HEART OF THE SOUTH WEST: LOCAL INDUSTRIAL STRATEGY

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Executive Summary

Heart of the South West Context

The Heart of the South West is a special place; with an economic output of £35bn per year, 83,000 businesses and a 1.7 million population, it is the equivalent of a major UK city, matched with some of the finest natural capital in the world.

But it is an area which faces huge opportunities and will have challenges in the coming years. The world of work is changing, undergoing a digital revolution which is already opening new previously undreamed of opportunities. Employment levels are high but annual real growth rates have flat lined in the last five years. Continuing economic growth and so raising living standards means a need to drive up productivity across the area. The population is ageing and there is an urgent need to increase social mobility. And the climate change emergency creates an essential imperative to address all this in a different way.

The strategy to address this is to develop a new approach to growth, one where economic growth is decoupled from emissions growth and where the proceeds of economic growth are shared across people and communities. The Heart of the South West is uniquely poised to achieve this; the environment is recognised nationally and internationally as one of the outstanding features of the area. It is also home to world-class businesses and institutions at the cutting edge of the new emerging markets, along with a fabulous balance between 21st century opportunities and a vibrant cultural and outdoor lifestyle.

Vision, Aim and Priorities

The vision for the Heart of the South West economy, as set out in the productivity strategy is to

"raise productivity in order to drive prosperity for all"

Clean Growth is the central tenet of this Local Industrial Strategy, a Strategy which sets out how the Heart of the South West will enable its businesses and people to capitalise on the new opportunities. This will be achieved whilst driving clean growth and ensuring that the proceeds of that growth are more equitably shared across the area. The core mission of this Local Industrial Strategy therefore is *to*

"transform the economy through Clean Growth"

This will be achieved through five key priorities:

Clean businesses		01	Assist businesses to seize Clean Growth opportunities
Clean communities	tţt	02	Develop Clean Growth solutions to challenges in local communities
Clean technologies		03	Deliver environmental improvements through technological solutions
Clean thinking		04	Become a Clean Growth thought leader
Clean and green	*	05	Enhance the natural capital of the Heart of the South West

The strategy will concentrate on the **'dynamic heart'** of the economy, made up of key parts of the economy (clean energy, engineering and digital) where there are significant opportunities to drive up productivity, transform the economy and deliver against national grand challenges.

Harnessing these opportunities and the interplays between them will drive clean, inclusive and productive growth across the area.

Underpinning this, will be action on each of the five foundations identified in the National Industrial Strategy: Ideas, People, Infrastructure, Business Environment and Place.

The structure of the strategy is summarised below:



We will raise productivity to drive prosperity for all to achieve this we choose



This Strategy sets out how this mission will be achieved, building on the area's assets and capabilities and major opportunities for the future. It sets out an ambitious vision and creative, locally focused and joined-up interventions. It is a flexible framework for local, regional, and national collaboration and is built from a robust evidence base.

Core mission: to transform the economy through Clean Growth			
	1	THE DYNAMIC HEART	
	MISSION	OBJECTIVES	
ENERGY FUTURES	The Heart of the South West will establish a globally significant energy cluster, building on assets in new nuclear, off-shore renewables and the transformation of the Heart of the South West's own energy system	 Anchor the nuclear sector in the South West beyond 2025 Lead the R&D effort around the next generation of marine renewables (including floating offshore wind and tidal) Ensure the investment in energy infrastructure to meet clean growth targets will benefit local people and businesses 	
ENGINEERING FUTURES	The Heart of the South West will double the economic output from its engineering and high value manufacturing sector by 2038 to establish a globally significant engineering capability	 Increase innovation and R&D activity within the knowledge base as well as manufacturing and engineering businesses Anchor, grow and attract high value manufacturing and engineering clusters within the area Ensure the investment in energy infrastructure to meet clean growth targets will benefit local people and businesses 	
DIGITAL FUTURES	The Heart of the South West will double the economic output from its engineering and high value manufacturing sector by 2038 to establish a globally significant engineering capability	 Exploit the area's data and research capability to capitalise on the rapid growth of the environmental intelligence market Contribute to the global challenge of 'Sustainable Intensification' Develop the Heart of the South West's marine geospatial innovation market Exploit the combination of big data, research capability and demographics to position the area as a health technology pioneer 	

