government to reduce emissions by at least 80% of 1990 levels by 2050, with 5 yearly interim targets. • The SILCG is aligned to this Act by transitioning to a low carbon economy.
Clean Air Strategy 2019⁶	<ul style="list-style-type: none"> • Improve air quality 	<ul style="list-style-type: none"> • The DEFRA Clean Air Strategy sets out the comprehensive actions required across all parts of government and society to improve air quality. • The SILCG programme is aligned to this strategy as it will support reduction in

⁴ <https://www.gov.uk/government/publications/clean-growth-strategy>

⁵ <https://www.legislation.gov.uk/ukpga/2008/27>

⁶ <https://www.gov.uk/government/publications/clean-air-strategy-2019>

Strategy/ Policy	Imperative	Programme Relevance
		emissions from industry and transport and monitor air quality.
The Road to Zero⁷	<ul style="list-style-type: none"> • Transition to zero emission road transport • Reduction in emissions from conventional vehicles 	<ul style="list-style-type: none"> • The Road to Zero Strategy outlines the mission to put the UK at the forefront of the design and manufacture of zero emission vehicles. • The target is for all new cars and vans to be zero emission by 2040. • It also aims to reduce emissions from conventional vehicles during the transition. • The SILCG programme aligns to this as it will develop a regional LEV strategy and coordinate funding opportunities / charging points activity to increase the number of charge points in the region. • The strategy states that the UK is well placed to be a global leader in hydrogen and fuel cell powered transportation which aligns to the SILCG programme.

Table 1.2 Relevant national (Wales) strategies and policies

Strategy/ Policy	Imperative	Programme Relevance
Taking Wales Forward 2016 – 2021 (WG)⁸	<ul style="list-style-type: none"> • Prosperous & secure • Deliver more and better jobs 	<ul style="list-style-type: none"> • Taking Wales Forward programme for government sets out how Welsh Government will deliver more and better jobs through a stronger, fairer economy, improve and reform our public services, and build a united, connected and sustainable Wales. • The SILCG programme is aligned to the priority area of 'prosperous and secure' as it will provide the right environment for job creation.
Well Being of Future	<ul style="list-style-type: none"> • Prosperity • Resilience 	<ul style="list-style-type: none"> • The SILCG programme is aligned to the 5 ways of working: long term;

⁷ <https://www.gov.uk/government/publications/reducing-emissions-from-road-transport-road-to-zero-strategy>

⁸ <https://gov.wales/taking-wales-forward>

Strategy/ Policy	Imperative	Programme Relevance
Generations Act 2015 (Welsh Government) ⁹	<ul style="list-style-type: none"> • Equality • Health • Community • Culture & Welsh Language • Globally responsible 	<p>prevention; integration, collaboration and involvement</p> <ul style="list-style-type: none"> • It is aligned to the 7 well-being goals: • A Prosperous Wales – provision of new employment opportunities, high quality jobs, training opportunities, diversification of the economy, re-use of brownfield land. Anticipated spin-out companies will stimulate further private and public investment in the region • A Resilient Wales - Safeguarding of existing, highly-skilled and well-paid jobs, provision of new business premises, with the necessary technological infrastructure to promote diversification and reduce overreliance on traditional industries and public sector employment • A More Equal Wales - the programme includes opportunities accessible to all to reduce societal inequalities • A Healthier Wales - with long-standing evidence demonstrating the positive impact of employment on health and well-being, improving air quality • A Wales of Cohesive Communities - through sustainable, viable employment • A Wales of Vibrant Culture and thriving Welsh Language - with increased employment opportunities supporting the language in the medium and longer term • A Globally Responsible Wales - design and delivery of buildings in line with sustainable development principles; using innovation to decarbonise industry, programme aligned to global needs.

⁹ <https://www.legislation.gov.uk/anaw/2015/2/contents>

Strategy/ Policy	Imperative	Programme Relevance
Prosperity for All: The National Strategy (Taking Wales Forward 2016 – 2021)¹⁰	<ul style="list-style-type: none"> • Deliver more and better jobs • Create a stronger and fairer economy • Build a sustainable Wales 	<p>The SILCG programme is aligned to the priority areas in the following ways:</p> <ul style="list-style-type: none"> • Creating high-value jobs leading to national prosperity • Support green growth to create sustainable jobs for the future. • Encourage a robust talent pipeline, benefitting the region through higher wages and lower levels of underemployment • Provide a focus for inward investment and indigenous business growth through innovation • Providing the right environment for businesses growth / diversification • Leverage world-wide collaboration through research facilities • Delivering wider benefits to the regional community
Prosperity for All: The Economic Action Plan (2017)¹¹	<ul style="list-style-type: none"> • Decarbonisation (public sector to be carbon neutral by 2030); • Innovation, high quality employment and skills development 	<p>The SILCG programme is aligned in the following ways:</p> <ul style="list-style-type: none"> • Aligned to the national thematic sector of High Value Manufacturing • Aligned to a number of areas in the Economic Contract: growth potential and progress in reducing carbon footprint • Aligned to calls to action: decarbonisation; innovation, entrepreneurship and headquarters; high quality employment and skills development; R&D, automation and digitalisation. • Focus on decarbonisation clearly aligns with key aims • Accelerating low-cost energy generation

¹⁰ <https://gov.wales/sites/default/files/publications/2017-10/prosperity-for-all-the-national-strategy.pdf>

¹¹ <https://gov.wales/prosperity-all-economic-action-plan>

Strategy/ Policy	Imperative	Programme Relevance
		<ul style="list-style-type: none"> • Investment in human capital, infrastructure and innovation to address productivity gap • A locus of innovation and research in the Neath Port Talbot region will strengthen the existing local economy and create new sustainable opportunities • Creating quality jobs and delivering industrially-relevant training in future-focused technologies and applications will support people-driven economic growth • Enabling public investment with social purpose, delivering increased value • Supporting public sector to become exemplar and drive green growth
Prosperity for All: Low Carbon Wales (2019) ¹²	<ul style="list-style-type: none"> • Key areas of environmental improvement including industry, transport and waste. • Driving sustainable growth and modern infrastructure. 	<p>The SILCG is aligned in the following ways:</p> <ul style="list-style-type: none"> • Creating high value jobs and innovation in clean growth will support the vision of establishing Wales as one of the best places in the world to live, work and do business; • Deliver research, infrastructure and solutions that are essential to delivering the rapid change needed to hit ambitious targets; • Opportunities to use active building (i.e. energy generating) technologies to pilot a modern construction sector; • Efficient use of resources and reuse of brownfield sites
Innovation Wales Strategy (2014) ¹³	<p>5 key themes</p> <ul style="list-style-type: none"> • Improving collaboration • Promoting a culture of innovation 	<p>Innovation Wales Strategy prioritises low carbon as a key strength on which to build.</p> <p>The SILCG is aligned in the following ways:</p>

¹² https://gov.wales/sites/default/files/publications/2019-06/low-carbon-delivery-plan_1.pdf

¹³ <https://gov.wales/innovation-wales-strategy>

Strategy/ Policy	Imperative	Programme Relevance
	<ul style="list-style-type: none"> • Providing flexible support & finance for innovation • Innovation in Government • Prioritising and creating critical mass 	<ul style="list-style-type: none"> • Leading the way through public sector exemplar investment in a cohesive low carbon strategy for the region; • Improved opportunities for supply chain productivity; • Innovation in decarbonisation will lead to growth of new company clusters in recycling technology, the circular economy, component manufacture and modular construction; • It will also increase the research capacity and capability for the region, paving the way for future growth in other sectors.
A manufacturing future for Wales: a framework for action (2020)¹⁴	<ul style="list-style-type: none"> • Ensuring sustainability of manufacturing post Covid 19 • Green based – decarbonising industry as a priority, embrace the opportunities of a circular economy • Place based – focused on strength of an area • People based – role of education in securing future prosperity 	<ul style="list-style-type: none"> • The SILCG is aligned to the 4 pillars and 10 themes of the framework: The SILCG programme will: <ul style="list-style-type: none"> • Directly support the plans for clean, green growth with focus on decarbonisation and waste utilisation – setting the foundations for a circular economy in a regional eco-system that synergizes benefits and growth; • The cluster expertise in the area will create an ideal location to deliver green innovation through innovators, supply chain, infrastructure and manufacturers across a range of sectors; <p>Academic and industrial partnership will offer opportunities to develop specialist learning and training to ensure a long-term talent pipeline aimed at attractive, high-quality career opportunities with longevity and resilience.</p>
Environment (Wales) Act (2016)¹⁵	<ul style="list-style-type: none"> • Management of natural resources 	<p>The Act requires the planning and management of Wales’ natural resources in a more sustainable and joined-up way. Part 2 (Climate Change) is particularly</p>

¹⁴ <https://gov.wales/sites/default/files/consultations/2020-09/manufacturing-future-wales-consultation-document.pdf>

¹⁵ <https://www.legislation.gov.uk/anaw/2016/3/contents/enacted>

Strategy/ Policy	Imperative	Programme Relevance
	<ul style="list-style-type: none"> Positively impacting climate change Emissions reduction 	<p>relevant to this Programme focusing on reducing emission targets by 2050.</p> <p>The SILCG is aligned in the following way:</p> <ul style="list-style-type: none"> Contribute to emissions reduction by creating solutions for commercialisation that will allow a range of manufacturing sectors to decarbonise; Promote use of renewable energy sources; Develop energy positive construction technologies to reduce emissions from buildings, providing demonstrators to a wider audience.
Commercial Property: Market Analysis and Potential Interventions <small>16</small>	<ul style="list-style-type: none"> Address gaps in supply of commercial property 	<p>The SILCG programme is aligned to this policy in the following way:</p> <ul style="list-style-type: none"> Supports intervention through creation of 900,000 sq ft of new space over a rolling three-year period, providing premises in a new way Creation of this space will support indigenous business and encourage inward investment through delivering a modern, attractive and suitable infrastructure for innovative development
Clean Air Plan for Wales (consultation, 2020) ¹⁷	<ul style="list-style-type: none"> Improve air quality for health, nature & prosperity 	<ul style="list-style-type: none"> The plan aims to improve air quality through air quality modelling and real time monitoring to ensure there is a targeted approach. <p>The SILCG is aligned in the following way:</p> <ul style="list-style-type: none"> The programme will enhance monitoring to better understand how and where impacts on air quality are made; Focus on identifying sources of PM10s and hence identify corrective actions

¹⁶ <https://gov.wales/sites/default/files/publications/2020-08/market-analysis-and-potential-interventions.pdf>

¹⁷ <https://gov.wales/clean-air-plan-wales>

Strategy/ Policy	Imperative	Programme Relevance
Electric Vehicle (EV) charging strategy for Wales (consultation) 18	<ul style="list-style-type: none"> • Draft strategy for EV charging in Wales • Current charging provision in Wales for cars & vans • Future charging needs 	<p>The SILCG is aligned in the following way:</p> <ul style="list-style-type: none"> • Coordinated approach for the region • Mapping current situation, behaviour and future demand in relation to low emission vehicles <p>Aligned to the Wales strategy</p>
Regional Investment in Wales ¹⁹	<ul style="list-style-type: none"> • 4 investment priority areas: • Business productivity & competitiveness • Healthier, fairer and more sustainable communities • Zero carbon economy • Reducing economic inequalities 	<p>The SILCG is aligned in the following way:</p> <ul style="list-style-type: none"> • Creating the right environment for sustainable and inclusive jobs and growth • Opportunities to grow and strengthen productivity and competitiveness of SMEs in green industrial revolution • Opportunities for research and innovation in collaboration with government, industry and academia. • Economic growth and decarbonisation

Table 1.3: Relevant regional and local strategic and policy drivers

Objectives/ Goals	Imperative	Programme Alignment
Swansea Bay City Region Economic Regeneration Plan (2017) ²⁰	<ul style="list-style-type: none"> • Business Growth, retention and specialisation • Skilled and Ambitious for Long-term Success 	<ul style="list-style-type: none"> • Supporting indigenous companies and industries which are economically critical in terms of GVA and employment • Supporting economic diversification through value added jobs • Creating the physical and knowledge-based infrastructure to foster and encourage innovative start-ups, providing support to ensure retention and growth of

¹⁸ <https://gov.wales/sites/default/files/consultations/2020-12/electric-vehicle-charging-strategy-consultation-document.pdf>

¹⁹ <https://gov.wales/regional-investment-wales-framework>

²⁰ <https://www.swansea.gov.uk/swanseabaycityregioneconomicregenerationstrategy>

Objectives/ Goals	Imperative	Programme Alignment
	<ul style="list-style-type: none"> • Maximising Job Creation for all • Knowledge Economy and Innovation • Distinctive places and competitive infrastructure 	<p>new businesses, a 'knowledge economy' where innovation thrives</p> <ul style="list-style-type: none"> • In particular, support early-stage knowledge-intensive firms through incubation and innovation stages • Creating highly skilled and well-paid jobs, developing skills to maximise employment in growth sectors • Removing barriers to employment • Providing infrastructure assets to support business as a regional gateway • Supporting business as a regional gateway, increasing entrepreneurial culture • Through specialised training solutions, deliver a talent pipeline for high-growth sectors • Support the 'internet coast' through next-generation digital infrastructure, creating future energy systems, integrating renewable energy with existing asset base and delivering leading-edge research • Contribute to the key themes: <ul style="list-style-type: none"> ○ embeddedness - existing base of trained labour ○ relatedness - diversifying existing strengths in the area via the metals industry ○ connectedness - already established network of steel and metals companies in the area
Regional Economic Framework²¹	<ul style="list-style-type: none"> • Long term economic development of the region 	<ul style="list-style-type: none"> • The SILCG programme is aligned in the following way: • Addressing the areas of weaknesses / threats – will increase productivity, create employment opportunities, provision of low carbon high quality business infrastructure

²¹ <https://businesswales.gov.wales/mid-wales-and-south-west-wales-economic-frameworks>

Objectives/ Goals	Imperative	Programme Alignment
		<ul style="list-style-type: none"> • Build on the strengths of sectoral strengths in energy, advanced manufacturing and innovation centres. • The SILCG programme is aligned to the SBCR Regional Delivery Plan as this action plan will focus on diversification, energy and renewables sectors.
NPT Council Decarbonisation and Renewable Energy (DARE) Strategy (2020)²²	<ul style="list-style-type: none"> • Response to climate emergency • Reducing carbon emissions • Limiting future climate change 	<ul style="list-style-type: none"> • Maximising the environmental, social and economic benefits of decarbonisation • Clean air for everyone • Focus on strategies to reduce traffic-related poor air quality, industrial sources and nuisance dust • Addressing fuel poverty through accelerating development of active building technologies • Improving community engagement through communications as well as demonstrators – establishing infrastructure to position the region as an exemplar in the field • The SILCG programme supports the key areas of transport, industry, air quality and buildings to underpin the strategy and commitments to decarbonisation
NPTCBC Corporate Plan 2019-2022²³	<ul style="list-style-type: none"> • Developing economy and environment to improve well-being 	<ul style="list-style-type: none"> • Creating opportunities for spin-out companies and further inward investment • Supporting sustainable economic growth through green processes, building resilience
Port Talbot Waterfront Enterprise Zone²⁴	<ul style="list-style-type: none"> • Create diversified, resilient economy building on local strengths in steel, 	<ul style="list-style-type: none"> • Recognising importance to the region of the manufacturing base, supporting its sustainability and clean growth through innovation and decarbonisation • Creating infrastructure and ecosystem needed to deliver a diversified economy

²² <https://www.npt.gov.uk/media/13541/dare-strategy-may-20.pdf?v=20200522162830>

²³ <https://www.NPTCBC.gov.uk/19450>

²⁴ <https://businesswales.gov.wales/enterprisezones/zones/port-talbot-waterfront>

Objectives/ Goals	Imperative	Programme Alignment
	energy and manufacturing	<ul style="list-style-type: none"> • Providing attractive and functional employment sites in the region, which is fundamental to securing investment • Creating (and supporting existing) necessary high value, skilled jobs <p>(PTWEZ letter of support Annex 1.1)</p>

Paris Agreement 2015

In addition to UK and Wales strategies and policies, the programme is also aligned to the Paris Agreement 2015²⁵. The Paris Agreement brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects. Renewables, green hydrogen and carbon capture utilisation and storage (CCUS) will be key to task of keeping global warming within 2-degrees if it hopes to hit the target set as part of the Paris Climate Agreement.

Foundational Economy

The programme will support and grow the foundational economy²⁶ by challenging the conventional way of providing business premises, and nurturing an environment / cluster of innovative, state up and growing / diversifying indigenous businesses.

Circular Economy

The SILCG programme is aligned to the circular Economy strategy²⁷ to move towards zero waste by 2050, scrutinise how we use resources, maximise the economic and social opportunities of a more circular economy. The SWITCH project is closely aligned with this strategy.

1.1.3 Links with other relevant initiatives, programmes and projects

At the national (Wales), regional and local level there are a number of complementary initiatives, programmes and projects to which the SILCG programme is aligned and will add value, including:

²⁵ <https://www.un.org/en/climatechange/paris-agreement>

²⁶ <https://businesswales.gov.wales/foundational-economy>

²⁷ <https://gov.wales/circular-economy-strategy>

Table 1.4 Links with other relevant initiatives

Initiative	Relevance to this Programme
Swansea University²⁸	Swansea University is a partner and will deliver the SWITCH project
University of South Wales Hydrogen Centre²⁹	The Hydrogen Centre is a partner in the hydrogen stimulus project.
Active Building Centre³⁰	The Supporting Innovation and Low Carbon Growth programme and the Active Building Centre are aligned in a number of ways and will continue to work together to accelerate market adoption of energy positive and net zero buildings.
Flexis³¹	Port Talbot is a demonstration zone identified in the Flexis programme.
Cardiff University³²	Welsh School of Architecture are advisors for the Technology Centre
University of Wales Trinity St David³³	A partner in the Industrial Futures theme.
Neath Port Talbot Group of Colleges³⁴	A key partner in ensuring the region has the necessary skills to deliver the opportunities in this Programme
SWIC³⁵	The SILCG programme supports the work of SWIC and the projects will deliver some of the targets of SWIC i.e. to decarbonise the south Wales industrial cluster.

The SILCG programme stakeholder engagement plan is detailed in the Management Case.

²⁸ <https://www.swansea.ac.uk/>

²⁹ <http://www.h2wales.org.uk/pages/hydrogen-centre/hydrogen-centre.html>

³⁰ <https://www.activebuildingcentre.com/>

³¹ <https://www.flexis.wales/>

³² <https://www.cardiff.ac.uk/>

³³ <https://www.uwtsd.ac.uk/>

³⁴ <https://www.nptcgroup.ac.uk/>

³⁵ <https://www.swic.cymru/>

1.1.4 Strategic drivers summary

The strategic drivers at UK, national, regional and local levels shown in the business case are clearly aligned and support the development of proposals focused on low carbon economic growth. In particular:

- The UK and Welsh Government recognises the importance of decarbonisation to ensure economic growth is sustainable;
- There is a clear need to move towards renewable energy sources to increase efficiency and reduce costs, and for the public sector to exemplify this;
- Strategic imperatives to foster innovation and entrepreneurialism in high-value R&D-based opportunities;
- The creation of high-quality jobs is a clear link through all policy levels, as is a desire to provide training and development solutions to upskill existing workers.

The overall cohesion of strategic drivers supports the rationale of developing these projects as a programme. Moreover, the catalysing effect of these synergistic projects is anticipated to deliver exponential benefits, developing a base of expertise in a critical field that brings together research and industrial applications with the physical infrastructure that will generate inward investment and start-ups, support the sustainability of indigenous businesses and create a supporting network of training and job opportunities in a talent pipeline. The vision is that collectively, these projects will establish Neath Port Talbot and the region as an ecosystem delivering a diversified and sustainable cluster for innovative low carbon growth.

1.1.5 SILCG programme alignment with the SBCD portfolio

The approved overarching SBCD Portfolio business case provides the principal strategic driver for the SILCG programme and its associated business case, positioning the SILCG as a key contributor to the Swansea Bay City Deal as follows:

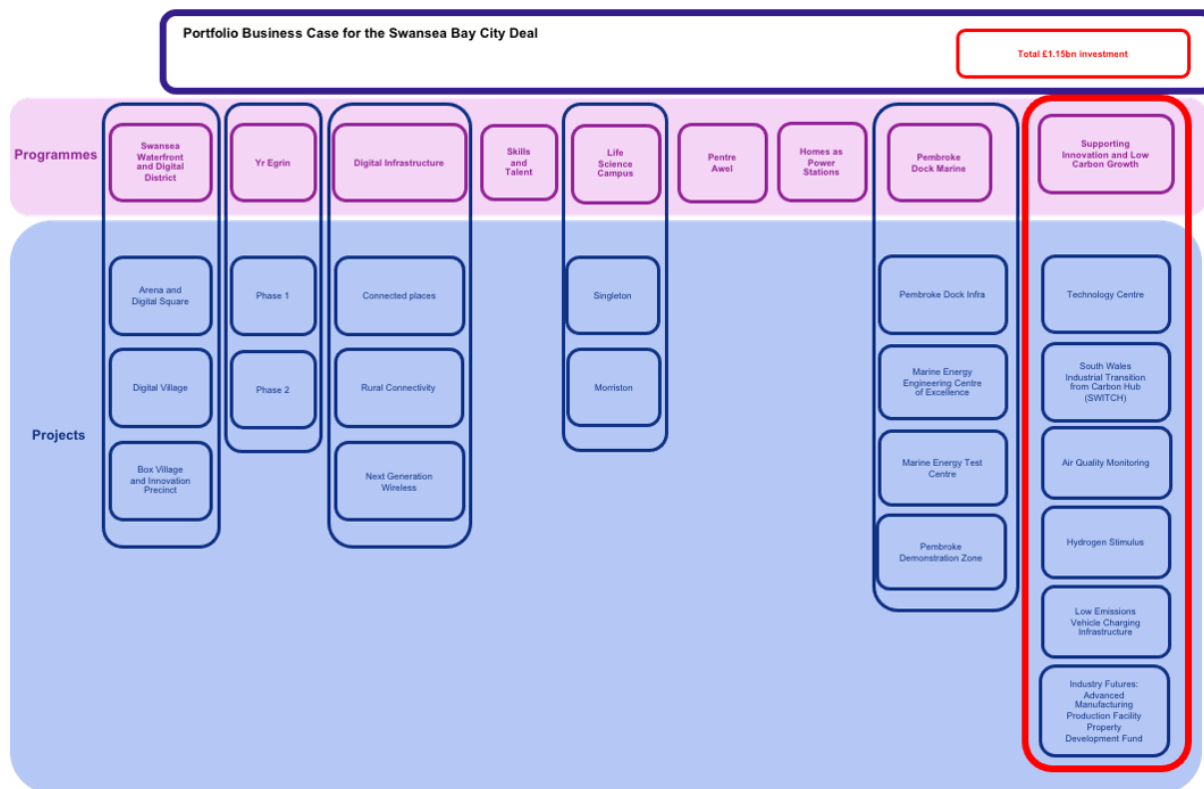


Figure 1.1: Positioning of SILCG in the SBCE

In 2019, the SBCE portfolio also recognised the climate change emergency and the need to focus on the reduction in carbon emissions.

Delivering the aspirations of the Swansea Bay City Deal Portfolio requires positive action to deliver investments in each of the four key themes. The SILCG Programme – the second largest in terms of City Deal investment – will directly deliver against the strategic themes of Energy and Smart Manufacturing as well as contributing to the wider aspirations of the Economic Acceleration theme. This, alongside clearly aligned policy drivers at UK, national, regional and local / organisational levels provide a strong foundation and rationale for the SILCG programme of investment.

1.2 The Case for Change

The Case for Change follows HM Treasury and Welsh Government’s Better Business Cases guidance, establishing a robust case for change with a clear understanding of:

- What we are seeking to achieve – the Investment Objectives
- What is currently happening – the Existing Arrangements
- What is required to close the gap between what is happening now (Existing Arrangements) and what we are seeking to achieve (Investment Objectives) - Business Needs

This section sets out the rationale for the project based on need.

1.2.1 Investment objectives

Investment Objectives form a key element of the 'Case for Change' section of the Strategic Case. The Investment Objectives describe what the delivery organisation, partners and key stakeholders wish to achieve in terms of targeted outcomes. The SILCG Investment Objectives describe the expected outcomes of the programme and are SMART and address the five key reasons for investment:

- Improving economy
- Improving efficiency
- Improving effectiveness
- Statutory compliance
- Re-procurement

SMART measures for each of the SILCG Programme Investment Objectives enable the measurement of the success of the programme and its contribution to the SBCD Portfolio.

Table 1.5 Investment objectives

Theme	Investment objective	Measures
<p>Economic performance</p>	<p>1. To create 1,320 high value added jobs aligned to the green economy through creating the right environment for a resilient, diverse and sustainable regional economy by 2033.</p>	<p>Number of jobs created and safeguarded Number of specialist facilities created Ratio of jobs to capital investment Diversification success rates On shoring opportunities delivered</p>
	<p>2. To increase the region's GVA by approximately £93m by 2033 through supporting innovation and new product development in science, technology and manufacturing sectors - strengthening industry, academia and government collaboration.</p>	<p>Local GVA uplift Measures of new technology developed / commercialisation Examples of testing, proof of concept and scaling opportunities. Number of new innovative products and processes successfully scaled up and commercialised Examples of industry, academia and government collaboration Facilitating collaboration by providing suitable premises:</p> <ul style="list-style-type: none"> - Additional floor space created to meet demand for innovation companies - Numbers of SMEs set up in collaborative facilities
	<p>3. To secure over £11m in additional investment from public and private sources, and approximately £40m (within 5 years) additional leverage from public and private research funding by 2033</p>	<p>Private sector investment leverage Public research investment Private research investment</p>

Theme	Investment objective	Measures
Environmental performance	4. To support innovation to influence a shift in the use of high CO2 energy usage to low CO2 energy usage in economic activities (n (industry, commercial buildings and transport) by 2033.	Levels of carbon emissions from industrial processes reduced Creation of low carbon and energy positive commercial buildings Developed regional charging strategy Increased LEV vehicle charging points Reduction in CO2 per mile travelled in the region Increase in low carbon public sector vehicles Identification of key regional sources of pollution from industry, commercial buildings and transport Improved air quality

It needs to be noted that the above SILCG Investment Objectives are economic and environmental which support the delivery of the current economic portfolio level Investment Objectives of the SBCD portfolio.

1.2.2 Existing arrangements

In order to consider the added value of the SILCG programme, the evidence base for change and the impact of the programme, this section describes the current situation in terms of:

1. Swansea Bay City Region economy
2. Decarbonisation and legislative requirements
3. Manufacturing
4. RD&I environment

1.2.2.1 Swansea Bay City Region economy

The Swansea Bay City Region (SBCR) is a critical driver for the Welsh economy, with a population of 688,000, supporting 302,000 jobs and 22,000 businesses. Figure 1.4 below shows regional productivity per hour is underperforming compared to the UK

average and the Cardiff Capital region over the past two decades³⁶. In 2015, GVA per employee was 74% of the UK average³⁷, down from 77% in 2010 and 90% in 1981³⁸. Only 71% of the working age population is classed as economically active compared to 76% for the UK as a whole³⁹. Skill levels in the region compare poorly to other regions of Wales and the UK, with fewer people with high levels qualifications and many with none at all⁴⁰ and reliance on the larger foundational industries in the region to support the regional economy and provide high value jobs.

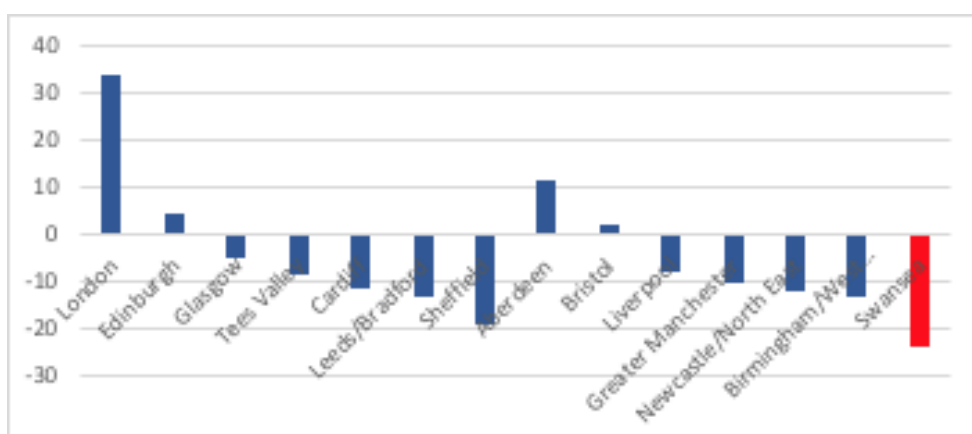


Figure 1.4 – SBCR productivity per hour relative to UK average (2016)

1.2.2.2 Decarbonisation and legislative requirements

This section describes the current situation in relation to greenhouse gas (GHG) emissions in the region, examines key contributors (vehicles, buildings and industry) and their measurement using Air Quality Monitoring (AQM).

Current GHG emissions

2019 legislation requires net zero GHGs in the UK by 2050⁴¹. Six major GHGs are identified in the Climate Change Act, as shown in Figure 1.5.

³⁶ <https://www.walesonline.co.uk/business/business-news/shocking-economic-figures-wales-regions-14260311>

³⁷ Swansea Bay City Region City Deal Heads of Terms

³⁸ Swansea Bay City Region Economic Regeneration Strategy, 2013-2030

³⁹ Data from 2010. Source: Swansea Bay City Region Economic Regeneration Strategy 2013-2030

⁴⁰ Swansea Bay City Region: A City Deal 2016-2035, The Internet Coast

⁴¹ <https://www.legislation.gov.uk/ukxi/2019/1056/contents/made>

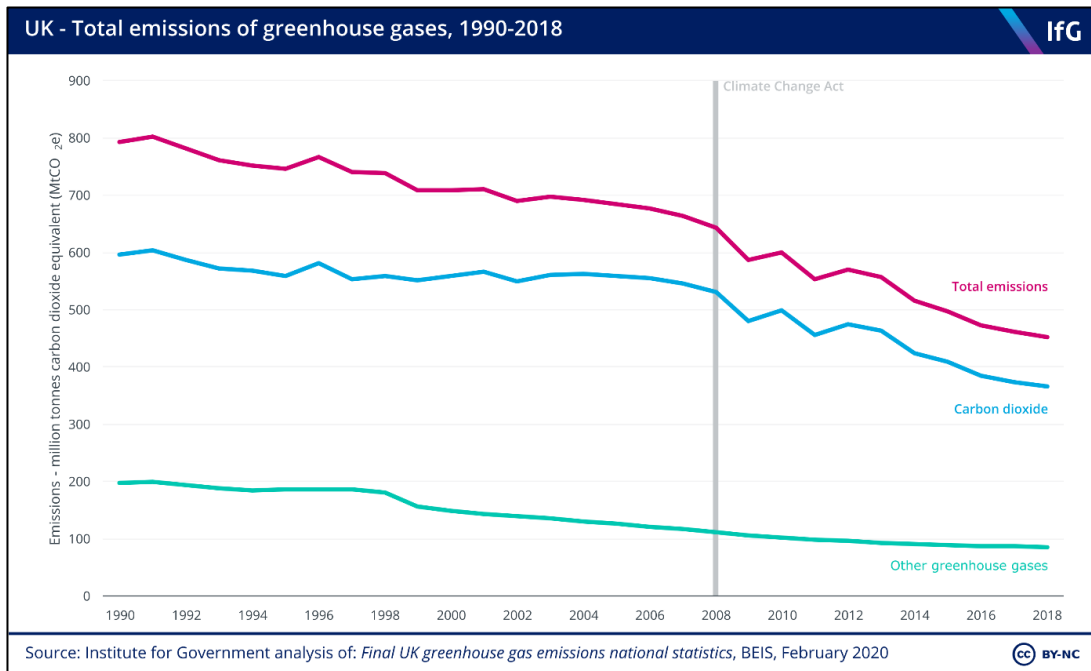


Figure 1.5: UK total emissions of greenhouse gases⁴²

The Environment (Wales) Act 2016 requires GHG emissions in Wales to reduce by at least 80% for 2050 against the 1990 baseline, with a system of interim emission targets and carbon budgets. In 2019, Wales accepted the Committee on Climate Change (CCC) recommendation for a 95% reduction in GHG emissions by 2050 with an ambition to reach net-zero⁴³. In 2020, Welsh Government has since accepted further recommendations made by the Climate Change Committee in a report to Welsh Ministers in December 2020, and will prepare an action plan in 2021 to achieve net zero emissions by 2050⁴⁴.

As shown in Figure 1.6, Wales has a unique GHG emissions profile, driven by a range of factors, including a high share of the UK industry and manufacturing.

⁴² <https://www.instituteforgovernment.org.uk/explainers/net-zero-target#references>

⁴³ <https://gov.wales/wales-accepts-committee-climate-change-95-emissions-reduction-target>

⁴⁴ <https://gov.wales/wales-commits-net-zero-2050-sets-out-ambitions-get-there-sooner>

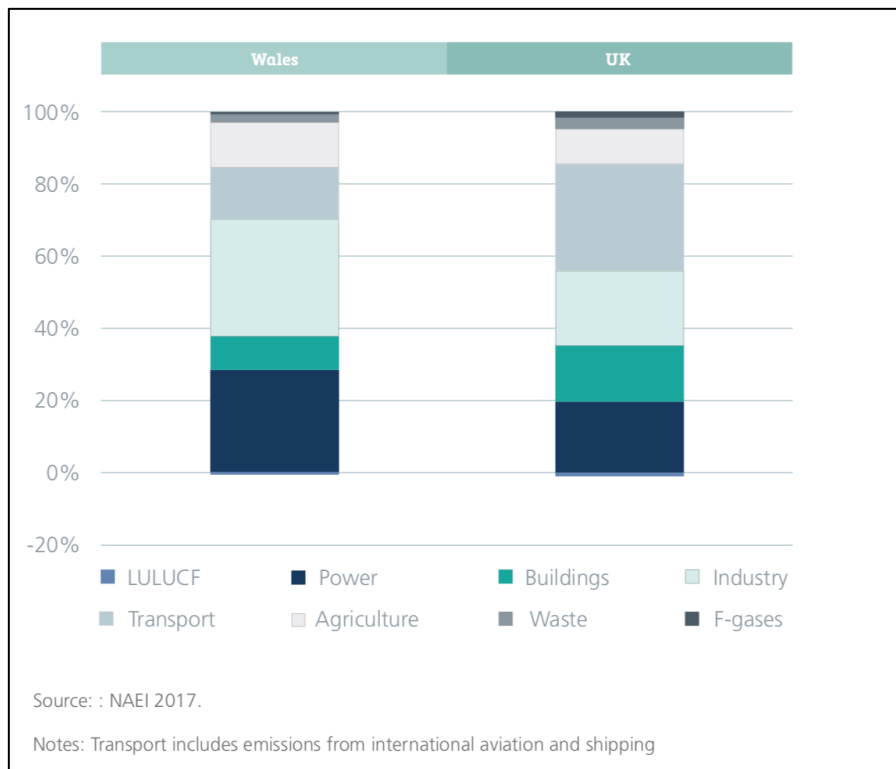


Figure 1.6: Sectoral shares of emissions in Wales and the UK (2015)⁴⁵

The UK is one of the biggest net importers of CO₂ emissions per head⁴⁶ – benefiting from products and ‘offshoring’ industry that has generated emissions elsewhere in the world, from countries with lower labour costs and less stringent pollution regulations. China is the biggest importer of emissions to the UK⁴⁷.

In Wales, production and consumption emissions must be reported at the end of each budgetary period to ensure global responsibility⁹.

Vehicles

Two key low emission vehicle technologies are becoming established:

- Battery electric vehicles – cheap to charge, readily available, supported by a variable level of charging infrastructure and ability to charge at home;
- Hydrogen fuel vehicles – can travel longer distances between fuelling and refuel in approximately 5 mins. Hydrogen clusters exist in Tokyo, California, parts of Germany and Benelux countries. In the UK, clusters are emerging in London,

⁴⁵ <https://gov.wales/sites/default/files/publications/2019-06/industry-sector-emission-pathway-factsheet.pdf>

⁴⁶ <https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/compendium/economicreview/october2019/thedecouplingofeconomicgrowthfromcarbonemissionsukevidence>

⁴⁷ <https://www.ons.gov.uk/news/news/importedemissionsincreaseenvironmentalimpactofukeconomy>

Aberdeen, Birmingham and Liverpool/Manchester, including hydrogen powered passenger cars, vans and buses.

The UK Government's Ten Point Plan for a Green Industrial Revolution details the end of sale of new petrol and diesel cars and vans from 2030. In addition, the Welsh Government's ambition is for the public sector to be carbon neutral by 2030. However, the expected increase in demand required to meet these targets cannot be met. For electric vehicles:

- The number of rapid chargers (43+kW) located near the major road network in the UK needs to increase by 2.5 times by 2030 to meet charging requirements⁴⁸
- The number of fast chargers (22kW) for 'top-up' charging needs to increase ten-fold⁴⁸
- Wales has proportionately fewer chargers than the rest of the UK (3.32% of UK total)⁴⁸
- Demand for public charge points will increase as home charging may not be feasible for certain residential properties.

Worldwide, hydrogen vehicle use is very limited but increasing – approximately 50,000 were in use by the end of 2019. Europe has around 1,000 hydrogen passenger vehicles and an additional 80 buses; although the sector is growing rapidly, with plans for deployment of over 1,000 hydrogen buses over the next three years as vehicle prices fall.

The Welsh Government has recently published its baseline report on hydrogen developments in Wales⁴⁹.

There are 20 hydrogen refuelling points operating in the UK, two located in Wales – one run by the University of South Wales at the Hydrogen Centre on Baglan Energy Park. This was established in 2009 and is the longest running operational hydrogen refuelling station in the UK, operated on a non-commercial basis.

Numbers of public sector low emission vehicles are low, due to cost, lack of available charging infrastructure and limited understanding of fleet suitability to move to low emission vehicles, despite the ambition to achieve carbon neutrality. Natural Resources Wales (NRW)⁵⁰ – a Welsh Government Sponsored Body – has

⁴⁸ Plugging the Gap: An Assessment of Future Demand for Britain's Electric Vehicle Public Charging Network

⁴⁹ <https://gov.wales/sites/default/files/consultations/2021-01/baselining-report-hydrogen-development-in-wales.pdf>

⁵⁰ <https://naturalresources.wales/?lang=en>

demonstrated it could save up to 27% emissions from its fleet and deliver a 5% cost saving through the use of existing low emission technologies¹².

Transport emissions in Wales have remained steady over recent years, as vehicle efficiency has improved, although this has been counteracted by increased travel.

Buildings

Energy demand for buildings creates direct emissions from fossil fuel heating and electricity related emissions from lighting, use of appliances and electric heating. Residential buildings represent the majority of building emissions. The business sector contributes 10% and the public sector, 8%. 96% of building emissions are carbon dioxide.

The Homes as Power Stations (HAPS) project is co-ordinated across the City Region to tackle fuel poverty and decarbonise the regional economy, focused on embedding energy-saving technologies to thousands of homes as part of a smart, low carbon new-build and retrofit programme for residential builds. There is currently no similar programme for commercial buildings.

Commercial property infrastructure

There is currently a well evidenced shortage of high quality, flexible commercial property in the region, demonstrated by:

- Two Welsh Government managed ERDF funded property development funds which are fully committed
- The recently published Commercial Property: Market Analysis and Potential Interventions report⁵¹ confirmed a lack of commercial property to support economic growth in South Wales
- Research supporting the Port Talbot Waterfront Enterprise Zone⁵² strategic plan which examined the 'demand perspective' and evidence of demand and proposed a number of 'potential property interventions' such as a Property Development Fund and commercial and industrial property investments.

The Neath Port Talbot Economic Development team has a 'live demand list' (See Annex 1.2) of companies seeking appropriate commercial property in the area.

⁵¹ <https://gov.wales/commercial-property-market-analysis-and-potential-interventions>

⁵² independent report undertaken by JLL on behalf of the Welsh Government, published in September 2016

Industry

Industrial energy and processing, particularly iron and steel production and petroleum refining are key GHG contributors (see figure 1.6) – predominantly carbon dioxide (95.8%). Port Talbot steelworks represented 50% of Welsh industrial emissions and 16% of total Welsh emissions in 2015 and South Wales is the second largest industrial cluster for emissions within the UK⁵³.

Integrated steelworks using Blast Furnace – Basic Oxygen Steelmaking accounts for 82% of the steel production within the UK, including the Tata Steel site in Port Talbot, with the remainder using Electric Arc Furnace⁵⁴. Blast furnaces require carbon-based raw materials as a reductant and energy source, dominated by coal and coke (77.8%). Iron making accounts for the largest share of direct emissions (1.1 - 1.8 tonne CO₂/tonne hot rolled coil from blast furnace)⁵⁴ with indirect emissions from generation of electricity associated with the process. Overall, integrated steel plants create around 2.2 tonnes of CO₂ per tonne of steel⁵⁴.



Figure 1.7: Location of large point-source industrial CO₂ emissions in Wales 2015

Air quality monitoring

Local authority Air Quality Action Plans (AQAP) aim to improve air quality and focus resources on priority areas. AQM takes place through several fixed 'continuous monitoring sites' which provide high quality data but are expensive and resource

⁵³ <https://idric.org>

⁵⁴ <https://www.gov.uk/government/publications/industrial-decarbonisation-and-energy-efficiency-roadmaps-to-2050>

intensive to operate. *Current* accredited low-cost options available (approved by DEFRA) only monitor for a limited number of contaminants.

Energy production

The SBCR has conventional and renewable energy production assets – Neath Port Talbot is the local authority area with the highest total renewable energy capacity (358 MW) and the highest level of renewable energy capacity at an estimated 1122Gwh, including:

- Marine Energy: e.g. the South Pembrokeshire Demonstration Zone
- Wind Power Generation (region-wide)
- Solar Power Systems (e.g. Saron/Ammanford and Baglan)
- Fresh Water Micro Generation systems
- Over £1.5bn of biomass projects in Port Talbot and Milford Haven
- Pembroke Power Station (2000MW – sufficient electricity for 1 million homes)
- The LNG plants (South Hook and Dragon) meeting circa 20-25% of the UK's needs plus the refining capacity at Valero

While fossil fuel power stations create carbon dioxide emissions, renewable energy is intermittent and demand does not always match supply varying considerably by time of day and season.

As shown in Figure 1.8, only 25% of all the electricity generated in Wales in 2018 was from renewable sources. Wales generates twice as much electricity as it consumes, the remainder being exported to other parts in the UK and the wider European electricity network⁵⁵.

The creation of energy from fossil fuel power stations leads to carbon dioxide emissions and the demand for electricity is expected to continue to grow over time with increasing use of low emission vehicles and electric heating for buildings.

⁵⁵ <https://gov.wales/sites/default/files/publications/2019-10/energy-generation-in-wales-2018.pdf>

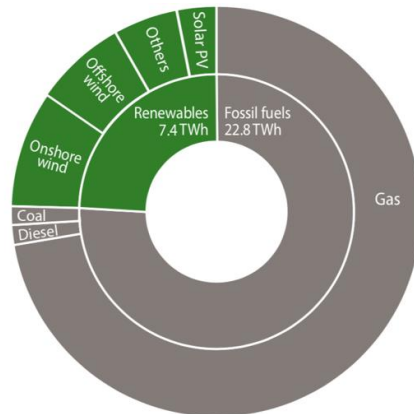


Figure 1.8: Electricity generation in Wales by source (2018)⁵⁵

1.2.2.3 Manufacturing

MAKE UK, which represents the UK manufacturing community, reported on the current state of the manufacturing sector in June 2020. It stated that manufacturing has continually reinvented itself in order to adapt to the many factors and forces which drive change (source: A manufacturing future for Wales: a framework for action)⁵⁶.

One of the main manufacturing opportunities in South Wales is in the established steel and metals industries. This section therefore examines the extent of this industry in the region, the impact on the regional and UK economy and describes smart manufacturing approaches being pursued in relation to these industries.

There is a diverse range of steel and metal producers, suppliers and customers within the SBCR, critical to the UK, national, regional and local economies.

The UK steel industry directly contributes £1.6 billion to the economy, employs 31,900 people in production facilities, downstream processing and rolling and distribution businesses and supports 52,300 jobs through its supply chains and local communities⁵⁷ contributing £3.9 billion. The steel and metals industry in South Wales is the foundation of this economy, comprising:

- Tata Steel – the largest steel producer in the UK – with four facilities in Wales, employing over 5,000 people in the SBCR at the Port Talbot integrated steel works and steel packaging operation within Llanelli. Every job at Tata Steel supports another 1.22 within the region⁵⁸
- Celsa Steel and Liberty Steel with large operations in Cardiff and Newport

⁵⁶ <https://gov.wales/sites/default/files/consultations/2020-09/manufacturing-future-wales-consultation-document.pdf>

⁵⁷ <https://www.makeuk.org/insights/publications/new-deal-for-steel>

⁵⁸ <https://wer.cardiffuniversitypress.org/articles/abstract/10.18573/j.2012.10440/>

- Internationally recognised metal producers and SMEs: Timet, a titanium manufacturer supplying one-fifth of the world’s titanium; Sandvik Osprey, a global leader in the production of gas atomised metal powders; Wall Colmonoy & Weartech, producers of cobalt-based alloys; Vale, one of the largest refineries in Europe producing high purity nickel and subproducts; and Darlow Lloyd, specialising in waste management and asset recycling

Figure 1.9 shows the associated average salary in the steel industry is 28% higher than the national average and 46% higher in Wales and Yorkshire and Humberside – areas of high socio-economic deprivation.

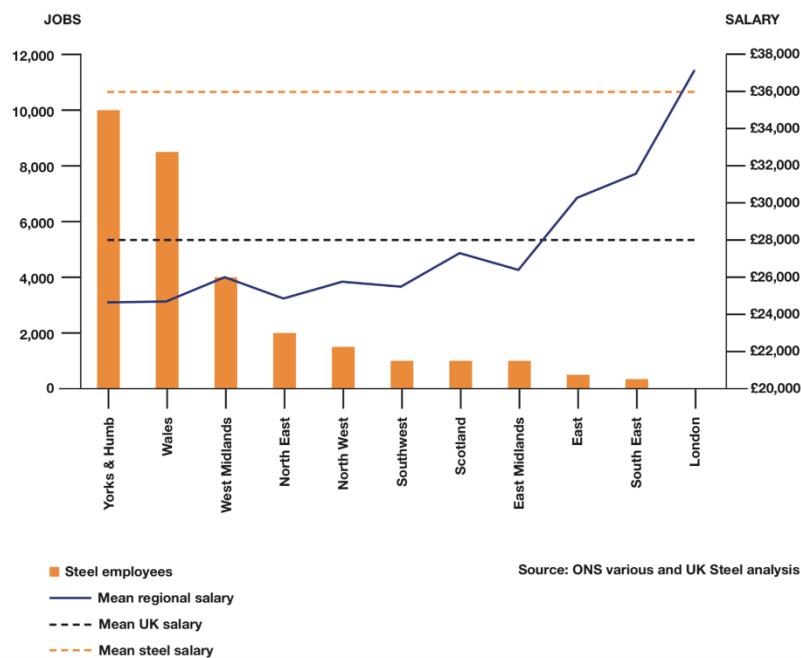


Figure 1.9: UK steel employment by region, average regional and steel salary⁵⁷

There are six steel producing companies in the UK with associated downstream processing, rolling and distribution businesses, producing 7.3 million tonnes of crude steel which was further processed into a finished product, such as strip, plate and wire rod.

Steel is endlessly recyclable, versatile, cost effective, ubiquitous and critical to a diverse industrial economy, with supply chain linkages into major downstream manufacturing sectors such as automotive, aerospace, rail, construction, energy, packaging and machinery.

Market sectors are transforming to improve performance and reduce carbon emissions. UK steel producers are striving to develop and supply higher-value steel –

for example, the construction sector is developing low-impact energy efficient housing and the automotive sector is reducing vehicle weight and moving towards electrification.

UK finished steel demand forecast was 11 million tonnes in 2030⁵⁹, split by market sector, with construction and automotive being dominant areas (see Figure 1.10).

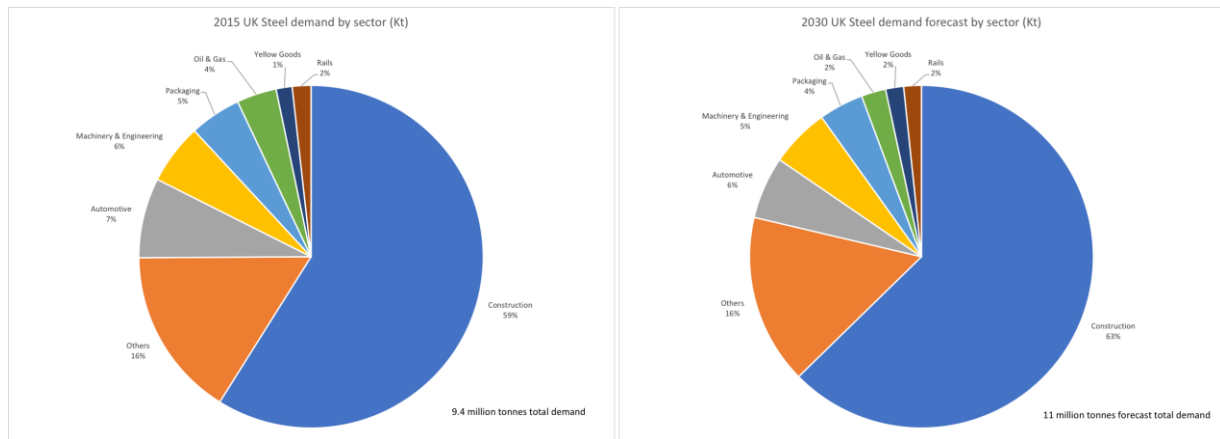
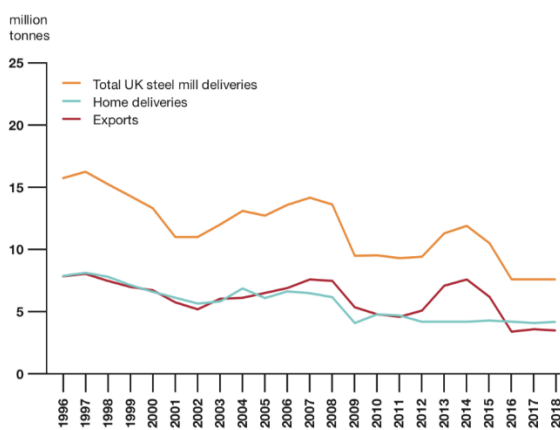


Figure 1.10: Forecast finished UK steel demand by sector⁵⁹

Note: 'Others' includes appliances, light and commercial vehicles, ships, rolling stock, process equipment and internal combustion engines

While UK demand for steel continues to increase, there has been a steady decline in home and export deliveries (see Figure 1.11 below).

UK steel mill home and export deliveries 1996 - 2018



UK steel requirement 2010 - 2018

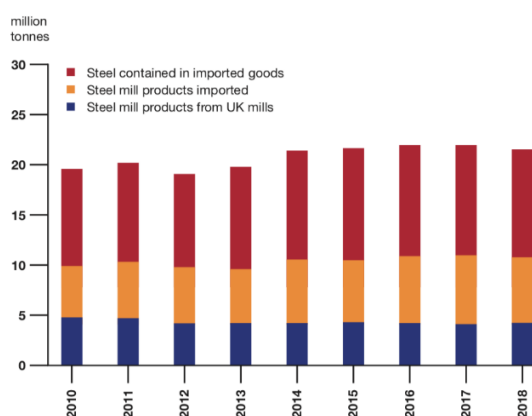


Figure 1.11: UK steel mill product supply into the UK market and level of exports⁶⁰

⁵⁹ <https://www.gov.uk/government/publications/uk-steel-industry-future-market-opportunities>

⁶⁰ <https://www.makeuk.org/insights/publications/uk-steel-key-statistics-guide-2019>

1.2.2.4 RD&I environment

RD&I clusters exist around Baglan Energy Park, Harbourside, Swansea University Science and Innovation Bay Campus and University of Wales Trinity St David Waterfront Innovation Quarter Campus in SA1, Swansea. The region has a growing number of RD&I initiatives and Centres of Excellence led by the local universities - Swansea (SU), Cardiff (CU), South Wales (USW) and Trinity St David (UWTSD), including:

- Hydrogen Research and Demonstration Centre, Baglan Energy Park (USW)
- Flexible Integrated Energy Systems FLEXIS (CU)
- Sustainable Product Engineering Centre for Functional Innovative Coatings SPECIFIC (SU)
- Steel and Metals Institute SaMI (SU)
- Advanced imaging of Materials Centre AIM (SU)
- Energy Safety Research Institute ESRI (SU)
- Innovative Manufacturing Processing and Numerical Techniques IMPACT (SU)
- TWI Technology Centre, Harbourside (Private sector)
- Gas Turbine Research Centre, Margam (CU)
- Wales Centre for Advanced Batch Manufacture (UWTSD)
- Construction Wales Innovation Centre CWIC (UWTSD)

The existing research development and innovation landscape is associated with developing manufacturing capability for next generation low carbon steel products and energy systems and applications, in addition to innovation in a number of other sectors including advanced manufacturing, ICT, hydrogen, life-science, medical engineering and transport.

In describing the research landscape, the concept of Technology Readiness Levels (TRLs)⁶¹, describes maturity of research in the translation of science into a new commercially proven product and process.

Across the UK, a number of research development and technology institutes work closely with the steel market sectors including:

- Advanced Materials Research Centre (AMRC) in Sheffield (part of the High Value Manufacturing Catapult) with a focus on close to market (high TRL) advanced manufacturing using multiple materials. It also has a dedicated aerospace facility in North Wales working with Airbus

⁶¹ originally a concept developed by NASA and described in Annex 1.3

- Henry Royce Institute centred at the University of Manchester and Sheffield specialising in early-stage advanced materials research across multiple sectors such as aerospace and infrastructure
- The Warwick Manufacturing Group (also part of the High Value Manufacturing Catapult) and the embedded Advanced Steel Research Centre focusing on the application of steel, aluminium and advanced composites in automotive and novel sensors used in challenging industrial environments to gather data and improve materials processing.

Several focused metals related research centres have been established in Swansea University:

- **Sustainable Product Engineering Centre for Innovative Functional Industrial Coatings (SPECIFIC)** – an academic and industrial applied research consortium with more than 50 partners from academia, industry, and government and an innovation and knowledge centre at Swansea University and facilities at the Baglan Energy Park in Port Talbot, which:
 - provides a strong linkage into the construction sector researching development of functional coated steel and glass products from fundamental science to full-scale building demonstrations, to reduce energy consumption and carbon emission in buildings
 - has successfully created a focused research and innovation ecosystem, through the co-location of industrial and academic experts with equipment capability that enables the transition from fundamental research
- **Materials Advanced Characterisation Centre (MACH)** – Based at Swansea University Bay Campus, enabling fundamental research (TRL 1-3) into developing next generation alloys for industrial applications and 3D printing through small scale rapid alloy prototyping (RAP) and computer simulations
- **Steel and Metals Institute (SaMI)** – funded through private and public research projects and collaborating with steel and metal producers, suppliers and end users with industrial research staff co-located within the facility – SaMI includes equipment to simulate through chain process for steel alloy development, with capability to test and analyse a new product's characteristics and integrity. It provides an initial level of capability to simulate and test in extreme environments for low carbon steel making research and enabling fundamental alloy development research (TRL 1-3) to be proven at pilot scale (TRL 4-7) before being trialled within industry. SaMI is temporarily housed at Swansea University Singleton campus in a building that requires significant investment to be fit for purpose

The UK commitment to reduce carbon emissions is driving research to reduce carbon emissions, centred around energy systems and applications, including carbon capture utilisation and storage (CCUS):

- **Hydrogen Centre**, led by the University of South Wales, is the first of its kind in Wales and located at Baglan Energy Park in Port Talbot. The aim of the centre is to demonstrate the viability of producing hydrogen from a range of renewable energy sources and the evaluation of using hydrogen as a medium of energy storage
- The **Energy Safety Research Institute (ESRI)** housed at Swansea University bay campus focusing on new technological solutions for energy, with research including next generation energy distribution and the creation of high value products for industrial carbon emissions
- **Flexible Integrated Energy Systems (FLEXIS)** – a consortium of academic and industrial partners developing flexible energy systems, led by Cardiff University with Swansea University and the University of South Wales as lead partners. FLEXIS models energy production, usage/flows and deployment of data to explore improved efficiency, storage and alternative fuel use. Modelling and capturing carbon emissions determine net emissions reduction and assess potential implementation of carbon capture and CO₂ storage techniques⁶². A demonstration area stretches from Tata Steel to Swansea University's Bay Campus, the Swansea SA1 development, incorporating Neath (Figure 1.12)



Figure 1.12 FLEXIS demonstration area

- In 2020 the **South Wales Industrial Cluster (SWIC)**⁶³ formed. SWIC brings together a range of the key industrial groups across the region spanning metals, petrochemicals and other energy intensive materials processes with a mission to support industrial decarbonisation. SWIC has formed with initial support from

⁶² <http://www.flexis.wales/demonstration-area/>

⁶³ <https://www.swic.cymru/>

FLEXIS and is shaping both a collaborative R and I programme and industrial deployment options ranging from hydrogen fuel switching to carbon capture and conversion. The region's strong industrial base is catalysing an emerging research and Innovation sector. This shift is demonstrated through Swansea's higher education institutions' investment priorities:

- Swansea University's £450m Science and Innovation Bay Campus, opened in September 2015 and the largest educational investment in Europe in recent years
- University of Wales Trinity St David's investment of £300m in a 'Waterfront Innovation Quarter Campus' at Swansea's SA1 Waterfront
- A growing range of research and development initiatives in the region, building on its experience in high quality steel production. Some facilities are located at the universities others are clustered in the Port Talbot Waterfront Enterprise Zone (PTWEZ), established in March 2016 as one of eight officially designated Enterprise Zones in Wales and shown in Figure 1.13 below

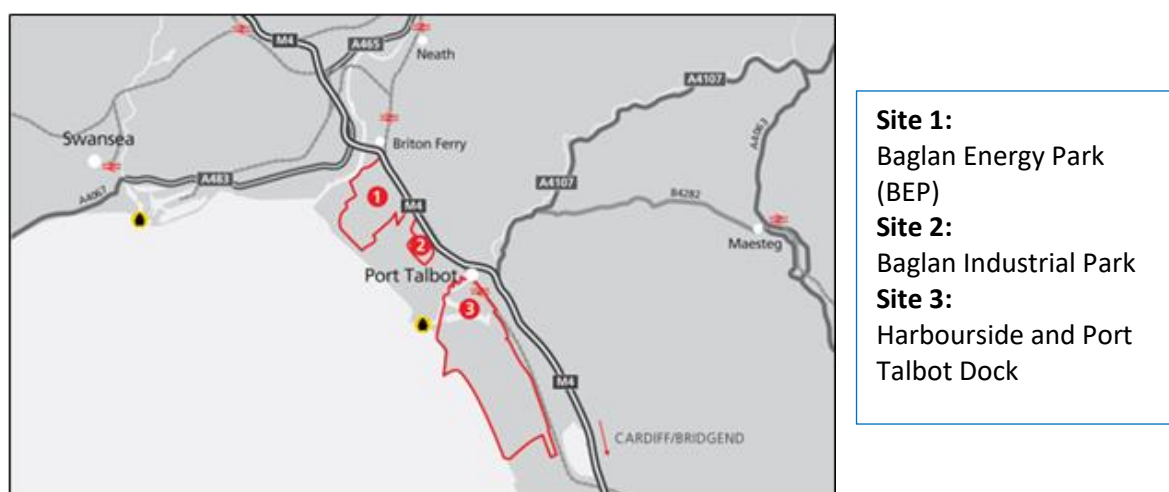


Figure 1.13: Port Talbot Waterfront Enterprise Zone

Across these areas, innovation clusters are emerging, including the research centres detailed above, creating high value jobs (for example at the Harbourside R&D Village tenant-base where all the jobs are paid more than the Welsh average, and 90% are above the UK average)⁶⁴.

- **Baglan Energy Park:** Home to Baglan Bay Innovation Centre, a 39,000 sq ft facility built over four floors, that provides 32 incubator units and communal meeting rooms for innovative, high-tech and sustainable technology led businesses to grow and is already 97% let. A range of high-profile

⁶⁴ Based on primary data gathered by NPTCBC

companies including GE Energy, Hi Lex Cable Systems and Montagne Jeunesse are also located on the site. In addition, the Renewable Hydrogen Research and Demonstration Centre and SPECIFIC.

- **Harbourside R&D Village:** Fully let and includes leading global innovators such as Tata Steel and TWI UK Ltd. Also, land has been identified for a proposed new education campus planned by Neath Port Talbot Group of Colleges.

1.2.3 Business needs

The Business Needs represent the gap between the desired outcomes (Investment Objectives) and the Existing Arrangements expressed as problems with the status quo and opportunities for change.

To reflect the problems and opportunities associated with the Existing Arrangements, this section is structured against the headings from the Existing Arrangements section:

1. Swansea Bay City Region economy
2. Decarbonisation and legislative requirements
3. Manufacturing
4. RD&I environment

1.2.3.1 Swansea Bay City Region economy

The Welsh Government Economic Action Plan identifies increasing productivity and diversification as key to economic growth. The steel industry is well established in the SBCR and a major contributor to GVA, jobs and the local economy, but overall, the productivity of the region is underperforming, with GVA at 74% of the UK average and decreasing over time.

The region needs targeted investment to arrest the decline in economic performance. The development of the region's research, development and innovation sectors to develop clustering opportunities is critical to future proofing the economy and harnessing the opportunities of the Green Industrial Revolution. A key opportunity is to build on the existing industry and steel production in the region, but in doing so, diversify the industrial and manufacturing base and support the associated supply chain. Doing more of the same will not work. – there is a need to drive change, meet modern demands and standards, including increasingly stringent environmental standards, to cement the region's future for steel expertise, RD&I, energy and renewables sectors and to create and safeguard jobs.

Productivity gains and boosting the region's economic competitiveness can be achieved through existing companies, start-up companies and inward investment. Key growth sectors are energy, renewables, advanced manufacturing, high value engineering, ICT, financial and business services, and tourism.

Overall, there is an over reliance on the foundational industries to support the economy and provide high value jobs. Economic diversity is increasingly important as are skills – there are too few people with high-level qualifications and many with none at all – all of which contributes to a lack of innovators and entrepreneurs in the region. There is an evidenced need for appropriate infrastructure to support economic growth and economic diversification.

Economic business needs are to:

- Diversify the economy (industrial and manufacturing base), increase productivity and stimulate recovery by supporting the steel and metals industry and the decarbonisation of industry
- Support the supply chain associated with the industrial and manufacturing base
- Develop skills in the region to support existing and developing industry

1.2.3.2 Decarbonisation and legislative requirements

GHG emissions

UK and Welsh Governments have ambitious GHG emissions targets. Achieving them regionally and nationally will be a significant challenge. The SBCR already has a significant proportion of renewable energy sources; however, meeting net zero emissions by 2050 requires acceleration of the transition to low carbon energy production while de-coupling economic growth (and the heavy industries present in the SBCR) from increased carbon emissions.

Government is committed to accounting for all carbon – including 'imported' or 'off-shored' carbon emissions – so 'on-shoring' of industry and its emissions is desirable, as this supports the economy and enables greater control over overall emissions.

Business needs in relation to GHGs are:

- To meet net zero emissions target by 2050; de-coupling economic growth from carbon emissions in the region; and
- Reduce importing of CO₂ – diversify the economy and bring economic activity onshore, where possible to improve air quality.

Vehicles

Energy demand for transport remains high and incentives are insufficient to challenge the status quo – Internal Combustion Engine (ICE) vehicles are too convenient, easy and cheap compared to their low-carbon equivalents. Addressing this requires a catalyst for change. The Welsh Government’s ambition is for the public sector to be a leader in implementing low carbon technologies. The public sector has an opportunity to provide the foundations for change by prioritising low-carbon vehicles, for its fleet.

This requires investment in extending vehicle charging infrastructure in SBCR and supporting the ‘proof of concept’ of promising new low carbon technologies, such as hydrogen powered vehicles, which have significant potential benefits (such as quicker ‘charging’ and a much greater range) and could complement more established electric vehicle technologies.

Business needs in relation to vehicles are to:

- Reduce energy demand for transport by providing alternative fuel sources
- Reduce emissions from transport – public and private vehicles by encouraging the use of low carbon transport by using the public sector to lead by example in reduction of emissions for public vehicles
- Increase capacity for low emission vehicle charging across the region through infrastructure coordination
- Demonstrate the commercial viability of the renewable generation of hydrogen and build on its use as an alternative to electric vehicles

Buildings

Buildings are major sources of GHGs – the largest emitters being private dwellings. However, given that the HAPS project within the SBCR portfolio is already addressing low carbon domestic properties, there is also a need to consider the significant (18%) emissions from commercial and public sector properties and seek opportunities to reduce energy demand from these buildings and improve design in commercial buildings.

Again, the public sector can act as a catalyst for change by being an early adopter of new technologies and where possible, incentivising incorporation of low-carbon technologies in new build commercial buildings in the SBCR.

Business needs in relation to buildings are to:

- Reduce energy demand and improve design of commercial buildings
- Investigate low carbon technologies for commercial buildings
- Incentivise new commercial buildings to be low-carbon

Commercial property infrastructure

Public sector cuts and a lack of private sector investment in the region due to the 'cost/value gap' have led to underdevelopment of commercial property infrastructure. This lack of commercial property means that the needs of companies actively seeking appropriate property are not being met.

In addressing the cost/value gap and supporting the development of commercial property infrastructure, there is a clear opportunity to incentivise any new developments to adhere to innovative energy positive construction principles being developed by this programme.

Business needs in relation to commercial property infrastructure are to:

- Address the cost/value gap with commercial property in the region
- Incentivise development of energy positive buildings

Industry

There is a need to secure a low carbon competitive industrial base including the development of a true circular economy, and a reduction in carbon emissions.

The industry sector accounted for 29% of Welsh emissions in 2016. Industrial emissions in Wales are dominated by iron and steel production (11% of Welsh emissions in 2016), and petroleum refining (4.9%). Wider industry including manufacturing and construction (2.8%), cement, gas production and distribution, operation of machinery, minerals and mining, chemical production, paper and pulp and the manufacture and processing of food and drink also account for a significant proportion of emissions. A significant majority of industrial emissions arise from a cluster of operations in the South Wales corridor, dominated by the production of steel and oil refining.

There is a need for government, industry and academia to work together to develop the best approaches to achieve decarbonisation in the short, medium and long term. This includes consideration of technologies such as hydrogen and carbon capture utilisation and storage.

Business needs in relation to industry are to:

- Reduce energy demand in industrial processes
- Decarbonise the steel and metals processing and reduce industrial emissions
- Support applied research into alternative low carbon fuel sources and new steel making technologies, considering the global emissions impact
- Collaborative approach – government, industry and academia

Air quality monitoring

Demonstrating improvements in GHG performance requires high quality data. While some data are available for Air Quality Monitoring (AQM) they are insufficiently granular and extensive to provide an accurate picture of the status quo and potential improvements. New lower cost technology is emerging that could be deployed using existing street furniture (such as lamp posts) to increase the coverage of monitoring and measure a wider range of GHGs.

Emerging sensor technology will generate more granular local data and help to identify specific sources and level of pollutants and support the evaluation of the effectiveness of mitigation measures. Higher quality data will enable robust demonstration of improvements delivered by the SILCG programme, as the projects are delivered. A clear business need is therefore to invest in low-cost, mobile AQM sensors to be able to satisfactorily demonstrate improvement.

Business needs in relation to air quality monitoring are to:

- Obtain real time, granular data to address air quality issues and implement mitigation measures
- Adopt emerging technologies for low-cost sensor monitoring to offer greater flexibility in location, volume of monitoring and the number of pollutants that can be monitored

Energy production

A key business need described above, is to support the transition to low-carbon transport, buildings and industry. The SILCG programme needs to promote the re-balancing of energy production from fossil fuels to low carbon, alongside low-carbon transport.

Hydrogen is set to play a major role in the decarbonisation of industry, buildings, the energy sector and transport. - however, this relies on the energy used to either create hydrogen or electrical charge being generated in a low-carbon manner.

In December 2020, the Welsh Government published its hydrogen sector consultation 'A pathway and next steps for developing the hydrogen energy sector in Wales'⁶⁵. The SILCG programme will respond to the need to develop the hydrogen sector.

⁶⁵ <https://gov.wales/developing-hydrogen-energy-sector-wales>

Business needs in relation to energy production are to:

- Rebalance energy production away from fossil fuels to low-carbon
- Ensure the security of supply of zero carbon energy for heating and fuel

1.2.3.3 Manufacturing

There is a need to develop clean growth ‘mini clusters’ and net zero industry clusters. The South Wales Industrial Cluster (SWIC) has recently been awarded funding from UKRI to develop a net zero industrial cluster in South Wales, which includes Port Talbot⁶⁶. The SILCG programme will support the delivery of the net zero industrial cluster with its interlinked programme of projects.

The UK steel industry is a major contributor to the UK economy and South Wales and the SBCR are core to that economy. Over the past 20 years, despite increasing demand for steel and steel products in the UK, UK suppliers have not been able to fully satisfy this demand (and export demand), losing market share to foreign suppliers.

Safeguarding the steel industry in the UK and SBCR therefore requires improved competitiveness – meeting customers’ evolving needs for innovative steel products. In the wider global steel market, there is strong competition for steel and metal products and the UK’s opportunity to be competitive is through innovation – creating higher quality steel and metal products; reducing costs and increasing their range of applications and reducing carbon emissions from their processing (given steel and metal production is a major source of GHG emissions, innovation in steel production and processing could provide very significant improvements to GHG emissions in the SBCR). The SBCR is well placed to drive this innovation, building on the heritage of steel production and skills in the region alongside the support available from the region’s universities and research institutions.

Developments in manufacturing will support and develop indigenous businesses – and as described above – will be delivered through research and innovation and collaboration between government, industry and academia.

Business needs in relation to manufacturing are to:

- Maintain and improve the competitiveness of the SBCR steel and metals industry
- Support industry, academia and government collaboration through applied research

⁶⁶ <https://www.ukri.org/news/ukri-announces-winners-of-industrial-cluster-competition/>

1.2.3.4 RD&I environment

There is a need to further develop the region's RD&I sectors to support economic growth and diversification, in particular in the Clean Growth sectors including energy and renewables.

The range of regional assets as detailed in the Existing Arrangements section demonstrates the potential of the region's applied research output in relation to ICT, advanced manufacturing and life sciences. The key to turning this applied research into economic growth is through commercialisation of research and spin-outs. There is a need to facilitate the spin out and product development supported by flexible commercial / laboratory and industrial premises from incubator to manufacturing at scale.

An established, cohesive and multidisciplinary research base is in place for steels and metals in the SBCR, with collaborations between government, industry and academia through Swansea University's research centres including SPECIFIC, MACH and SaMI. Their research supports the local and national steel industry to remain competitive through innovation in products and processes and seeking decarbonisation opportunities. However, these collaborations require support to thrive – they are constrained by lack of space, researchers, equipment and unsuitable infrastructure:

- Although high quality research and innovation is present within the region, the research community from which impact can be delivered is relatively small⁶⁷.
- Current applied research capability is constrained by low grade infrastructure and lack of available space for expansion
- People, including co-located industrial staff already exceeding available capacity with design layout and space impacting on the ability to collaborate effectively
- Current equipment capability insufficient to meet research needs.

Addressing these problems would improve the quality and scope of metals research and the associated output with opportunities to investigate such areas as:

- Alternative low carbon fuel sources for steelmaking
- Improve scrap segregation and utilisation while meeting quality requirements
- Use of societal waste as a fuel source in the steelmaking process
- Improve product capability through alloy development and late-stage product development, integrating approaches that will accelerate development stage

⁶⁷ https://www.hefcw.ac.uk/documents/policy_areas/research/reid-review-en.pdf

Energy research in the region taking place through the Hydrogen Centre, ESRI, FLEXIS, Baglan Bay Energy Park and Harbourside R&D Village, support low-carbon energy and can investigate opportunities including:

- Development of renewable hydrogen production, energy storage and usage in vehicles
- Next generation energy distribution
- Carbon capture utilisation and storage

The range of regional research and innovation assets demonstrates the potential of SBCR's applied research output. Turning this into productive economic activity requires research to be commercialised and spun out into new companies, which relies on strong links between academia and research through physical co-location and collaboration.

Incubation, early-laboratory and real-world living-laboratory facilities and proving factories are key components of successful innovation ecosystems around the world. Demand is increasing for these capabilities, with 30 enquires from companies within the last 12 months, requiring 12,350 m² of business space and outstrips limited supply. As of 2016, Swansea had four incubators according to official research conducted by the Department for Business, Energy and Industrial Strategy. However, with the exception of TechHub, each is either creative-industry or health-focussed and not in a position to support spin-outs and potential high-growth start-ups in the targeted areas such as energy, renewables, and smart manufacturing. In addition, co-located commercial office space and laboratory facilities are only available at the fully let R&D Village at Harbourside.

Data from the South Wales Property Development Fund (PDF) – one of two European Regional Development Funds to stimulate private sector investment – show a cost/value gap across the region of 55%. The Harbourside and Brunel Park development at the Energy Park would not have been built without public sector investment of 45% of each project's building costs, despite both projects achieving full occupancy rates. Moreover, since withdrawal of the PDF no further commercial developments of this kind have come forward.

Lack of funding for specialism and skills developments – particularly in relation to decarbonisation, which needs to be addressed in collaboration with the Skills and Talent Project within the SBCD portfolio.

This has already been recognised by UK Government with the establishment of the Green Jobs Skills Taskforce⁶⁸

There is therefore a need to meet these demands for co-located commercial office, laboratory and incubator space and continue to provide and increase numbers of appropriately skilled researchers to use them.

Business needs in relation to RD&I infrastructure are to:

- Build on strong existing RD&I initiatives fostering collaboration between government, industry and academia
- Support maintenance and growth of market share in the steel and metals industry by ensuring the UK and SBCR remain leaders in steel innovation, advancing RD&I and decarbonisation
- Address the practical needs of RD&I that support commercialisation through spinouts, high growth start ups and indigenous business growth – providing appropriate infrastructure and collaborative space for industry and academia, including flexible office/laboratory and industrial premises, with room for expansion
- Encourage private sector investment in facilities and address the market failure/cost – value gap
- Work with the Skills and Talent programme, RLSP and other skills and training providers to map skills gaps and secure funding for decarbonisation-focused development of research specialists and work-based learning to ensure there are appropriate skills to support low carbon economy and the Green Industrial Revolution.

⁶⁸ <https://www.gov.uk/government/news/uk-government-launches-taskforce-to-support-drive-for-2-million-green-jobs-by-2030>

1.2.4 Business needs summary

Table 1.6: Summary of business needs

Theme	Existing arrangements	Investment objective	Business needs
Economic performance	<ul style="list-style-type: none"> SBCR economy underperforming compared to UK: <ul style="list-style-type: none"> GVA 74% of UK average and falling 71% working age population employed (UK: 76%) Fewer people with higher level qualifications compared to other regions of Wales and the UK. Reliance on foundational industries for higher value jobs - strong steel industry and the foundation of UK steel industry. Strong and increasing demand for steel from domestic and export markets, but domestic supply reducing. 	<p>1. To create 1,320 high value added jobs aligned to the green economy through creating the right environment for a resilient, diverse and sustainable regional economy by 2033.</p>	<ul style="list-style-type: none"> Diversify the economy (industrial and manufacturing base), increase productivity and stimulate recovery by supporting the steel and metals industry. Support the supply chain associated with the industrial and manufacturing base. Develop skills in the region to support existing and developing industry, particularly working with the Skills and Talent programme to increase funding for decarbonisation-focused research specialists and work-based learning to ensure there are appropriate skills to support low carbon economy.
	<ul style="list-style-type: none"> RD&I clusters exist in the region with a growing number of initiatives. 	<p>2. To increase the region's GVA by approximately £93m by 2033 through supporting</p>	<p><u>Manufacturing:</u></p> <ul style="list-style-type: none"> Maintain and improve the competitiveness of the SBCR steel and metals industry.

Theme	Existing arrangements	Investment objective	Business needs
	<ul style="list-style-type: none"> Shortage of high quality, flexible commercial property in SBCR with demonstrated demand. 	<p>innovation and new product development in science, technology and manufacturing sectors - strengthening industry, academia and government collaboration.</p> <p>3. To secure over £11m in additional investment from public and private sources, and approximately £40m (within 5 years) additional leverage from public and private research funding by 2033</p>	<ul style="list-style-type: none"> Support industry, academia and government collaboration through applied research. <p><u>Commercial property:</u></p> <ul style="list-style-type: none"> Address the cost/value gap with commercial property in the region. Incentivise development of energy positive buildings. <p><u>RD&I infrastructure:</u></p> <ul style="list-style-type: none"> Build on existing RD&I initiatives and support maintenance and growth of market share in the steel and metals industry so the UK and SBCR remain leaders in steel innovation, advancing RD&I and decarbonisation. Address practical needs of RD&I commercialisation through spinouts, high growth start ups and indigenous business growth – providing appropriate infrastructure and collaborative space for industry and academia, including flexible office/laboratory and industrial premises, with room for expansion. Encourage private sector investment in facilities and address the market failure/cost – value gap.

Theme	Existing arrangements	Investment objective	Business needs
Environmental performance	<ul style="list-style-type: none"> • Strong legislative drivers to reduce GHGs at UK and Wales level. • Wales GHGs driven predominantly by energy generation and industry (particularly the steel industry). • High level of offshored CO₂. • Public sector desire to lead revolution in LEVs - few charging points and existing hydrogen centre. • Energy emissions from commercial buildings not being addressed. • SBCR has range of conventional and renewable energy production assets (25% from renewables, 75% fossil fuels). 	<p>4. To support innovation to influence a shift in the use of high CO₂ energy usage to low CO₂ energy usage in economic activities (industry, commercial buildings and transport) by 2033.</p>	<p><u>General:</u></p> <ul style="list-style-type: none"> • Meet net zero emissions target by 2050; de-coupling economic growth from carbon emissions in the region. • Reduce importing of CO₂– diversify the economy and bring economic activity onshore, where possible. • Improve air quality. <p><u>Industry:</u></p> <ul style="list-style-type: none"> • Reduce energy demand in industrial processes. • Decarbonise the steel and metals processing and reduce industrial emissions. • Support applied research into alternative low carbon fuel sources and new steel making technologies, considering the global emissions impact. <p><u>Energy:</u></p> <ul style="list-style-type: none"> • Rebalance energy production away from fossil fuels to low-carbon Ensure the security of supply of zero carbon energy for heating and fuel. <p><u>Vehicles:</u></p>

Theme	Existing arrangements	Investment objective	Business needs
			<ul style="list-style-type: none"> • Reduce emissions from public and private vehicles, encouraging the use of low carbon transport, using the public sector to lead by example in reduction of emissions for public vehicles. • Need to increase capacity for low emission vehicle charging across the region. • Demonstrate commercial viability of the renewable generation of hydrogen and build on its use of hydrogen as an alternative to electric vehicles. <p><u>Buildings:</u></p> <ul style="list-style-type: none"> • Reduce energy demand and improve design of commercial buildings. • Investigate low carbon technologies for commercial buildings. • Incentivise new commercial buildings to be low-carbon.

1.3 Potential Project Scope

1.3.1 Potential business scope and key service requirements

This section of the Strategic Case starts the process of considering the potential scope of the programme based on the changes required to satisfy the identified business needs and deliver the Investment Objectives (outcomes). The maximum value of the SILCG programme comes from the synergies between projects and how each project contributes to the Business Needs as detailed above.

Table 1.7 Potential scope and services

Investment Objective	Potential business scope & key service requirements
<p>IO1 – To create 1,320 high value added jobs aligned to the green economy through creating the right environment for a resilient, diverse and sustainable regional economy by 2033</p>	<ul style="list-style-type: none"> • Investment in the development of high quality, flexible, specialist commercial and industrial premises to support research, commercialisation and collaboration. • Provide infrastructure and support at each stage of the life cycle of a business to enable diversification in research, spin-outs, start-ups, growth companies and inward investment. • Develop clustering opportunities. • Establish an open access facility to work with a range of industrial partners.
<p>IO2 - To increase the region’s GVA by approximately £93m by 2033 through supporting innovation and new product development in science, technology and manufacturing sectors - strengthening industry, academia and government collaboration.</p>	<ul style="list-style-type: none"> • Investment in the development of high quality, flexible, specialist commercial and industrial premises to support research, commercialisation and collaboration. • Ensuring skills and training match the opportunities emerging from the green economy. • Ensure appropriate infrastructure to support R&D, prototype, commercialisation, business growth.
<p>IO3 - To secure over £11m in additional investment from public and private sources, and approximately £40m (within 5 years) additional leverage from public and private research funding by 2033</p>	<ul style="list-style-type: none"> • Investment in the development of high quality, flexible, specialist commercial and industrial premises to support research, commercialisation and collaboration. • Establish an open access facility to work with a range of industrial partners.

Investment Objective	Potential business scope & key service requirements
	<ul style="list-style-type: none"> Strengthen collaboration between government, industry and academia to secure private and private investment and research funding.
IO4 - To support innovation to influence a shift in the use of high CO₂ energy usage to low CO₂ energy usage in economic activities (industry, commercial buildings and transport) by 2033.	<ul style="list-style-type: none"> Providing proof of concept in decarbonisation interventions for industry, transport, buildings and economic growth. Increasing RD&I in steel and metals to support competitiveness and decarbonisation targets. Interventions to mitigate climate change and reduce carbon emissions in transport, commercial buildings and industry.

1.3.2 Main benefits

Table 1.8: Summary of main benefits

Investment objectives	Main benefits criteria by stakeholder group	Benefit classification	Stakeholder
SILCG IO1	<ul style="list-style-type: none"> Productivity gains including from commercialisation of R&D, using uplift in salaries of additional jobs to UK Commercialisation of new and improved products 	CRB	SBCR WG UKG Industry Academia Community Wider society
SILCG IO2	<ul style="list-style-type: none"> Productivity gain, based on uplift in salaries of additional jobs to UK Rental income Safeguard and create employment opportunities 	CRB	
	<ul style="list-style-type: none"> More resilient supply chain Build on existing strengths 	CRB	
		NCRB	
		NCRB	
SILCG IO3	<ul style="list-style-type: none"> Income related to industry collaboration and training Value of research, based on funding attracted from public funding sources Increase academia and industry collaboration and innovation Clustering impact 	CRB	SBCR WG UKG Industry Academia Community
		NCRB	
		NCRB	
		NCRB	

Investment objectives	Main benefits criteria by stakeholder group	Benefit classification	Stakeholder
	<ul style="list-style-type: none"> Establish the region as a test bed for innovative solutions to societal challenges e.g. air quality, decarbonised economic growth 	NCRB	Wider society
SILCG IO4	<ul style="list-style-type: none"> Reduction in energy demand and production of energy Reduction in CO₂ Research income for waste utilisation and low carbon processes. (Research income for new and improved projects not included to avoid double counting) Establish the region as a test bed for decarbonising economic growth Lower cost energy for commercial / industrial infrastructure Improved air quality 	NCRB NCRB CRB NCRB CRB	SBCR WG UKG Industry Academia Community Wider society

1.3.3 Main risks

Table 1.9: Summary of main risks

Risk Description	Mitigation
Developmental	
Resource capacity Resource capacity of programme / project teams, particularly during the development phase	Effective project governance / re-deployment if necessary / team working.
Procurement Failure to generate interest via tender process, potentially leading to increased costs / extended timescales - all projects	Detailed programme and resource allocation. Regular progress meetings and project monitoring.

Risk Description	Mitigation
Implementation	
<p>Programme slippage Slippage as a result of late business case approval, procurement delays or match funding requirements, which could lead to programme delay and / or increasing costs</p>	<p>Detailed programme and resource allocation. Regular progress meetings and project monitoring.</p>
<p>Planning delays Potential slippage, obstruction or increasing costs due to planning delays or unexpected planning conditions/ changes to planning legislation</p>	<p>Effective programme management and early communication with the planning authorities. Pre-application consultation initiated.</p>
<p>Land ownership issues Inability to negotiate land agreements in a timely fashion could lead to programme slippage and / or increased costs</p>	<p>Detailed programme and resource allocation. Early engagement with land owners. Regular progress meetings and project monitoring.</p>
<p>Technological advances Potential cost increases in the long term if equipment needs to be upgraded</p>	<p>Proper engagement with stakeholders to be carried out during development phase. On-going project management / monitoring.</p>
<p>Brexit New regulatory requirements could delay progress / increase costs</p>	<p>Close monitoring of political developments, together with regular progress meetings and effective programme management.</p>
<p>Covid 19 Delays due to potential staff shortages,</p>	<p>Close monitoring of developments, resource reallocation, effective programme management and progress meetings.</p>

Risk Description	Mitigation
procurement delays, lack of capacity from construction companies, supply chain difficulties, increasing costs, programme delays	C19 economic impact assessment closely monitored (Annex 1.4)
Operational	
Loss of key members of staff Resource capacity of programme / project teams, could lead to time delays, increased costs	Effective project governance / re-deployment if necessary / team working
Failure to achieve outputs / outcomes Could lead to clawback of funding and reduced impact of programme / projects.	A Monitoring and Evaluation Plan will be produced. Effective project management processes / meetings to be employed.
Financial	
Increasing capital costs Further funding could be required i.e., unforeseen costs, changing requirements, Covid etc.	Effective programme management / budget monitoring.
Dependence on multiple funding sources Further funding may be required if not all sources are secured.	Effective programme management / budget monitoring.
Short term WG and other funding sources	Effective programme management / budget monitoring.

Risk Description	Mitigation
Further funding may be required if not all sources are secured.	
Failure to secure tenants On-going revenue responsibilities affecting long term sustainability	Effective programme management processes / early advertising and engagement with potential tenants.

SILCG programme risk register is at Annex 5.4

Constraints and dependencies

1.3.4.1 Constraints

The constraints that have been placed on the programme are detailed below:

- Programme budget based on the fixed funding agreement between NPTCBC and the SBCD
- 15-year funding profile with a front-loaded delivery within 5 years
- Budget must be largely capital investment
- Availability of development sites
- Planning and development parameters
- Capital investment leverage from private sector

Each project within the programme has an agreed capital budget and delivery timeframe. Proven programme / project management methodologies will be implemented to ensure delivery within budget and management of change process. In addition, NPTCBC will be responsible for ensuring that the specified procurement route is implemented for each project.

Analysis of suitable development sites has been completed with suitable plots identified for each project. Any further constraints highlighted during design phase will be managed through the programme / project governance process. Also, the provision of public funding assistance to leverage private sector development has already been demonstrated as a successful model within the region.

1.3.4.2 Dependencies

In addition to creating synergy opportunities, the programme will ensure management of any inter-dependencies between the projects. An overview of these synergy

opportunities and inter-dependencies are shown in Annex 1.5. The key inter-dependencies are identified below:

- **Technology Centre and Hydrogen stimulus project:** *Excess energy from the Technology Centre will provide hydrogen fuel for vehicles. In addition, the Hydrogen Centre will be used to balance electricity supply and demand for the Technology Centre, reducing any demand from the grid.*
- **Scale up facilities for spin outs and further expansion and growth from innovation activities**

There are also a number of external dependencies outside the programme environment:

- **Renewable energy projects within the region:** *A stakeholder engagement plan has been developed to ensure alignment between the SILCG programme and other initiatives, programmes and projects in the region.*
- **SBCD Skills and talent project:** Combined approach across projects to identify skills and talent development requirements, building on existing platforms within the region. *Funding opportunities to be developed through SBCD skills and talent project*
- **Strategies and policy drivers:** Governance process to ensure a continual review of any new policies and changes that could have a potential impact on programme delivery.
- **Private sector engagement:** Stakeholder management at programme and project level.

2.0 Economic Case

2.1 Introduction

The Economic Case identifies the proposal that delivers best public value and should apply the principles of the Green Book Business Case Guidance.

The SILCG programme has developed organically over time, bringing together projects from the City Deal and the Port Talbot Waterfront Enterprise Zone strategic plan. As a programme the identified projects support economic development, diversification and growth of the economy, respond to climate change and improve air quality – the projects have evolved over time and are aligned to the green economy which is an important pillar of UK and Wales policy. The green economy offers opportunities for the SBCR to develop its emerging cluster of energy and technology related businesses, academic R&D institutions and a longstanding concentration of manufacturing industries, particularly in steel and metals.

Following a meeting with the Welsh Government Economist and the PoMO in December 2020, it was agreed that the SILCG Economic Case would provide a timeline detailing the development of the programme, providing evidence at key decision points. This Economic Case focuses on why and how the selected projects contribute to the programme:

- **Part 1** of the process is answering the question: is this the right proposal? In this case, we have explained the answer to that question through a careful examination of the development of the SILCG programme, project selection, project options and the mix and linkages of the projects that form the preferred way forward for the programme
- **Part 2** answers the question: is the proposal value for money? This is explained through mapping of benefits, an explanation of what information and evidence about the project benefits is available and undertaking CBA (with the caution that not all projects have been developed to a stage where individual project CBA can be undertaken)

2.2 Part 1: Proposal Rationale

2.2.1 Rationale for selection, options and a preferred way forward

Part 1 of the Economic Case, typically identifies a short-list from a long-list, using the 'options framework', identifying solutions for different categories of choice: *scope*, *service solution*, *service delivery*, *implementation* and *funding* – considering less – to

more ambitious options for each category and qualitatively assessing them using standard Critical Success Factors (CSFs)⁶⁹, to identify a preferred way forward.

2.2.2 Developing the proposal

For a programme, the solutions identified in the options framework are the ‘projects’ which make up the programme and the output of the options framework is a short-list of potential projects where a more ambitious programme has a greater number of complex projects and a less ambitious programme, fewer, simpler projects.

The organic development of the SILCG programme means that projects have not been selected through a single ‘point-in-time’ comparison of different versions of a programme, aiming to meet the same objectives and assessed against Critical Success Factors, but started with the Swansea Bay City Economic Regeneration Strategy (2013) and subsequently the City Deal. This led to iterative development of the programme in terms of sector focus and intended outcomes and responded to the shifting focus of government policy. This has seen the constituent projects develop over time – some being deleted, changed or merged as the programme developed. Each identified project has (or will) undergo a project-level options analysis to determine a preferred way forward within the scope of that project.

The following **Critical Success Factors**⁷⁰ were used during the the programme development:

⁶⁹ Standard CSFs are set out in the Green Book Business Case Guidance: strategic fit, value for money, supply side capability and capacity, affordability and achievability – they should normally be used alongside the agreed investment objectives when undertaking qualitative assessment in the economic case (e.g. ‘strategic fit’ is how well an option is likely to deliver the investment objectives/outcomes)






⁷⁰

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938046/The_Green_Book_2020.pdf

Key Critical Success Factors	Description
Strategic fit and meets business needs	Alignment of the SILCG Programme with the key UKG, WG and regional policies and strategies including UK Industrial Strategy, WG Prosperity for All, WFGA and the SBCR Economic Regeneration Strategy. Meets the Programme's 4 agreed investment objectives related business needs and service requirements;
Potential value for money	Optimisation of VfM through an integrated Programme of economic and environmental projects to achieve the required benefits.
Supplier capacity and capability	Viable and compliant route to procurement for the effective delivery of all the Programme
Potential affordability	Affordable solution within the parameters of funding availability and constraints for the Programme partners
Potential achieveability	Ability to provide robust and effective management arrangements for the delivery of the Programme

The overall development timeline and key stages in the development of the SILCG programme are shown in Figure 2.1, below shows the chronology of development of the SILCG Programme from its origins over a period of approximately 2 years.

Key to figure 2.1.

- 'Actors' (those involved in the process) are displayed in: 
- Key actions are described in: 
- Key documents are described in: 
- Further detail of agreements or outcomes are described in: 
- Future decision points are represented with: 

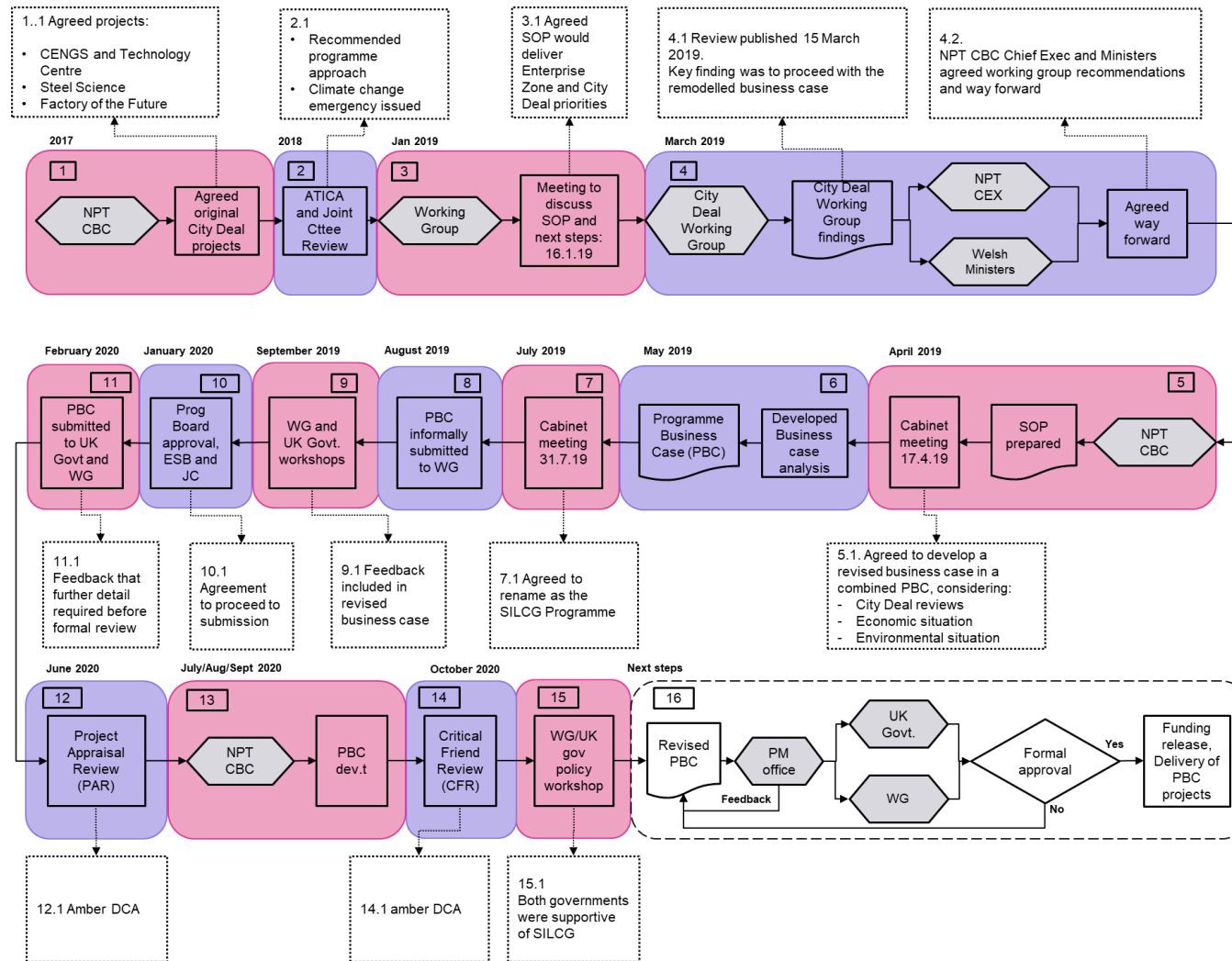


Figure 2.1: Overall development timeline and key stages of the SILCG programme

Figure 2.1 has numbered boxes for each time period and should be read from box 1 to box 12. Each box shows the key developments and outcomes within that period. These are described in further detail in table 2.1 below:

Table 2.1: Key development and outcomes within each time period

Box	Activity/outcome description
1	In 2017 the origins to the SILCG Programme were developed in 2018-19 as 'City Deal' (CD) projects and City Deal Heads of Terms were agreed (March 2017).
1.1	The original agreed City Deal projects were: CENGs and Technology Centre, Steel Science and Factory of the Future. Neath Port Talbot CBC was appointed as the Local Authority lead.
2.	In January 2019 Actica Consulting Ltd was commissioned by the Welsh and UK Governments to undertake a joint Government review of the arrangements of the Swansea Bay City Deal programme. Link to Actica Consulting Ltd review: https://www.gov.uk/government/publications/swansea-bay-city-deal-independent-review
2.1	A number of recommendations emerged, one of the seven Actica recommendations was Recommendation 6 - <i>The SB CD should be managed as a portfolio not as a set of predetermined and immutable projects.</i> https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/786210/Actica Consulting Swansea Bay City Deal Independent Review Report.pdf
3	In January 2019 , the City Deal reviews prompted NPTCBC to establish a working group to consider the current projects and how they may evolve to align to the review recommendations, the WG climate change emergency, the macro economic situation and current strategies in the region, in particular the Port Talbot Waterfront Enterprise Zone Strategic Plan.
3.1	On 16.1.19, the NPTCBC working group agreed a Strategic Outline Programme (SOP) business case would be developed for both PTWEZ and CD projects. See Annex 2.1 (SILCG SOP)
4	In March 2019 a NPTCBC City Deal Working Group was convened to review the current position; in particular, the constituent projects.

Box	Activity/outcome description
4.1	<p>The internal City Deal Joint Committee Review to review the governance arrangements of the SBCD.</p> <p>Link to Joint Committee internal review: https://www.swanseabaycitydeal.wales/media/1413/20190314-sbcd-final-report.pdf</p> <p>The City Deal Review published its findings 15.3.19 and concluded to proceed with the remodelled business case. See NPTCBC Cabinet report 17/04/2019 (paras 26 and 28):</p> <p>http://moderngov.neath-porttalbot.gov.uk/documents/s46130/Swansea%20Bay%20City%20Deal.pdf</p>
4.2	<p>Review findings were discussed with NPT Chief Executive and Welsh Minsiters and the proposed approach was agreed. This is noted in NPTCBC Cabinet report 17/04/2019 (paras 26 and 28):</p> <p>http://moderngov.neath-porttalbot.gov.uk/documents/s46130/Swansea%20Bay%20City%20Deal.pdf</p> <p>and in para 4, NPTCBC Cabinet Report 31/07/2019:</p> <p>http://moderngov.neath-porttalbot.gov.uk/ieListDocuments.aspx?CId=158&MId=8692&Ver=4</p>
5	<p>In April 2019, NPTCBC developed an initial draft of the SOP to address the recommendations. Alongside this, officials considered how new developments should be incorporated – the prevailing economic and environmental situation (prompted by Welsh Government’s increasing focus on the environment).</p>
5.1	<p>NPT Cabinet agreed the developing PBC should consider these issues alongside the existing PTWEZ and CD proposals in one combined PBC on 17 April 2019:</p> <p>http://moderngov.neath-porttalbot.gov.uk/documents/s46130/Swansea%20Bay%20City%20Deal.pdf</p>
6	<p>In May 2019, officials further developed the SOP (now referred to as the ‘SILCG Programme Business Case’)</p>

Box	Activity/outcome description
7	In July 2019 , NPT Cabinet met to discuss the PBC
7.1	On 31 July 2019 NPT Cabinet approved the further development of the SILCG PBC and agreed this should be called the 'Supporting Innovation and Low Carbon Growth' Programme (SILCG)
8	In August 2019 the OBC was submitted to WG/UKG for informal review
9	In September 2019, workshops were held with WG and UK Government to discuss and agree the approach to SILCG
9.1	Key agreements and feedback from these workshops were: See workshop notes and feedback See Annex 2.2 WG/UKG SILCG workshop notes / feedback
10	In January 2020 , the SBCD ESB, Programme Board and Joint Committee considered the draft PBC
10.1	The SBCD ESB, Programme Board and Joint Committee endorsed the SILCG business case and agreed for it to proceed to formal submission to WG and UK Governments. SBCD Joint Committee 28/01/2020: https://democracy.swansea.gov.uk/ieListDocuments.aspx?CId=664&MId=8794&Ver=4&LLL=0
11	In February 2020 , the draft PBC was submitted to WG and UK government for formal consideration.
11.1	Feedback from WG indicated that further detail on the projects within the SILCG programme was required. The SBCD programme needed to action review recommendations before further business cases would be reviewed. Reference: Helen Davies WG MS Teams meeting with NPTCBC and PMO
12	In June 2020 , the SILCG programme underwent a Project Appraisal Review (PAR) The National Steel Innovation Centre (NSIC) project was refocused and the project name was changed to SWITCH. This was formalised at the first SILCG Programme Board meeting.

Box	Activity/outcome description
12.1	The PAR resulted in an 'amber' DCA and seven recommendations. See Management Case Annex 5.7 - PAR report
13	In July – September 2020 , NPTCBC further developed the PBC, particularly concentraing on providing evidence to support the economic case for the agreed programme of projects.
14	In October 2020, the SILCG Programme was subject to a formal Critical Friend Review (CFR) in accordance with Gateway Review procedures.
14.1	The CFR resulted in an 'amber' DCA with four recommendations See Management Case Annex 5.8 - CFR report
15	In November 2020, the revised PBC was shared with WG and UKG and a workshop was held with WG and UKG to provide informal feedback / advice on the updated PBC.
15.1	Key feedback was that both governments were supportive of the SILCG.
16	Next steps: Since the CFR, NPTCBC has continued to develop the PBC, focusing on strengthening the supporting economic justification. The next steps will comprise agreeing the updated PBC with the UK Government and Welsh Government. Formal approval of the PBC will result in funding release and subsequent delivery of PBC projects. If the proposal is rejected (e.g. to be amended prior to re-submission), it will return to NPTCBC for further development before being presented again.

2.2.3 Assessment of project options

In addition to selecting the projects described above, each individual project has undergone an analysis of alternatives to determine the preferred way forward. Table 2.2 summarises the projects.

Table 2.2: Summary of projects in the programme

Project	Description	Outcome and Timing
Technology Centre (TC)	2,500 sqm office and laboratory facilities in a demonstrator energy positive building. Target SMEs in energy & renewables sector.	Preferred way forward established September 2020
SWITCH	Applied Research Centre for the RD&I steel and metals sector.	Preferred way forward established September 2020
Hydrogen stimulus project (H2)	H2 Centre infrastructure improvements to increase H2 production, procurement of hydrogen vehicles as demonstrators and an electrical link between SBTC and H2 Centre.	Preferred way forward established September 2020
Air quality monitoring project (AQMP)	Test and deploy a network of low-cost air quality monitoring sensors.	Preferred way forward established September 2020
Low emission vehicle charging infrastructure (LEV)	Development of a low emission vehicle charging strategy, coordination of funding opportunities for roll out of charging points, and case study.	Preferred way forward established December 2020
Advanced Manufacturing Production Facility (AMPF)	4,000 sqm facility based on 'proving factory' concept with testing and other specialist equipment. Target SMEs in energy & renewables sector.	Preferred way forward established October 2020
Property Development Fund (PDF)	Investment fund providing grant funding of up to 45% to support property developer / investor-occupier development on PTWEZ. Estimated at 6,000sqm.	Preferred way forward established September 2020

2.2.4 Linkages, mix and positioning of the projects within the SILCG programme

2.2.4.1 Linkages and interrelationships

Figure 2.2 shows the SILCG programme in terms of each project's inputs and their inter-relationships which demonstrates their synergies in terms of project activities. For example, the Advanced Manufacturing Production Facility provides 'proving factory' concept accommodation and R&D facilities for tenants who will be undertaking proof of concept and prototyping new products in the facility - late TRL level to MRL level. The Technology Centre, whilst housing tenants engaged in R&D and testing activities, is also a proof of concept / testing facility itself, in that the building is planned to be energy positive. SWITCH will directly enable R&D, testing and scale up in industry sectors of concentration in the region. The clustering of activity will help to stimulate demand and with it, potential network and knowledge sharing benefits.

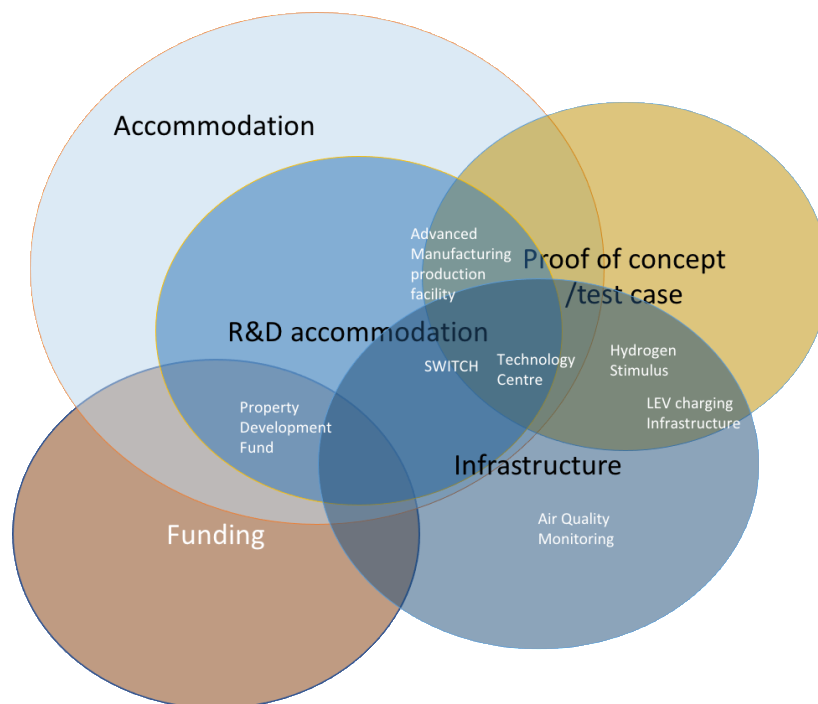


Figure 2.2: Interrelationship of the SILCG programme

2.2.4.2 Project mix and positioning

The SILCG programme includes a diverse range of projects in terms of mix and positioning.

Figure 2.3 shows the mix of projects across two dimensions:

- The X axis shows the level of innovation, with early stages of technological readiness (TRL) to the left and established technologies (MRL) to the right. This shows the level of risk associated with each project, from a technology perspective
- The Y axis shows the type of activity of the project, whether it is funding actual R&D activities, or whether it is providing bespoke R&D facilities or accommodation/infrastructure that is applicable to a range of industry sectors

The programme is balanced and comprises a diverse mix of projects, with at least one project in each quadrant. The Property Development Fund for example, facilitating widely applicable and established support to industry (top right quadrant), while the hydrogen stimulus programme (bottom left-hand quadrant) R&D focused and at an earlier TRL stage.

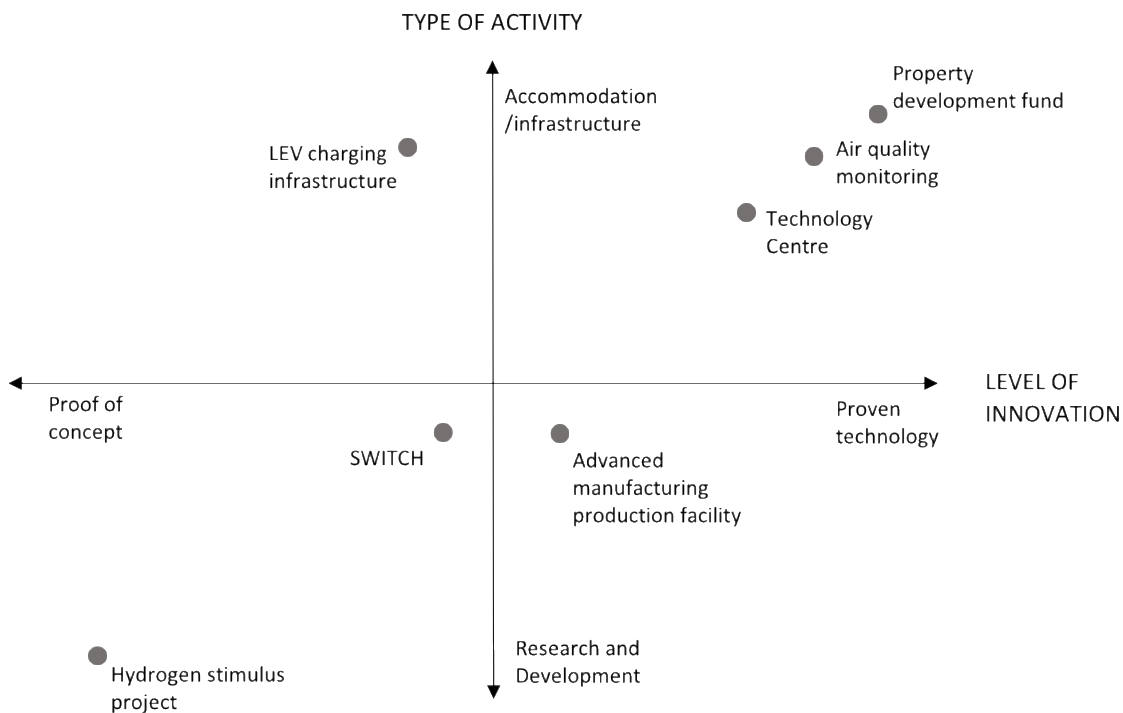


Figure 2.3: SILCG programme mix and positioning of projects

2.3 Part 2: Examining Value for Money

2.3.1 Approach to part 2 of the Economic Case

Part 2 of the Economic Case examines the value for money of the programme. It explains the application of CBA to the programme including the calculation of the Benefit Cost Ratio (BCR). It takes into account that the projects are developing

separately and not all activities and specific quantified outputs monetised through cost benefit analysis, are available.

The programme BCR calculation focuses on the larger projects with greater capital costs, where the benefits have been able to be quantified and monetised. The smaller projects – H2, AQMP and LEV – have not been included in the BCR calculation; however, their benefits – which together account for 6% of the total City Deal ask – are assessed qualitatively in considering the overall value for money of the SILCG programme.

The programme BCR analysis calculation clearly presents:

- Presentation of which costs have been included,
- Which outputs have been quantified outputs
- How benefits have been monetised, interpreting the results and conclusions with respect to overall value for money.

Part 2 is primarily undertaken with respect to the economic impact to the UK as a whole and the BCR refers to UK and includes consideration of Place Impact (section 2.3.9) in response to the latest update of the Green Book in November 2020.

2.3.2 The programme counterfactual

The counterfactual reflects the situation if the programme and its relevant projects did not go ahead in the business as usual (BAU) position, which has future cost/benefit implications.

The Strategic Case explains trends in the regional economy and in environmental considerations and legislation. The SILCG combines the objectives of meeting both economic performance and environmental objectives. The implications of not taking forward projects to support these mutual objectives could be severe.

The existing industrial base is at risk if businesses do not embrace innovation to remain competitive; while if decarbonisation efforts do not materialise, zero carbon targets will not be met. The programme will safeguard business and thousands of jobs in transport and metals and their corresponding supply chains and develop and test new technology and growth sector opportunities in line with the Green Industrial Revolution policy areas.

The counterfactual and the CBA, following Green Book guidelines considers the UK as a whole. For example, a firm relocating from Surrey to Swansea Bay, represents no difference from a UK perspective and simply displaces activity from one region to

another. There are differences, for example if there is a far stronger enabling environment for the business to grow in one region vs another, lower operating costs etc but that is not explicitly captured. Note the clustering argument is made above. Hence what is considered to be additional to the UK in terms of economic activity and other benefits as measured through CBA, is not the same as that for Swansea Bay and the additional benefits and impacts, could be much higher.

Specifically, for the CBA, project specific assumptions for the counterfactual have been adopted, as set out in the following table.

Table 2.3 Implications of business as usual for each project under the SILCG programme

	Counterfactual
Technology Centre	<p>Land remains undeveloped. Tenants would either not exist due to lack of suitable facilities and support; or occupy other buildings in the UK or abroad, with higher emissions footprints, and may have poorer business performance outcomes.</p> <p>No proof of concept of energy positive commercial building.</p>
SWITCH	<p>Local steel industry becomes vulnerable as it fails to meet carbon emissions targets. Potential offshoring of steel industry with impact to local jobs and global carbon emissions (given the need then to ship steel back to the UK).</p> <p>The existing research organisations and projects would continue for a limited period involving some upgrade of facilities in order to keep them operational.</p> <p>Equipment acquired through the closure of other facilities would remain unutilised.</p>
Hydrogen stimulus project	<p>The existing H2 Centre remains close to capacity with inability to broaden offerings and demonstrate viability of charging vehicles via excess PV electricity generation.</p> <p>NPT Council would procure new diesel vehicles in the usual way, with resulting CO2 and pollutant emissions.</p>

	Counterfactual
Air quality monitoring project	Continued use of current network of expensive and resource intensive monitoring equipment without ability to collect localised data with implications for policy making and effectiveness.
Low emission vehicle charging infrastructure	Take up of electric vehicles in the region would remain slow and may miss roll out targets. Carbon and other pollution emissions would remain higher. Lack of coordination of charging infrastructure.
Advanced Manufacturing Production Facility	Tenants would either not exist due to lack of suitable facilities and support; or occupy other buildings elsewhere with higher emissions footprints, and may have poorer business performance outcomes.
Property Development Fund	Fewer companies invest in the PTWEZ. Developers are less active in this market due to the cost / value gap issues and low rental yield.

2.3.3 Project Maturity

Table 2.4 shows the status of each project within the programme.

The programme-level CBA draws on information for each project which is more developed for some than others.

Table 2.4 Project status

Project	Project status
Technology Centre	Construction started.
SWITCH	OBC submitted for CFR in September 2020. Building specification workshops to commenced.
Hydrogen stimulus project	Technical discussions started.
Air quality monitoring project	Sensors purchased. Communications plan developed, 15 sensors deployed for calibration.
Low emission vehicle charging infrastructure	Procurement specification in development.

Project	Project status
Advanced Manufacturing Production Facility	Building specification workshops commenced supported by Industry Wales. Procurement specification in development for operator.
Property Development Fund	Scheme guidance developed. Procurement specification in development.

2.3.4 Programme costs and phasing

Table 2.5 shows the total, capital and operational costs over a 30-year operational life (or 2053 whichever the sooner) as well as when the project is expected to be operational. The SILCG City Deal programme capital contribution is £47.7 million with a total estimated programme capital cost of £58.7 million. The four largest projects are the Technology Centre, SWITCH, Advanced Manufacturing Production Facility and the Property Development Fund, which account for 94% of the City Deal spend.

Table 2.5 Programme costs (undiscounted) and phasing

Project	Asset ownership & operations	Total capital cost £m	City deal contribution £m	Operational costs £m	Operational Start
Technology Centre	NPT own and manage	8.5	3.0	6.2	End 2021
SWITCH	NPT own, Swansea University manage	20.0	20.0	156.7	Oct 2023
Hydrogen stimulus project	NPT own the project including TC, link and vehicles USW procure and own the equipment and manage the hydrogen centre	2.0	2.0	Not included	Sept 2022

Project	Asset ownership & operations	Total capital cost £m	City deal contribution £m	Operational costs £m	Operational Start
Air quality monitoring project	NPT own and manage	0.5	0.5	Not included	Sept 2021
Low emission vehicle charging infrastructure	NPT own and manage	0.5	0.5	Not included	July 2022
Advanced Manufacturing Production Facility	NPT own. NPT procure operator	17.2	17.2	14.5	Early 2025
Property Development Fund	NPT to manage fund. Private Sector to contribute at least 55% City Deal provides max. 45% Project applicant owns asset	10.0	4.5	8.8	April 2021
TOTAL		58.7	47.7	186.2	

Note: SWITCH appears to have a relatively high operational cost but this is somewhat misleading as the majority of SWITCH operational costs are covered by revenue funding for the research projects undertaken

2.3.5 Mapping programme benefits

Figure 2.4 shows a theory of change map for the SILCG programme. The diagram can be read bottom up and top down to understand the linkages and influences between projects and ultimate programme objectives.

Reading the diagram bottom up explains how projects will target 'enabling changes' to drive benefits and achieve the programme objectives, including sponsoring and facilitating research activities and industrial innovation, mandating energy efficient building standards, and implementing affordable rental policies.

These changes are expected to lead to a series of intermediate benefits, many of which can be quantified and monetised, which then lead to end benefits (delivering the investment objectives of the programme), all of which can be categorised under improvements to either environmental or economic performance within the region.

For example, the Advanced Manufacturing Production Facility, by fostering research activities and industrial innovation and by offering space at affordable rents with open access specialist equipment, will provide affordable and suitable premises for companies that will develop and deliver new products and processes in reducing industrial energy demand, carbon emissions and pollutants. The affordable space and funded equipment will also improve the prospects of companies to survive and grow, magnifying the potential impacts of their innovations. Company growth and survival will support diversification of the local economy as well as potentially supporting/safeguarding the existing industry base.

Reading the diagram top-down, improved economic performance relies on onshoring activity, diversification i.e. greater activity in new industry sectors, as well as and safeguarding the existing industrial base. Greater activity in new industrial sectors is driven by greater adoption of innovation and better company survival and growth rates. Improved company survival and growth rates is driven by affordable accommodation and commitment to early adoption. Affordable and suitable accommodation to rent is driven by City Deal investments in the Technology Centre and Advanced Manufacturing Production Facility.

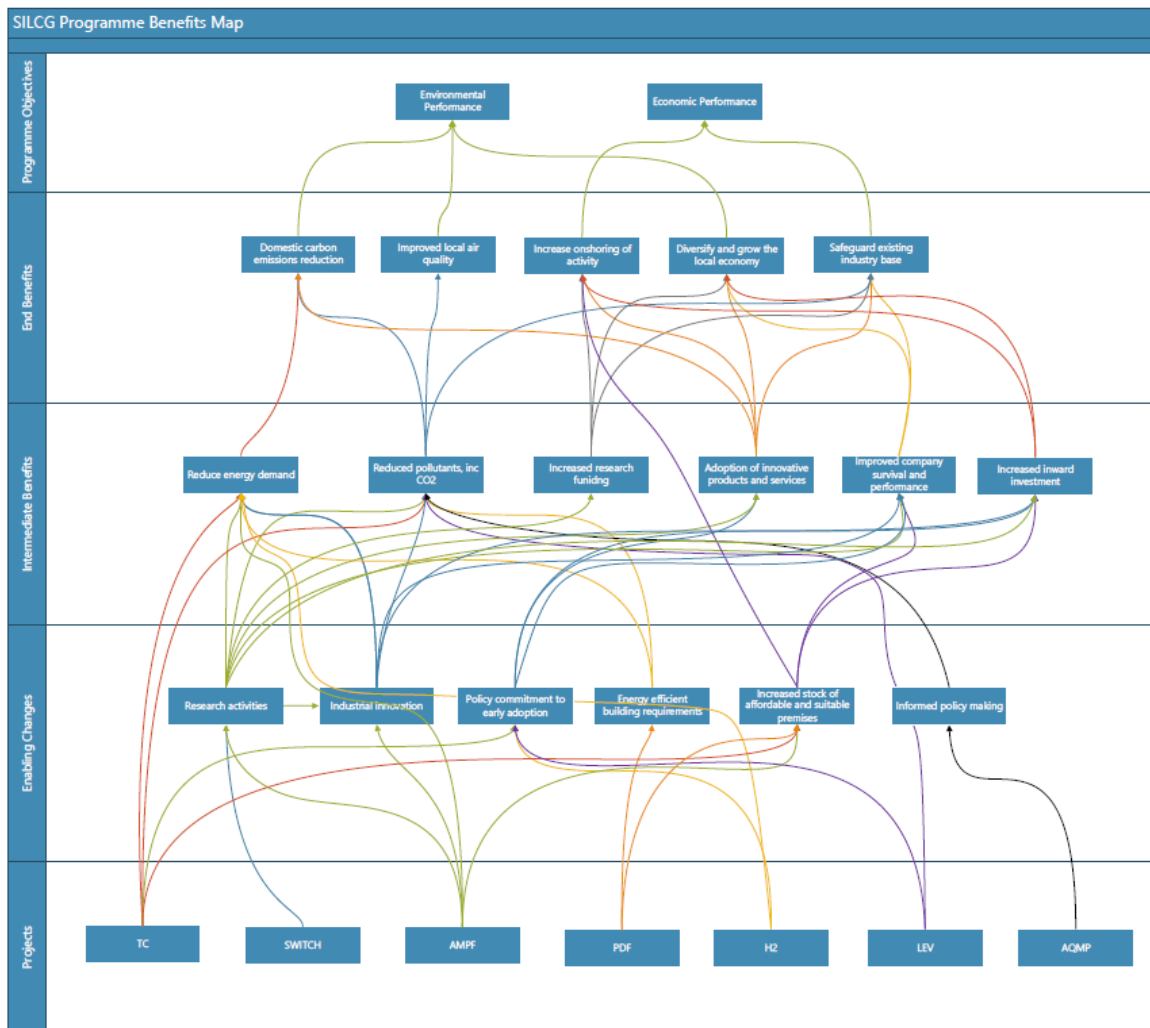


Figure 2.4: Mapping SILCG projects and benefits

2.3.6 Key programme outcomes and benefits

2.3.6.1 End benefits

The end benefits of the SILCG programme include:

- reduction in carbon emissions
- improved air quality
- greater onshoring of activity
- greater diversification of the local economy
- safeguarding existing local industrial base with corresponding improvement in overall environmental and economic performance

There are also indirect benefits of strengthening the green economy and innovation cluster which may attract further investment and economic activity in the SBCR that

are intended outcomes of the programme but are notoriously difficult to predict or quantify at this stage.

End benefits and their attribution to the SILCG programme would only be possible – to any degree of certainty – after the projects have been implemented and operating for several years. At this stage, it is more feasible to focus on the intermediate or more direct benefits that arise from the individual projects whilst acknowledging that this approach is unlikely to be able to reflect all the benefits that arise from the synergy of the projects and the programme as a whole.

For the purpose of the BCR calculation, programme benefits are assessed with respect to the UK as a whole and benefits accruing to SBCR may be greater (and contribute to levelling up). Additional economic activity in SBCR is not counted as a benefit for the purpose of BCR calculation, if it is simply displacing activity from other UK regions.

With reference to figure 2.4, mapping projects and benefits, **six key intermediate benefits** have been identified and valued / monetised where possible:

Reduced energy demand from the grid

The **Technology Centre** is designed as an energy positive building and strict energy efficiency standards for the other facilities including SWITCH, the Advanced Manufacturing Production Facility and the Property Development Fund will also likely reduce the demand for energy from the grid compared to what would happen otherwise. Upgrading the commercial property stock to meet higher standards through policy measures or commercial take-up of the ideas tested in the Technology Centre would also reduce the demand for energy.

The Technology Centre reduction in energy demand to zero from the grid has been estimated by comparison with the energy use in kWh of a standard commercial building. The value of reduction in energy demand to zero is about £5,000 per 1,000sqm or about £25,000 per year for the Technology Centre. Annex 2.3 presents assumptions and details of the calculations.

Other facilities will encourage the use of energy efficient solutions. However, reduction in energy demand for other facilities is not included in the monetised calculation since the reduction in energy use is not sufficiently known at this stage.

Further reductions in energy demand from the SILCG programme could occur indirectly through energy saving products and processes being developed in the

various facilities and taken up by the market. These potential benefits are not included since they cannot be estimated at this stage.

Reducing emissions (including CO₂)

The reduction in carbon emissions from reduced energy demand in the **Technology Centre** is calculated using the relevant values for traded and non-traded carbon in accordance with Supplementary Green Book guidance. The value is about £2,500 per 1,000sqm, about £10,000 per year for the Technology Centre. Annex 2.3 presents assumptions and details of the calculations.

The **Hydrogen Stimulus Project** will reduce carbon emissions via the substitution of diesel fuel use by council and other vehicles with hydrogen power generated from excess renewable energy generation at the Technology Centre. The magnitude of these emissions reductions is not currently quantifiable for the benefits analysis, but will become so as additional project details are confirmed.

The **Low Emission Vehicle project** will directly reduce carbon emissions but the estimated reduction in CO₂ is not sufficiently documented to date and it is not included in the valuation of benefits.

Research and business activities to reduce emissions are supported throughout the programme through providing affordable and suitable accommodation to firms engaged in the green economy as well as an applied research facility for the steel and metals sector, the largest employer and arguably most important economic sub-sector. All of these activities support emissions reductions but any measurement of benefits can only be intermediary benefits at this stage as the eventual impact on emissions will depend on the specific research and business activities undertaken and so whilst reducing emissions is an end goal or ultimate benefit, at present there is insufficient information to quantify or monetise most of the eventual emission reduction impacts.

Increased research funding

Greater collaboration of academia and industry through **SWITCH** and the research focus on decarbonisation will attract research funding. This is estimated at about £6.5 million per year.

The **AMPF** operator is also expected to support tenants in attracting research funding from a range of sources including UKRI Industrial Strategy Challenge Fund and other UK government funding such as the Strength in Places Fund and the Industrial Energy Transformation Fund. This is estimated at about £0.5 million per year, excluding contributions from the private sector.

Commercialisation and take-up of new products and services

R&D, innovation, scaling-up and other prototype and testing which ultimately may lead to the take-up of new products and services, particularly in the green economy is central to the SILCG programme.

All projects except the Property Development Fund contribute to this benefit either directly or indirectly. Direct testing or scale up of activity and measuring its impact is only part of the story. It is the take-up and commercialisation of products and services by the market which is where the true value of R&D and innovation and is realised.

The **Technology Centre, SWITCH** and the **Advanced Manufacturing Production Facility** will accommodate businesses that are engaged in these activities.

SWITCH has undergone a detailed CBA in which the value of the potential commercialisation of the activity going on inside the building and its attribution has been calculated. This benefit valuation method for SWITCH was used for research and development of new and improved products and included: assessing the success rates of research and development projects; and estimating marginal uplift in the market value of new and improved products for different market segments over a reasonable time period. Even taking into account that only about 10% of the value could be attributed to SWITCH, the annual value was about £2 million, growing to about £6 million over the life of the project.

Whilst R&D, and testing are critical to the take up of innovation, estimating the rate or value of take up is very difficult at the early stages of a project, indeed, often it is only possible once the project has been implemented and in delivery phase.

The 3 smaller decarbonisation projects have identified uses as test-beds and aim to encourage adoption of new technology:

- The **Hydrogen Stimulus Project** will test viability and commercial application through Neath Port Talbot running vehicles using the technology
- The **Technology Centre** will provide a test case for an energy positive building, and also has test-bed and early adoption policies to facilitate commercialisation of tenant products and processes
- The **LEV charging infrastructure project** will encourage the take-up of LEV across the region

However, the eventual take up and attribution to the SILCG programme is not possible to predict at this stage and so the benefits of these projects are not monetised and excluded from the BCR calculation.

Demand for Business Accommodation, Business Survival and Performance

All of the facilities included in the SILCG programme that provide suitable and affordable accommodation, as well as other services including equipment, test-bed and early adoption etc will help target Spin Outs and SMEs to survive. That is not to say they all will, but that their success rate is likely to be higher and with the commercialisation of innovation undertaken within the facilities, businesses will have a greater chance to perform better, to grow and expand.

Target sectors have been identified for the Technology Centre, and the Advanced Manufacturing Production Facility will be managed by a procured operator who will also access research and innovation funding opportunities such as from Innovate UK. For these facilities which will be let to tenants, the estimated rental income from the tenant is adopted as a benefit.

For the **Technology Centre and the Advanced Manufacturing Production Facility** facilities, there is strong evidence of demand for accommodation. Estimates of productivity gains, number of additional jobs to the UK and uplift in salary is based on evidence from:

- Monitoring of existing facility projects and companies in the local area as provided by Neath Port Talbot CBC including evidence from the companies themselves on salaries compared to average salaries, for detailed assumptions – see Annex 2.4⁷¹
- Evidence from the Baglan Bay Innovation Centre where about 40% of the floorspace is occupied by university spin outs and 82% is occupied by companies classified as RD&I (43%) and product development/technology (7%), ICT (14%), energy and life sciences (17%) – see Annex 2.5
- Analysis of the Neath Port Talbot CBC enquiries database where total floorspace demand was some 6,500sqm for enquiries for less than 400sqm whilst 55% of total enquiries by floorspace was from organisations classified as RDI, Innovation Manufacturing or Energy – see Annex 2.5

The estimated productivity gain is based on the number of additional jobs to the UK (about 80% of those accommodated based on the evidence above from Baglan Bay Innovation Centre) and the salary uplift about £10,700 a year. Since the target firms in the facilities are Spin Outs and SMEs in RDI and it is anticipated that there will be

⁷¹ Actual salary information is confidential. The uplift is based on data from existing companies in NPT and their reported salaries

considerable turnover in the facility as companies achieve success, grow and then move to larger premises, the salary uplift is assumed for the time period of the project.

Inward Investment

Inward investment is anticipated as a result of the greater scale, reputation for and attractiveness of the green economy cluster. The Property Development Fund could be used for companies wishing to locate to the UK and SBCR. These target companies in high-tech, innovation sectors will have greater productivity, and demand from firms in sectors including RD&I, innovation, manufacturing and energy accounted for a significant number of enquiries to Neath Port Talbot CBC for accommodation.

Based on Neath Port Talbot CBC monitoring of existing facilities, 50% of jobs accommodated are assumed to be additional and the same salary uplift of about £10,700 is adopted. The uplift is adopted for 15 years after the fund is taken up. It is possible, particularly given the target companies / sectors that a greater number of the jobs are additional, in which case the estimated benefits included would be a lower bound estimate of actual. The estimated rental income is adopted as a cash releasing benefit to the owner for the PDF.

2.3.7 Monetised cost benefit analysis and BCR calculation

2.3.7.1 Key assumptions

The Cost Benefit Analysis is undertaken in constant prices and for the buildings projects includes construction period and 30-year operational life of the facility or 2053 whichever earlier. Costs and benefits are included in the year in which they occur and discounted at the social discount rate of 3.5% according to Green Book guidelines. Detailed assumptions for each individual project are included in Annex 2.4.

As explained in section 2.3.1, the BCR calculation includes the four larger projects only, the Technology Centre, SWITCH, AMPF and PDF.

Table 2.6: Quantification and monetisation of project outcomes and benefits for BCR calculation

Project	Benefits included	Type of Benefit
TC	Reduction in energy demand and production of energy	Non-cash releasing to wider society
	Reduction in CO ₂	Non-cash releasing to wider society

Project	Benefits included	Type of Benefit
	Rental income	Cash releasing to wider society (since operator will be procured)
	Productivity gains including from commercialisation of R&D, using uplift in salaries of additional jobs to UK	Non-cash releasing to wider society
SWITCH	Commercialisation of new and improved products	Cash releasing to wider society
	Research income for waste utilisation and low carbon processes. (Research income for new and improved projects not included to avoid double counting)	Cash releasing to project proponent
	Income related to industry collaboration and training	Cash releasing to project proponent
	Note counterfactual included the cost of the existing facility remaining for a short period	Cash releasing to project proponent
AMPF	Rental income	Cash releasing to wider society (since the operator will be private sector)
	Productivity gains including through commercialisation of R&D, based on uplift in salaries of additional jobs to UK	Non-cash releasing to wider society
	Value of research, based on funding attracted from public funding sources	Non-cash releasing to wider society
PDF	Rental income /avoided income if owner occupier	Cash releasing to wider society
	Productivity gain, based on uplift in salaries of additional jobs to UK	Non-cash releasing to wider society

Table 2.7: Results of the monetised CBA, BCR calculation

	Programme vs Counterfactual	
	Undiscounted	Discounted
Costs in the Appraisal of Public Value		

		Programme vs Counterfactual	
		Undiscounted	Discounted
1. Total Direct Public Costs (to originating organisation)		101.3	71.9
1.1	Capital	44.7	41.1
1.2	Revenue	56.6	30.8
2. Total Indirect Public Costs (to wider public sector)		98.8	55.5
2.1	Capital	11.0	10.3
2.2	Revenue	87.8	45.2
3. Wider Social Costs		42.8	23.0
3.1	Capital	-	-
3.2	Revenue	42.8	23.0
4. Total Risk Costs		5.0	4.7
4.1	Optimism bias	5.0	4.7
4.2	Estimated or measured risk	-	-
5. Total of Costs		247.9	155.1
Benefits in Appraisal of Public Value		-	-
6. Total Direct Public Sector Benefits		137.9	77.5
6.1	Cash releasing benefits (CRB)	137.9	77.5
6.2	Non-cash releasing benefits (NCRB)	-	-
7. Total Indirect Public Sector Benefits		-	-
7.1	Cash releasing benefits (CRB)	-	-
7.2	Non-cash releasing benefits (NCRB)	-	-
8. Wider Social Costs		315.9	172.3
8.1	Cash releasing benefits (CRB)	152.6	76.3
8.2	Non-cash releasing benefits (NCRB)	163.3	96.1

	Programme vs Counterfactual	
	Undiscounted	Discounted
9. Total Value of Benefits	453.8	249.8
Net Public Value	205.8	94.7
Benefit Cost Ratio	1.8	1.6

2.3.7.2 Interpretation of results

Table 2.7 shows the overall results for the programme, and details of these calculations are shown in Annex 2.6.

The analysis shows that the SILCG programme adds value to the UK overall with an overall NPSV of about £95 million and the discounted BCR is 1.6. The programme delivers a positive NPSV overall, and there are also extensive qualitative benefits which should arise from the programme which would benefit society as a whole. All results are presented relative to the counterfactual.

All of the individual projects i.e., Technology Centre, SWITCH, Advanced Manufacturing Production Facility and the Property Development Fund have positive NPSVs and BCRs. The method adopted for the monetisation of benefits in the SWITCH project was the most sophisticated, as for this facility, it was possible to identify the types of research projects that would be undertaken, their relative success and commercialisation, as well as detailed assessment of the types of research and other income that might be attracted to the facility. The other large projects rely on rental income and broader estimates of productivity gains using additional job and salary uplift-based estimates, which may not fully capture the value of test-bed, research activity and commercialisation of products that are targeted for tenants of the Technology Centre and Advanced Manufacturing Production Facility in particular. The monetised benefit estimates for these facilities might thus be considered a lower bound estimation.

For the three smaller projects; Hydrogen Stimulus Project, Low Emission Vehicle and Air Quality Monitoring Project, some details of project outcomes are yet to be developed and thus they have not been included in the BCR as their benefits have not been quantified or monetised. However, there are numerous unquantified benefits of these projects. These include the potential for improved and more effective policy making in the case of the AQMP to a clear demonstration of the viability of the use of excess renewable energy generation to decarbonise transport for the hydrogen stimulus project.

The overall programme and the projects together deliver potential benefit in research, prototyping and testing, scale up and commercialisation of innovation and low carbon products and processes that could be adopted at scale elsewhere. However, these benefits are difficult to capture in BCR type calculations and are considered together with other qualitative considerations below.

2.3.8 Qualitative considerations

At the programme-level, additional qualitative benefits should be considered, which will likely never be quantifiable or monetisable, but which will result in value and advantage for the SBCR and for the UK, which cannot be disregarded:

- Programme completion is likely to achieve notable clustering and reputational benefits for South Wales as an area of sustainable and low carbon innovation
- SWITCH may help establish the area as a global leader in low-carbon and energy efficient steel manufacturing, reversing the current risk of business losses due to increasing environmental regulations and potentially leading to additional business opportunities in the future
- Supported by the Technology Centre and Advanced Manufacturing Production Facility, and developments arising from the Property Development Fund, the programme should serve to create a valuable innovation and high technology cluster within the Port Talbot Waterfront Enterprise Zone and wider City Region by demonstrating the growth and success of new and existing businesses within these developments
- Successful demonstration of new and innovative technologies and concepts within the programme will also deliver considerable qualitative value

Proof of concept and demonstration projects are necessarily hard to complete, but it is important for the public sector to take on this role in order to facilitate downstream successful rollouts of these projects by the private sector thereafter. For example, while the use of hydrogen is in its infancy it is difficult to establish a commercially viable proposal for private sector investment. However, proof of concept demonstrations, like the Hydrogen Stimulus Project which will use of excess photovoltaic energy converted to hydrogen for low carbon vehicle fuel, can establish the parameters for successful subsequent private sector investments. As this demonstration will only be possible via the provision of excess renewable energy generation from the energy positive Technology Centre, it is the bundling of projects within the programme that will enable this demonstration to occur.

2.3.9 Place Based Analysis

2.3.9.1 *Positioning and enhancing the green economy cluster*

SILCG projects cater for a range of different potential growth targets of the green economy growth cluster in the Enterprise Zone and the SBCR supporting the development of the South Wales Industrial Cluster as a whole:

- The Technology Centre (TC) will be located on Baglan Bay Energy Park and will target SMEs and spin outs in the research, development and innovation sector with a focus on energy and renewables
- The Hydrogen Stimulus Project will help to position the Hydrogen Centre with its innovative approach to absorbing excess energy and the Technology Centre's innovative approach as an energy positive building
- The Advanced Manufacturing Production Facility which will be located on Harbourside, in the Port Talbot Waterfront Enterprise Zone also targets SMEs and spin outs providing a 'proving factory' facility

There is evidence of demand for the Technology Centre and Advanced Manufacturing Production Facility (AMPF) from two main sources:

- The experience of the Baglan Bay Innovation Centre a c2000sqm facility which currently has 94% occupancy and accommodates research and development, ICT, energy and other small businesses. Some 40% of floorspace is occupied by university spinouts. See Annex 2.5
- Evidence from the Neath Port Talbot CBC business enquiry database, which tracks the status of enquiries to Neath Port Talbot for business accommodation and land. Analysis of the data from December 2019 to December 2020 (see Annex 2.5) suggests a wide range of sizes and types of accommodation are sought. Enquiries for businesses looking for less than 400sqm was about 6500sqm in total of which only about 33% was recorded as completed and 20% of which was not satisfied due to a lack of suitable accommodation. In an unprecedented year such as 2020, with COVID 19 and the uncertainty over the implementation of Brexit, the analysis supports the demand and potential occupation of the facilities

The Property Development Fund which will also be targeted within the Port Talbot Waterfront Enterprise Zone, targets larger size established companies and inward investment with accommodation requirements for larger premises. These may be companies from outside the region and support the target for inward investment, either other UK companies seeking relocation or expansion or from overseas.

SWITCH responds directly to the needs and requirements of the steel and metals sector in boosting R&D activity and scaling up of product developments, responding to regulatory and policy directives for decarbonising steel production and meeting environmental targets. Further details of demand is shown in Annex 2.5.

By targeting different segments of demand in terms of industry sector, size and other requirements the SILCG accommodation will support the acceleration of low-carbon

target growth sectors in the SBCR in line with government and regional policy. The smaller demonstration projects provide focus and support branding of the SBCR as an innovative cluster for the green recovery.

2.3.9.2 Jobs in Neath Port Talbot and SBCR

The four large projects in the SILCG programme together are estimated to accommodate about 900 jobs of which about two thirds are estimated to be additional to the UK. Evidence-based estimates of the number of jobs additional to the SBCR are not available but it is reasonable to assume that the additional number to the SBCR would be considerably higher. These jobs would all be considered to be in innovation sectors or directly supporting innovation in key sectors for the low carbon / green economy cluster including R&D, alternative energy, renewables, information, communication and technology and advanced manufacturing.

Putting the 900 jobs in context (see Annex 2.7), in 2019:

- Total employment in Neath Port Talbot is about 50,000; 900 jobs is about 2% (accommodated, not additional)
- Employment in manufacturing is 9,000 (10%), with about 5,700 (16%) in manufacturing of metals and metal products
- Employment in information and communication is about 700
- Employment in professional, scientific and technical activities is about 1,250

Whilst 900 jobs are not going to change the overall employment profile of Neath Port Talbot or SBCR, for the relevant subsectors and in supporting the innovation and low carbon / green economy agenda, they make a reasonable contribution to Neath Port Talbot.

Neath Port Talbot has an employment diversity index of 0.84, whilst SBCR has a diversity index of 0.86 compared to Wales, 0.88 and GB 0.90. Whilst the direct impact of SILCG on overall diversity and the levelling up agenda will not be large, what is important is the contribution they make to the cluster – and the potential further take-up, reputational benefit and future business development and inward investment they contribute towards.

The SILCG programme has a far greater reach and potential impact than the immediate direct jobs impact. The SILCG programme provides a range of projects, providing test-beds for innovative products and processes, applied R&D to support decarbonisation of the steel and metals sector to support existing businesses and supply chains. It also provides accommodation and support to businesses of different

scales and types covering the spectrum of new start-up businesses to larger inward investors and at the same time increasing the brand and reputation of the SBCR as an emerging low carbon/green economy cluster.

2.3.10 Summary and Conclusions

Table 2.8: Key Findings

		Programme	TC	SWITCH	H2	AQMP	LEV	AMPF	PDF
A Net Present Social Value	£ million	94.7	18.1	29.3	0.0	0.0	0.0	29.6	17.7
B Public sector cost (or appropriate value for cost)	£ million	127.4	8.2	94.8	-	-	-	15.2	9.1
C Appropriate BCR	Ratio	1.6	2.4	1.3	na	na	na	2.2	2.2
D Significant unmonetisable costs/benefits		Full economic costs of counterfactual: erosion of industry base through lower levels of innovation and decarbonisation	Specific product innovation and outcomes of TC tenants and the impact of the TC on their survival and growth. Benefits included in BCR limited to income and productivity	Full economic costs of counterfactual under which the steel and metals industry and significant jobs are at risk	Not included in BCR calculation	Not included in BCR calculation	Not included in BCR calculation	Specific product innovation and outcomes of AMPF tenants. BCR used limited value of research adopting public sector research income as a proxy, other benefits included tenant income and productivity gain	Specific activities of fund recipient not included. Benefits included limited to income and productivity
E Significant unquantifiable factors		Economic implications to SW existing industry base and supply chain without innovation	Specific activities and products/services of TC tenants not known but strong evidence of demand	Economic implications to SW steel & metals industry of not meeting decarbonisation targets on time	Estimates of energy production, usage and carbon savings not known. Influence as a demonstrator and industry take-up of H2 as a result of this project not known	Estimates of implications for improving policy making and future positive impact on emissions and AQ unknown	Estimates of usage and carbon savings to be determined. Influence as a demonstrator and take-up of LEV as a result of project not known	Specific activities and products/services of AMPF tenants not known but strong evidence of demand	Specifically who, timing and take-up of fund not known but strong evidence of demand and take up
F Risk costs by type and residual optimism bias	£ million	4.7	0.8	2.8	-	-	-	1.1	Not included as budget rather than detailed cost estimate at this stage
G Switching values (for the preferred option only)		na							
H Time horizon and reason		30 years operations for buildings. Asset maintenance & overhaul included where known	Facility operational 2022, operations to 2052	Facility operational 2023, operations to 2052	na	na	na	Facility open in 2024, 5 year programme for providing equipment, operations to 2052	Take-up assumed to be 10% 2021, 30% 2022 and 100% 2023, operations to 2052, c30 year building life

2.4 Going Forward

The Economic Case for the SILCG is a living document and as the projects mature, further information may be developed that can be used in the Economic Case, in particular in identifying, quantifying and monetising benefits.

As the programme develops and the projects mature, it may be possible to further expand on the place-based analysis and the potential benefits that arise through the SILCG programme to the low-carbon / green economy economic cluster in SBCR.

3.0 Commercial Case

3.1 Introduction

The Commercial Case sets out the proposed procurement arrangements for delivery of the preferred option, including:

- The proposed procurement strategy and route
- The proposed service requirements and required outputs
- The proposed approach to risk allocation
- The proposed charging mechanisms
- The proposed key contractual arrangements

3.2 Procurement Strategy and Route

The preferred option as specified at the end of the Economic Case comprises seven projects which all involve procurements. The procurement route for each of these projects is set out in the table below:

Table 3.1: Proposed approach to project procurement

Project	Procurement route
Technology Centre	South West Wales Regional Contractors Framework (SWWRCF). 2 stage design and build contract. Contract already procured and awarded to Morgan Sindall.
SWITCH	South West Wales Regional Contractors Framework (SWWRCF). 2 stage design and build contract. Specification at early stages of development. Specialist equipment to be procured by Swansea University in line with Neath Port Talbot CBC Contract Procedure Rules (CPR) (aligned to Public Contracts Regulations 2015).

Project	Procurement route
Air Quality Monitoring Project	Procurement already taken place for sensors.
Hydrogen Stimulus Project	Specialist equipment to be procured by USW in line with Neath Port Talbot CBC Contract Procedure Rules (CPR) (aligned to Public Contracts Regulations 2015). Technical discussions commenced.
LEV Charging Infrastructure	Consultancy to be procured to develop strategy in line with Neath Port Talbot CBC Contract Procedure Rules (CPR) (aligned to Public Contracts Regulations 2015). Vehicles to be procured in line with Neath Port Talbot CBC Contract Procedure Rules (CPR) (aligned to Public Contracts Regulations 2015).
Advanced Manufacturing Production Facility	South West Wales Regional Contractors Framework (SWWRFC). 2 stage design and build contract. Operator to be procured via competitive tendering process. Tender specification being developed with support from Industry Wales.
Property Development Fund	Fund to be advertised via business engagement routes. . Industry awareness sessions to be held.

As lead local authority for the programme, Neath Port Talbot CBC will lead each of these procurements. Neath Port Talbot CBC will therefore be responsible for ensuring compliance with public procurement rules and regulations. The procurement strategy will be aligned to Circular and Foundational Economy principles.

As a public sector organisation Neath Port Talbot CBC has a duty to operate in an open, fair, and transparent way, allowing the market freedom of opportunity to trade with it. Its procedures for procurement are known as 'Contract Procedure Rules'. These are important as they help to:

- Give a legal and auditable framework to its procurement activities;
- Obtain value for money services for the public;
- Ensure the council complies with the law governing the spending of public money;
- Protect its staff and members from undue criticism or allegations of wrongdoing.

The Council also has a legal requirement to comply with EU Procurement Directives (and equivalents post Transition period). These are enforced in UK law through the Public Contracts Regulations 2015. This governs the way in which the public sector procurement process must be conducted for contracts over certain specified thresholds.

The current thresholds are revised every two years. As of January 2020, these thresholds are £189,330 for Supplies and Services, and £4,733,252 for Works contracts.

The regulations are based on the following principles:

- Contracts that exceed the thresholds must be advertised in the Official Journal of the European Union (OJEU) - now known as 'Find a Tender' so that all interested parties in member states have an equal opportunity to submit tenders;
- All enquiries must receive equal treatment in order to eliminate discrimination on the grounds of nationality of the contractor or the origin of the supplies, services or works; and
- All supplier selection, tendering and award procedures must involve the application of objective and transparent criteria.

Public Procurement post Brexit – Neath Port Talbot CBC will ensure all programme procurement complies with revised public procurement laws following the end of the Transition period. (*Green Paper: Transforming public procurement*)⁷²

⁷² <https://www.gov.uk/government/consultations/green-paper-transforming-public-procurement>

3.2.1 Community benefits

The Council and its partners will work in partnership with appointed contractors and their supply chain to deliver 'targeted recruitment and training' outputs as a 'core' requirement of tenders to support the delivery of social, economic and environmental objectives. This involves encouraging:

- Training and the recruitment of the economically inactive by offering apprenticeship;
- Traineeships or work experience opportunities;
- Maximising opportunities for SMEs to tender or bid for sub-contract opportunities;
- Adopting measures to ensure prompt and fair payment terms;
- Encouraging environmental initiatives;
- Engaging with Third Sector organisations; and
- Supporting educational and community initiatives.

In addition, there are collaborative arrangements to coordinate the delivery of community benefits. This leads to adult employability initiatives such as Workways+ and Communities for Work working closely together with organisations such as the local authorities, Department of Work and Pensions, the Further Education sector to identify opportunities to support disadvantaged individuals and help them tackle barriers to employment.

Community Benefits will be monitored during the lifetime of the project.

3.2.2 Swansea Bay City Deal procurement principles

The SILCG programme will align to the Swansea Bay City Deal procurement principles.

The SILCG procurement strategy will address the SBCD 5 Procurement Principles:

1. Be Innovative
2. Have an open, fair and legally compliant procurement process
3. Maximise Community Benefits from each contract
4. Use Ethical Employment Practices
5. Promote the City Deal

3.2.3 Procurement plan

The indicative programme implementation plan (Gantt chart) is included at Annex 5.2. This plan indicates planned and indicative procurement dates shown in the table below.

Table 3.2: Proposed procurement plan

Project component	Procurement design date	Procurement date
Technology Centre – construction	-	Contract awarded
SWITCH – construction	Q2 2021	Q1 2022
SWITCH – equipment	Q2 2021	Q1 2022
Hydrogen Stimulus project – equipment	Q3 2021	Q4 2021
Air Quality Monitoring project – equipment	-	Contract awarded
LEV charging infrastructure – consultant	Q2 2021	Q3 2021
Advanced Manufacturing Production Facility – construction	Q3 2021	Q2 2022
Advanced Manufacturing Production Facility – equipment	Q3 2021	Q2 2022
Property Development Fund – scheme launch	Q1 2021	Q2 2021

3.3 Service Requirements and Outputs

Table 3.3: Service streams and required outputs

Project component	Expected Outputs
Technology Centre	Construction of an energy positive hybrid commercial building (2500 m2)
SWITCH	Specialised open access facility created to enhance applied research for steel & metals industry (4000 m2)
	Provision of specialised equipment to enhance research for steel & metals industry

Project component	Expected Outputs
Hydrogen Stimulus Project	Increase the capacity for hydrogen production at the Hydrogen Centre at Baglan Energy Park
Air Quality Monitoring Project	Procurement & installation of 70 sensors in and around the Port Talbot Air Quality Management Area (AQMA)
LEV Charging Infrastructure	Regional strategy for LEV charging
Advanced Manufacturing Production Facility	Specialist hybrid facility providing a range of industrial / production units with pilot line and office space. (4000 m2)
	Provision of open access specialist equipment advised by industry with academia input
Property Development Fund	Property Development Fund targeted on the Port Talbot Waterfront Enterprise Zone (expected premises created 6000 m2)

3.4 Risk Allocation

Service risks for this programme vary by procurement.

The procurement of the infrastructure projects and specialist equipment all entail standard contract risks.

The procurement of the LEV charging infrastructure consultant entails standard consultancy procurement risks.

Standard lease documentation will be agreed with Swansea University for the SWITCH facility.

Memorandum of Understanding (MoU) will be agreed between Neath Port Talbot CBC and Swansea University in relation to the SWITCH facility agreeing outputs, outcomes and impacts to be delivered.

Memorandum of Understanding (MoU) will be agreed between Neath Port Talbot CBC and University of South Wales in relation to the Hydrogen Stimulus project agreeing outputs, outcomes and impacts to be delivered.

3.5 Charging Mechanism

Appropriate payment mechanisms will be devised as part of each procurement design period.

3.6 Key Contractual Arrangements

Contract terms will be devised as part of each procurement design period.

The Technology Centre, SWITCH and Advanced Manufacturing Production Facility would all be NEC3 Engineering and Construction contracts

3.6.1 Personnel implications

It is anticipated that TUPE⁷³ regulation will not apply to this investment. This is because the programme is not expected to have any impact on the employment of existing staff. The proposed operating model for the programme is outlined in the Management Case and does not include the transfer of any staff.

3.6.2 Accountancy treatment

Assets generated though the life of the Programme will be accounted for and held on the balance sheet of the of Neath Port Talbot County Borough Council. All Local Authorities will account for assets in line with the relevant legislation and regulatory accounting standards.

⁷³ Transfer of Undertakings (Protection of Employment) Regulations 1981

4.0 Financial Case

4.1 Introduction

The Financial Case sets out the funding requirements for the preferred option and demonstrates overall Programme affordability.

4.2 SILCG Investment Summary

The SBCD partnership, through the Smart Manufacturing publication and subsequent discussions with the Welsh and UK Governments, has developed a clear strategy which has been underpinned by identified interventions to deliver widespread and sustainable economic growth across the region. The Supporting Innovation and Low Carbon Growth (SILCG) Programme is a pivotal part of this intervention to deliver low carbon, sustainable and inclusive economic growth for the region through a programme of interlinked projects.

The current investment breakdown presented in Table 4.1. below is based on forecasted investment as of December 2020:

Table 4.1. SILCG investment breakdown

Expenditure	Year 1 (20/21) (£m)	Year 2 (21/22) (£m)	Year 3 (22/23) (£m)	Year 4 (23/24) (£m)	Year 5 (24/25) (£m)	Year 6 (25/26) (£m)	Year 7 (26/27) (£m)	Total (£m)
Capital	£ 3.00	£ 9.17	£ 8.83	£ 30.85	£ 6.65	£ 0.20	£ -	£ 58.70
Revenue	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
Total	£ 3.00	£ 9.17	£ 8.83	£ 30.85	£ 6.65	£ 0.20	£ -	£ 58.70
Funding								
Swansea Bay City Deal Grant	£ -	£ 6.12	£ 5.53	£ 29.20	£ 6.65	£ 0.20	£ -	£ 47.70
Public Sector	£ 3.00	£ 2.50	£ -	£ -	£ -	£ -	£ -	£ 5.50
Private Sector	£ -	£ 0.55	£ 3.30	£ 1.65	£ -	£ -	£ -	£ 5.50
Total	£ 3.00	£ 9.17	£ 8.83	£ 30.85	£ 6.65	£ 0.20	£ -	£ 58.70

Table 4.2. SILCG Project level breakdown

Supporting Innovation & Low Carbon Growth	Funding (£m)								Total	Variance
	Budget	City Deal	NPT	WG	ERDF	Private Sector				
1 Technology Centre	£ 8.50	£ 3.00	£ 1.30	£ 0.50	£ 3.70	£ -	£ -	£ -	£ 8.50	£ 0
2 SWITCH	£ 20.00	£ 20.00	£ -	£ -	£ -	£ -	£ -	£ -	£ 20.00	£ 0
3 Hydrogen Stimulus	£ 2.00	£ 2.00	£ -	£ -	£ -	£ -	£ -	£ -	£ 2.00	£ 0
4 Air Quality Monitoring	£ 0.50	£ 0.50	£ -	£ -	£ -	£ -	£ -	£ -	£ 0.50	£ 0
5 Low Emission Vehicles (LEV)	£ 0.50	£ 0.50	£ -	£ -	£ -	£ -	£ -	£ -	£ 0.50	£ 0
6 Advanced Manufacturing Production Facility	£ 17.20	£ 17.20	£ -	£ -	£ -	£ -	£ -	£ -	£ 17.20	£ 0
7 Property Development Fund	£ 10.00	£ 4.50	£ -	£ -	£ -	£ 5.50	£ -	£ -	£ 10.00	£ 0
Total	£ 58.70	£ 47.70	£ 1.30	£ -	£ 3.70	£ 5.50	£ -	£ -	£ 58.70	£ 0

These figures are the current financial investment forecast which the SILCG programme is currently projecting and are set within the approved revised portfolio update. Funding elements are subject to change as the programme evolves. On the successful approval of the programme business case the Accountable Body will release Government funding to the SILCG programme up to the value of the agreed programme allocation.

It is the aim of the SBCD that all projects and programmes will be delivered in a seven-year period in order to maximise the full benefits realisation of the operational schemes during the lifetime of SBCD funding, which is to be released to the SBCR from both the UK and Welsh Governments over a fifteen-year period.

The SILCG programme has been allocated £53m by the SBCD Programme, this however, was reduced to £47.7m on the approval of a revised programme business case. This is an initial estimate and may evolve over the course of the programme as technologies and market conditions change. Further funding may be sought from the City Deal or other sources in due course, depending on the cost and success of early activities.

The overall investment composition comprises of three following investment components:

- The **City Deal investment** component consists of the government grants awarded by UK and Welsh government totalling £47.7m. City Deal Grant is awarded to Programmes over a fifteen-year term up to a maximum of the allocated value.
- **Public sector** investment consists of investment from local authorities and other public funded and public service organisations. Public sector investment will also consist of specific European grant funding.
- **Private sector** investment includes regional investment from local and national private sector partners.

4.3 SILCG Programme Income and Expenditure Summary

The UK and Welsh Government capital grant contribution to the SILCG programme is awarded over a fifteen-year period and currently forecasted at £47.7m. Funding will only be released from the portfolio on the successful approval of business cases by both the UK and Welsh Governments, up to a maximum of the agreed grant allocation.

An inherent temporary funding gap is recognised with the funding being released to the Programme over a fifteen-year period. Neath Port Talbot County Borough Council as the Programme Lead Authority is responsible for managing the operational cashflows in respect of the Programme. Therefore, subsequently accountable for managing inherent risks and the funding gap recognised.

The Programme expenditure profile is presented in Table 4.2 below with further financial appraisal on the expenditure forecasts at Programme level detailed in Annex 4.1.

Table 4.2: Annual income and expenditure analysis

Programme Spend Forecast																	
Capital/Revenue	Actual	Actual	Actual	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Total
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Total
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	Total
Capital Expenditure				3.00	9.17	8.83	30.85	6.65	0.20	-							58.70
Revenue Expenditure																	-
Total	-	-	-	3.00	9.17	8.83	30.85	6.65	0.20	-	-	-	-	-	-	-	58.70
Programme Funding Forecast																	
Funding Breakdown - Total																	
City Deal Grant Award					6.12	5.53	29.20	6.65	0.20	-	-						47.70
Total	-	-	-	-	6.12	5.53	29.20	6.65	0.20	-	-	-	-	-	-	-	47.70
Public Sector:																	
Neath Port Talbot Council				0.50	0.80	-	-	-	-	-	-	-	-	-	-	-	1.30
Welsh Government Grant				0.50													0.50
WEFO				3.70													3.70
Total	-	-	-	4.70	0.80	-	-	-	-	-	-	-	-	-	-	-	5.50
Swansea Bay City Deal:																	
Private Sector:																	
Industry Providers and Private Developers					0.55	3.30	1.65										5.50
Total	-	-	-	-	0.55	3.30	1.65	-	-	-	-	-	-	-	-	-	5.50
Total	-	-	-	4.70	7.47	8.83	30.85	6.65	0.20	-	-	-	-	-	-	-	58.70

4.3.1 Investment leverage

One of the benefits of City Deal is the ability to lever additional public and private sector investment and to work with existing government funded initiatives and industry partnerships.

As a result of the City Deal investment in specialist facilities and equipment which will improve collaboration between industry, the public sector and academia, it is estimated that the SILCG programme of projects will lever in an additional £10 million of private research income and nearly £30 million of public sector research income over 5 years post construction of the specialist facilities, with increased opportunities for clustering and inward investment.

Table 4.3: Investment leverage over 5 years post construction

Investment Leverage	Year 1 2023/24	Year 2 2024/25	Year 3 2025/26	Year 4 2026/27	Year 5 2027/28
	£	£	£	£	£
Private research	1,849,852	1,896,099	1,943,501	1,992,089	2,041,891
Public research	5,248,235	5,507,905	5,984,513	6,121,625	6,512,166
Total	7,098,087	7,504,004	7,928,014	8,113,714	8,554,057

The programme of projects in the SILCG programme present significant potential for the leverage of further funds. The relevance of the low carbon aims of the programme to national policy suggest that a broad range of further grant funding and potential private investment can be induced as a direct result. In particular, the UK Government's Ten Point Plan for a Green Industrial Revolution highlights a number of areas of alignment with the SILCG programme including:

- Driving the Growth of Low Carbon Hydrogen
- Accelerating the Shift to Zero Emission Vehicles
- Green Public Transport
- Greener Buildings
- Investing in Carbon Capture, Usage and Storage

These low carbon growth opportunities are included in the Energy White Paper 'Powering our net zero future'. Further detail of funding programmes to support these policy measures will emerge.

The SILCG programme will seek to secure funding from the following low carbon funding programmes⁷⁴, and seek to secure additional private sector investment:

- UKRI Industrial Strategy Challenge Fund (ISCF) - Clean Growth Challenge
- Industrial Decarbonisation Fund
- Manufacturing made smarter
- Prospering from the Energy Revolution
- Transforming Foundation Industries

UK Government Funding⁷⁵:

- Net zero hydrogen fund
- Clean Steel Fund
- Strength in Places Fund
- Industrial Energy Transformation Fund (IETF)

4.4 City Deal Funding Profile

The release of funds from the Accountable Body will follow one of two funding routes. This is determined on a programme / project basis, dependant on whether funding is being released to a regional programme / project or a Local Authority programme / project. The flow of funding is shown in Figure 4.2. below:

⁷⁴<https://www.ukri.org/our-work/our-main-funds/industrial-strategy-challenge-fund/clean-growth/>

⁷⁵ <https://www.gov.uk/apply-funding-innovation>

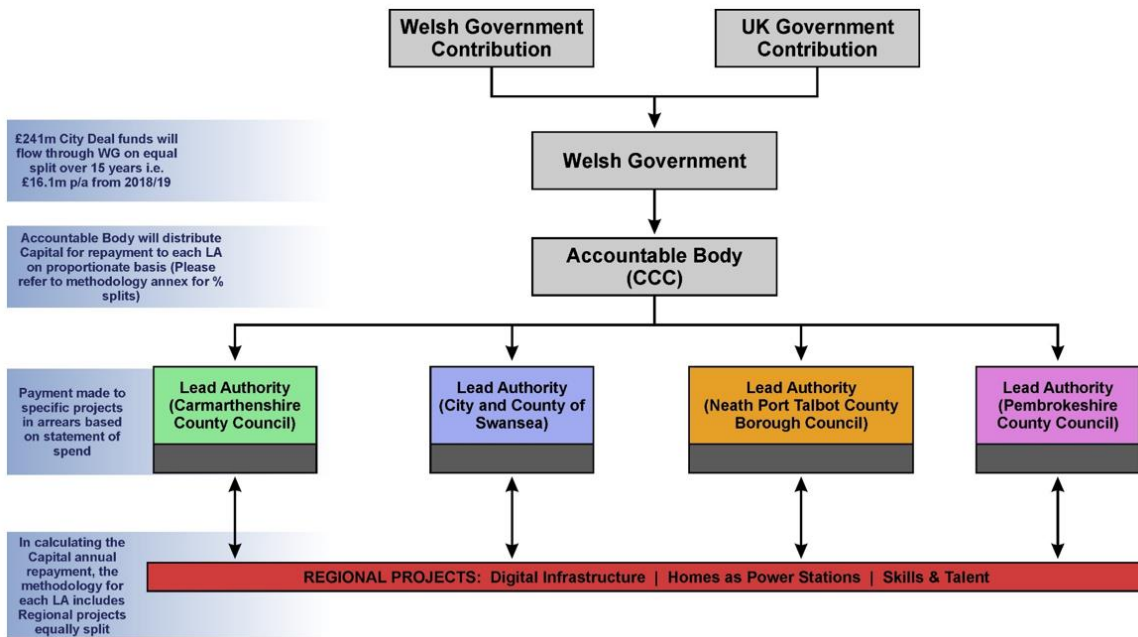


Figure 4.2: City Deal funding flow

4.4.1 Borrowing

NPTCBC is responsible for borrowing to provide funding to support delivery of the SILCG Programme. The capital borrowing (in respect of the Government funded element) for the City Deal Programmes will be re-paid by identified Government funds (UK & Welsh Government) over the 15-year period.

All borrowing will be conducted in line with the principles of the Prudential Code and Treasury Management Policy and Strategy set by the local authority. When further details of the investments required for the Programme are known, a full business case appraisal will be completed and submitted to the relevant local authority governance boards/committees for approval before submission to the Joint Committee. These full business cases will include the detailed funding proposals and requirements of the local authority.

4.4.2 Government Grant 'Top Slice'

Annually, up to 1.5% of the Portfolio Investment Fund, specifically the government grants awarded, will be earmarked to support the Joint Committee and central administration functions required to support the delivery of the Portfolio. This is referred to as 'Top Slice' of Government Grants.

4.4.3 Interest on investments

It is recognised that throughout the lifecycle of the City Deal portfolio, cash balances will arise through cashflow movements as and when Programmes become live and actual expenditure is incurred. Cash balances held by the Joint Committee will be invested through Carmarthenshire County Council as the Accountable Body. Income generated from cash investments will be ring-fenced and redistributed direct to Programmes based on the allocation outlined within the original Heads of Terms.

4.4.4 Retention of National Non-Domestic Rates

Welsh Government have agreed in principle (as per below) 50% of the additional net yield generated through City Deal developments can be retained by the region to support revenue costs associated with the programme. This has been acknowledged by the Lead Authorities within the Joint Committee Agreement (JCA - 29th April 2018).

Welsh Government (Cabinet Secretary for Finance, 11th April 2018):

'I intend to initiate arrangements to allow the region to retain 50% of the additional net yield in Non-Domestic rates generated by the 9 programmes / projects which are to be delivered by the Deal'

4.5 Monitoring and Evaluation

The City Deal portfolio finances will be monitored through the Programme Board and Joint Committee, with the Economic Strategy Board also making recommendations on possible additional funding opportunities or alternative portfolio expenditure. Regular reports will also be presented by the Accountable Body to the regional Local Authority Directors of Finance and Regional Section 151 Officer working group. This working group will, in collaboration with the Welsh Government and the SBCD PMO, agree the financial monitoring process which will be:

- In line with overall reporting processes for the City Deal.
- Based on best practice principles and guidance on Programme monitoring contained within the Green Book.

The monitoring process will allow for the control of Programme cost variations and visibility of variations at a portfolio level.

The monitoring requirements of the Portfolio will require the Programme Authority Lead to submit a claim for Programme funding to the Accountable Body at a frequency to be determined by the Accountable Body. The claim shall include a progress report on the Programme. The progress report shall include an assessment of risks associated with the Programme and details of progress against the agreed outputs. After the parties have agreed in accordance with clause 6.7 of the funding agreement that the Programme has achieved practical completion, the Programme authority lead shall not be required to submit claims for Programme funding. Thereafter, the Programme authority lead shall complete annual monitoring returns in a form to be specified by the Accountable Body prior to the Accountable Body releasing any Programme funding to which the Programme authority lead is entitled. The annual monitoring forms will include an obligation to report on the progress in achieving the agreed outputs. The Accountable Body reserves the right to impose additional monitoring requirements at a frequency and for such period as it considers reasonable in all the circumstances.

In addition to the above monitoring requirement the Accountable Body will require quarterly financial updates on Programme spend to support the cashflow management of the portfolio. These will detail the actual spend to the period, with forecast outturn over the fifteen-year duration of the portfolio.

Programme lead authorities are also obligated to support the Accountable Body with any progress update reporting as required by the Welsh and UK Governments.

4.6 Accounting Treatment of Programme Transactions

4.6.1 Accounting for income and expenditure

All income and expenditure in relation to Programmes outlined within the heads of terms are accounted for within the financial statements of the delivery lead, in this case Neath Port Talbot County Borough Council.

All income and expenditure will be accounted for in line with the relevant legislation and regulatory accounting standards. This will be managed through the accounts and management systems of NPTCBC. Account preparation will be conducted on an accruals basis.

4.6.2 Revenue requirement

The Welsh Government has acknowledged that revenue funding will be required to support the delivery of Programmes within the City Deal portfolio. The revenue requirement by the Programme will be actively managed locally by NPTCBC. The Welsh Government recognises that the four regional local authorities will need to manage their capital funding to enable revenue expenditure to be supported. To achieve this through the use of the Local Authorities' capital receipts, Local Authorities

will reference to the latest direction from Welsh Government Ministers on the use of capital receipts. This was issued under section 15(1) (a) of the Local Government Act 2003, along with accompanying guidance.

4.6.3 Balance sheet accounting

Assets generated through the life of the Programme will be accounted for and held on the balance sheet of the of Neath Port Talbot County Borough Council. All Local Authorities will account for assets in line with the relevant legislation and regulatory accounting standards.

4.6.4 Value Added Tax

Value Added Tax (VAT) is included where appropriate within the forecasts and estimates demonstrated. For objectives delivered by local authorities, VAT is excluded from forecasts and estimates under the application of Section 33 of the VAT act 1994. This Act refunds to (mainly) local government bodies the VAT attributable to their non-business activities and exempt business activities, providing it is considered an insignificant proportion of the total tax they have incurred. Programmes or components of Programmes that are delivered by parties, other than that of local authorities, are subjected to VAT in the manner as regulated by the industry or sector in which they operate, except where regulatory standards dictate a specific treatment or application. Programme business cases will identify and detail the application of VAT and include within forecasts and estimates as appropriate.

Developments will be accounted for in the most tax efficient manner, with specialist advice commissioned to support where necessary

4.7 Financial Risk Management and Assurance

4.7.1 Financial risks

The portfolio financial risks are monitored and managed as part of the City Deal's overall risk management arrangements. The City Deal Programmes and Projects maintain, manage and monitor their own risks in line with guidance from the Green Book and the City Region's Accountable Body and SBCD Programme Management Office. The project operates a risk register and issues log, specifically including any financial risks identified. These risks will be monitored and updated with mitigating control actions through the project board as a standing item and then regularly presented to the Programme Board and Joint Committee, through the Portfolio Management Office.

4.7.2 Financial issues, dependencies and interdependencies

The project board will develop and maintain a log of any financial issues, dependencies and interdependencies at both programme and project level. This log will be considered alongside the financial risk register outlined above. The Accountable Body will work through the Section 151 Officer Working Group to determine any actions necessary to address identified issues and will present recommendations for required action to the Programme Board, Economic Strategy Board and Joint Committee for approval. Regular updates on financial issues, dependencies and interdependencies will also be provided to the Programme Board and Joint Committee via the Portfolio Management Office as appropriate.

4.7.3 Assurance – internal audit

The review of the effectiveness of the system of Internal Control and Governance arrangements is informed by the work of the Internal Auditors, from which the Project Lead Authority and project board gain assurance. Internal Audit is required to undertake their work in accordance with the standards as set out in the Public Sector Internal Audit Standards (PSIAS) established in 2013, which are the agreed professional standards for Internal Audit in Local Government.

As required by these Standards, the Head of Internal Audit as appropriate to the Project Lead Authority will undertake an independent review and report findings to the Project Lead Authority and Project Board. The format of the Annual Report complies with the requirements of the Code of Practice. The Strategic and Annual Audit Plans are approved annually by the Project lead authority and Project board. In addition, the Internal Audit Unit undertakes fraud investigation and pro-active fraud detection work.

4.7.4 Assurance – external regulators

The Audit Wales as External Auditor to the Project Lead Authority reviews and comments on the financial aspects of Corporate Governance which include the legality of financial transactions, financial standing, systems of Internal Financial Control and standards of financial conduct and fraud and corruption.

5.0 Management Case

5.1 Introduction

The purpose of the Management Case is to put in place the arrangements for the successful delivery of the programme. It provides evidence that the capability and capacity is in place to govern and deliver the programme, and arrangements are in place to manage programme risks.

5.2 Programme and Project Management Governance Arrangements

The programme will be delivered using proven programme and project management methodologies to ensure the outputs, benefits and outcomes are achieved in a controlled, well managed and visible set of activities.

The implementation strategy embraces the principles of programme and project management based on proven standards and quality management in line with Managing Successful Programmes (MSP) and Projects IN Controlled Environments (PRINCE2) project management methodologies.

5.2.1 Programme framework

The SILCG programme governance arrangements detailed in the structure below. Each project has its own project team and governance arrangements which align to and provide regular reports to the SILCG governance as detailed below :

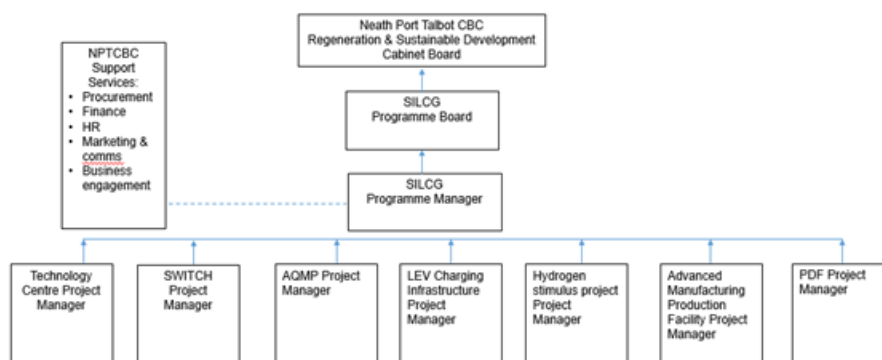


Figure 5.1: SILCG programme governance

5.2.2 SILCG programme board

The SILCG Programme Board governs and oversees the SILCG Programme and reports directly to each of the partner governance structures and the SBCD governance arrangements as per the structure below.

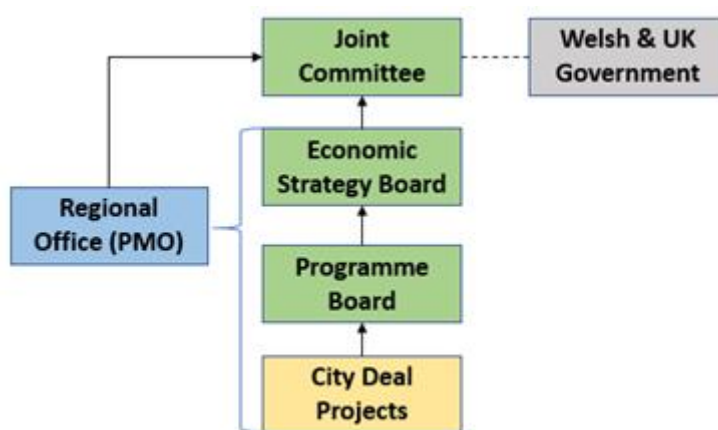


Figure 5.2: City Deal governance structure

The SILCG Programme Board is chaired by the Programme SRO and includes representatives from each of the project partners and the SBCD Portfolio Management Office.

The Board is responsible for:

- Overall strategic decision making and programme leadership,
- The approval of project timescales and plans,
- The approval of key procurements and recruitments,
- Overall project and budget monitoring,
- The allocation of funds between key project components,
- Approval of any major changes to the project,
- Ensuring that benefits are realised (as per the plans set out below),
- Project assurance and post-project evaluation (as per the plans set out below).

Programme Board membership is as set out below:

Table 5.1: SILCG Programme Board membership

Organisation	Name	Role
Neath Port Talbot CBC	Nicola Pearce	Director – Environment and Regeneration Project SRO
Neath Port Talbot CBC	Simon Brennan	Head of Property & Regeneration
Neath Port Talbot CBC	Lisa Willis	European & Strategic Funding Manager Project Manager

Organisation	Name	Role
Neath Port Talbot CBC	Julia Lewis	Strategic Funding Officer Project Coordinator
Swansea University	Dave Worsley	SWITCH
Swansea University	Miles Willis	SWITCH
University of South Wales	Jon Maddy	Hydrogen stimulus project
Swansea Bay City Deal PoMO	Jonathan Burnes	SBCD Portfolio Director

The SILCG Programme Board Terms of Reference are included in Annex 5.1.

5.2.3 Programme SRO

The SRO is accountable for the programme, and for ensuring that it meets its objectives and delivers the expected benefits

5.2.4 Programme team

A Programme Manager will be appointed following the approval of the business case

The Programme Manager will liaise with the project managers for each of the seven interlinked projects, and will drive forward the delivery of the programme and ensure progress towards outputs, outcomes and impacts and linkages to other developments in the region.

5.2.5 Support services

Support services for the programme including HR, legal, procurement will be provided by Neath Port Talbot CBC

5.2.6 Programme plan

The programme plan / implementation plan will be used to control and track progress and delivery of the programme and resulting outputs, outcomes and impact. It describes how, when and by whom a specific project activity, milestone or target will be achieved.

Programme Plan Gantt chart with project Gantt charts is at Annex 5.2

The programme plan summary with key milestones for the next six months is below:

Table 5.2: SILCG programme key milestones

Activity	Milestone	Status
Business case approval	Q2 2021	Under review
Recruitment of Programme Manager	Q2 2021	In progress
Air Quality Sensor installation	Q2 2021	In progress
PDF procurement	Q1 2021	Planned
SWITCH building and equipment specification workshops	Q2 2021	In progress
Advanced Manufacturing Production Facility building specification workshops	Q2 2021	In progress
Hydrogen link technical workshops	Q1 2021	In progress
Low Emission Vehicle strategy procurement	Q2 2021	In development

5.2.7 Outputs, outcomes and impact

Table 5.3 below shows in detail each project's outputs, outcomes and impacts which deliver the SILCG Programme Investment Objectives and programme level impact which will be monitored and reported on.

Table 5.3 Project outputs

Output	Outcome	Impact
Technology Centre		
Construction of an energy positive hybrid commercial building (2500m2)	High quality hybrid commercial premises to meet the need and demand for commercial premises to support economic growth.	Support the diversification of the economy by creating an environment where RD&I and ICT businesses can develop and grow
	Living demonstrator for energy positive commercial mixed-use facility	Supporting shift to energy positive commercial buildings - supporting the Green industrial revolution
	Jobs created (construction)	

Output	Outcome	Impact
	Jobs created / safeguarded (RD&I and ICT sectors) - start-up companies and indigenous business growth. Cluster approach.	Create cluster of RD&I and ICT businesses in the region leading to higher value-added jobs
SWITCH		
Specialised open access facility created to enhance research for steel & metals industry	Establishment of a national applied research centre to support investment in the steel and metals sector.	Increased investment by UK based steel and metal processors and users to reduce carbon emissions
Provision of specialised equipment to enhance research for steel & metals industry		Diversification of the steel & metals industry / foundation industries / circular economy
	Jobs created / safeguarded RD&I in the steel & metals industry supply chain in South Wales and UK	More competitive steel & metals industry in South Wales and UK
	Jobs accommodated	More competitive steel & metals industry in South Wales and UK
	Jobs created (construction)	
Hydrogen Stimulus		
Increase the capacity for hydrogen production at the Hydrogen Centre at Baglan Energy Park	Route map 'spring board' to commercialisation of hydrogen	Economic stimulus leading to further investment in hydrogen and job creation in the green economy
	Route map to increasing the use of hydrogen as fuel.	Complementary hydrogen developments in line with the Welsh hydrogen pathway plan.
Air Quality		
Procurement & installation of 70 sensors in and around the Port Talbot Air Quality Management Area (AQMA)	Pilot project to trial low cost, mobile sensors. Evaluate and validate the sensors with field tests	Proof of concept for low cost, mobile sensors. Industry investment and job creation potential.
	Daily analysis of data with independent quality assurance and quality control	Improved air quality for the area

Output	Outcome	Impact
	Source apportionment of identified pollution to inform selection, implementation and effectiveness of air quality mitigation and intervention measures	Improved mitigation measures and real time mitigation
LEV		
Regional strategy for LEV charging	Coordinated regional approach to decarbonise journeys in the region	Work towards improving the LEV charging infrastructure needs of the region / inc in no. of charge points
	Coordinate funding opportunities	Investment leverage from public and private sector
Advanced Manufacturing Production Facility		
Specialist hybrid facility providing a range of industrial / production units with pilot line and office space.	Hybrid production facility to meet the needs of start-ups and indigenous business growth in the innovation and manufacturing sectors / proving factory concept established	Support the diversification of the economy by providing facilities and a cluster approach for the innovation and manufacturing sector.
Provision of open access specialist equipment advised by industry with academia input	Premises created	Investment leverage (ISCF, UKRI etc)
	Jobs accommodated	
	Jobs created construction	
	Jobs created / safeguarded	
PDF		
Property Development Fund targeted on the Port Talbot Waterfront Enterprise Zone	Premises created	Diversification of the economy and economic growth.
	Jobs created / safeguarded	
	Jobs accommodated	
	Private Sector investment (£m)	
SILCG Programme		
		Jobs created / safeguarded (15 yrs) Green Economy

5.2.7.1 Additional Investment Leverage Opportunities

One of the benefits of City Deal is the ability to lever additional public and private sector investment and to work with existing government funded initiatives and industry partnerships.

The programme of projects in the SILCG programme present significant potential for the leverage of further funds. The relevance of the low carbon aims of the programme to national policy suggest that a broad range of further grant funding and potential private investment can be induced as a direct result. In particular, the UK Government's Ten Point Plan for a Green Industrial Revolution highlights a number of areas of alignment with the SILCG programme including:

- Driving the Growth of Low Carbon Hydrogen
- Accelerating the Shift to Zero Emission Vehicles
- Green Public Transport
- Greener Buildings
- Investing in Carbon Capture, Usage and Storage

These low carbon growth opportunities are included in the Energy White Paper 'Powering our net zero future'. Further detail of funding programmes to support these policy measures will emerge.

The SILCG programme will seek to secure funding from the following low carbon funding programmes, and seek to secure additional private sector investment:

- UKRI Industrial Strategy Challenge Fund (ISCF) - Clean Growth Challenge
- Industrial Decarbonisation Fund
- Manufacturing made smarter
- Prospering from the Energy Revolution
- Transforming Foundation Industries

Source: <https://www.ukri.org/our-work/our-main-funds/industrial-strategy-challenge-fund/clean-growth/>

UK Government Funding:

- Net zero hydrogen fund
- Clean Steel Fund
- Strength in Places Fund
- Industrial Energy Transformation Fund (IETF)

Source: <https://www.gov.uk/apply-funding-innovation>

5.3 Use of Specialist Advisors

Specialist advice has been used for the development of the business case, however the SRO and SILCG Programme Board retain ownership of the business case and its development.

The programme will use specialist advisors in the following areas.

Table 5.4 Programme specialist advisors

Category	Specialist Advice
Business case development	Value People Ltd
Financial	Neath Port Talbot CBC, Financial Services
Legal	Neath Port Talbot CBC, Legal Services
Technical	Swansea University
	University of South Wales
	Vortex IoT
Programme / project management	Neath Port Talbot CBC, European & Strategic Funding Team
	Project Manager to be appointed
Programme / project assurance	Welsh Government Integrated Assurance Hub

5.3.1 Technical Advisory Group

A Technical Advisory Group (TAG) will be established to provide impartial advice to the programme team and partners. The group will include industry experts, academia, government, and utility companies.

The TAG will also consider skills for the green economy and will align to the UK Government Green Jobs Taskforce⁷⁶, which aims to support 2 million green jobs by 2030.

⁷⁶ <https://www.gov.uk/government/groups/green-jobs-taskforce>

Terms of reference will be agreed including declarations of interest and the purpose of the group.

5.4 Change and Contract Management Arrangements

The programme team and SILCG programme board will develop and agree a change control procedure, in line with the PoMO change control procedure. This will provide an acceptable procedure for the delivery of change over the life of the programme to manage anticipated and unexpected change.

Neath Port Talbot will lead on programme procurement activity and has an existing contract management process in place.

5.5 Benefits Realisation Arrangements

The necessary management arrangements will be put in place to ensure that the programme delivers its anticipated benefits. The benefits for the SILCG programme were identified in the Strategic Case and were assessed in the Economic Case. These are the core benefits and form the initial benefits register.

The Programme Manager will develop a benefits realisation plan and benefits register in accordance with the HM Treasury Green Book guidance. The benefits register will be based on the funded outputs and realisation of wider investment objectives and will be an integral part of programme management meetings. The benefits register will be owned by the SILCG Programme Board.

Benefits Register is at Annex 5.3

5.6 Risk Management Arrangements

The Programme Manager will develop a risk management strategy and further develop the risk register. An initial programme risk register has been developed and will be developed further in accordance with HM Treasury Green Book guidance. The programme risk register is aligned to the SBCD Portfolio Risk Register.

The City Deal portfolio risk register is sub-divided into the areas of: development; implementation; operational and financial.

The programme has developed a Covid-19 Impact Assessment which will be monitored alongside the risk register.

The risk register is an integral part of programme management meetings and is attached in Annex 5.4

An initial issues log has been developed and is an integral part of programme management meetings and is attached in Annex 5.5. This aligns to the SBCD Portfolio issues log.

5.7 Programme Assurance

The programme has developed a programme level Integrated Assurance and Approval Plan (IAAP) (Annex 5.6) which is a live document with regular updates.

As detailed in the IAAP the SILCG programme will be subject to Office of Government Commerce (OGC) Gateway Reviews.

The SILCG programme underwent a Project Assessment Review (PAR) in June 2020 and a Critical Friend Review (CFR) in October 2020. The programme received a Delivery Confidence Assessment of 'amber' and the programme team and partners have developed an action plan to address the recommendations of the reviews.

The reports from the Project Assessment Review (PAR) (June 2020) and Critical Friend Review (CFR) (October 2020) are at Annex 5.7 and 5.8.

The Peer Review carried out by David Swallow Consulting Ltd is at Annex 5.9

5.7.1 Monitoring during implementation

An initial monitoring and evaluation plan has been developed (Annex 5.10) which is aligned to the City Deal portfolio monitoring and evaluation plan. This monitoring and evaluation plan will evolve as the programme matures.

The Programme will report on progress to the monthly SILCG Programme Board meetings and will submit monthly highlight reports to the PoMO along with quarterly and annual reports.

5.7.2 Post implementation and evaluation arrangements

The Post Implementation Review will involve a detailed review of the outputs and benefits of the programme. The timescale for carrying out this review after the programme closure will be decided by the Programme SRO and SILCG Programme Board. The review team will be independent to the programme.

The Programme Manager will ensure a Programme Implementation Review and a Post Evaluation Review will be carried out in line with HMT Green Book guidance.

5.8 Contingency Arrangements and Plans

The Programme Manager will have quarterly monitoring meetings with the SRO and Programme Board to review programme progress, risks, issues and performance against targets, timescales and budget.

5.9 Communication and Dissemination Arrangements

There will be a coordinated approach to branding, communications and marketing.

An initial stakeholder mapping has been carried out and stakeholders have been identified from Welsh and UK Governments, industry including Industry Wales, academia in relation to RD&I and skills. This mapping will inform the programme communications plan in line with the good practice example of the power / interest matrix in the diagram below.

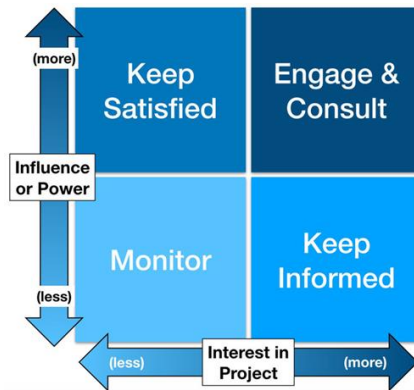


Figure 5.4 Stakeholder power/interest matrix

At pre-approval stage, the following stakeholders have been identified and engagement activity has commenced in developing the programme business case.

Stakeholder	Engagement activity to date
Welsh Government	Policy workshops Project meetings
UK Government	Policy workshops Project meetings
Industry Wales	Regular engagement meetings
South Wales Industrial Cluster (SWIC)	Engagement meetings

An initial communications plan has been developed (Annex 5.11)