THE FOUNDATIONS OF PRODUCTIVITY				
	MISSION	OBJECTIVES		
IDEAS	Driving up R&D and innovation across the region in support of the Government's 2.4% R&D target	 Further enhance the Heart of the South West's innovation assets and more effectively connect businesses with the area's knowledge base Become a test bed for innovation to address societal and environmental challenges in rural, peripheral and dispersed communities Foster increased innovation in all businesses to drive growth and productivity 		
PEOPLE	Ensuring a skilled workforce through the Heart of the South West's Skills Escalator approach, securing the opportunities of the future	 Support institutions to increase the take up of Science, Engineering and Maths (STEM) courses amongst young people and adults Ensure all residents have the functional and employability skills (including literacy, numeracy and digital literacy) they need to progress into and within the workplace Increase the take-up of those technical qualifications (including T-Levels and apprenticeships) needed to drive the Heart of the South West's Local Industrial Strategy Improve retention and recruitment of those with technical and higher- level skills through clearer line of sight to local opportunities Increase employer investment in workforce development, including digital skills, leadership and management, through strengthened advice and support services Work with institutions to ensure that the Heart of the South West's learning facilities and teaching capacity are fit for purpose and meeting future need 		
INFRASTRUCTURE	Future proofing its infrastructure to support long term prosperity and clean growth	 Future proof the Heart of the South West's energy system to create an energy future that is low carbon and more affordable, maximising benefits in the region Future proof the Heart of the South West's transport systems to create fast, resilient and clean networks Future proof the digital infrastructure across the whole area, enabling urban and rural areas to compete with the fastest UK core cities Future proof housing delivery to meet housing numbers required for growth, as well as minimise carbon emissions Ensure sufficient employment land for growth 		
BUSINESS ENVIRONMENT	Making the Heart of the South West one of the best areas in which to start and grow a business	 Sustain and develop a strong business support infrastructure, centered around the Growth Hub, by further strengthening support to increase productivity, including starting-up and scaling-up Drive further internationalisation through finance readiness and access, supporting exports and inward investment Stimulate a culture of leadership and management excellence across all of the Heart of the South West's businesses (linked to the skills foundation) Support all business and enterprise to adopt innovations and create new products, services and business models including maximising the Heart of the South West's digital opportunity Support businesses to manage resources more effectively to achieve clean growth 		
PLACE	Ensuring prosperity for all places through Clean Growth	 Facilitate natural capital led productivity growth Develop the Visitor Economy and generate higher value tourism Strengthen innovation systems to maximise knowledge flows and spread the benefits of innovation across the entire geography Work towards all places becoming clean growth settlements Support the development of coastal action zones 		

1. THE HEART OF THE SOUTH WEST

The Heart of the South West is a special place with enormous potential in its businesses, its people and its places. With an economy of £35 billion per year, 83,000 businesses and a 1.7 million population, the Heart of the South West is the size of a major UK city and covers the local authority areas of Devon, Somerset, Plymouth and Torbay.

With 230 miles of coastline, beaches and unspoilt moors, the area is known for its visitor economy, great food and drink as well as music festivals and historic market towns. As well as extensive rural and dispersed communities, the area has a high growth corridor broadly tracking the A38/M5 corridor which links the major population centres of Plymouth, Exeter and Taunton.

The 2016 Science & Innovation Audit confirmed the world-class status of the knowledge base which includes three universities, two medical schools, ten FE colleges, a specialist maths school, the UK Met Office and numerous research centres. Science parks at Exeter and Plymouth are building a cohort of innovation-led businesses alongside this.



The area benefits from a number of exciting high growth opportunities including:

- Advanced manufacturing ranging from aerospace, photonics, and marine engineering;
- The marine cluster, within which Plymouth sits ,with a community of world-class businesses and specialist research organisations;
- The new nuclear power plant being built by EDF Energy at Hinkley in Somerset West and Taunton;
- Expertise and facilities in association genetics, clinical trials and healthcare which provide the base for a healthcare cluster in the field of healthy ageing; and,
- An exceptionally high concentration of climate and environmental science experts, and world class maritime data, cartography and navigation expertise.

The economy will also need to be ready for an unprecedented level of digital disruption that will affect entire systems of production, distribution and consumption. Supported by emerging digital clusters in Exeter, Plymouth and Taunton, Digitalisation is transforming the way consumers discover, purchase and use products and services. Meanwhile, disruptive technologies (e.g. robotics, the Internet of Things, augmented reality, artificial intelligence) are driving a step change in business performance, and allowing businesses to offer once-impossible services [1].

Economy

Despite its strengths, the economy is not as strong as it could be. Although employment levels are amongst the highest in Europe (78.7%), and annual growth rates are now positive, annual real growth rates have flat lined in the last five years are projected to sit below GB growth rates between now and 2038 under the 'do nothing scenario'.



Figure 1: Real GVA Growth in the Heart of the South West and Great Britain

Recent growth has been almost entirely fuelled by growing employment: more people in jobs; more people doing more than one job and more people working longer hours. The amount produced per hour and per FTE remains lower than before the recession (see graph overleaf). As employment levels are high, growth will become increasingly difficult to achieve by raising employment rates and therefore must come from increasing productivity.

Figure 2: Real Growth in FTE Employment and GVA per FTE (2015 prices) Relative to 1998



Drivers of Productivity

There are significant disparities in productivity across the LEP area, ranging from £41,344/FTE in Mid Devon to £54,700 in Exeter and £57,226 in the former West Somerset¹. When considering performance against the Treasury's five drivers of productivity, the LEP performs poorly on a number of indicators.



Looking to the Future

Looking to the future, there are a number of global trends that will impact on the Heart of the South West's economy.

Future of Work

There are likely to be job gains and losses across different industries, as robotics and artificial intelligence (AI) become more prevalent. Reduced numbers of workers in many professional as well as unskilled roles could be partially offset by wholly new jobs emerging [2]. It is said that 65% of children entering primary school today will work in jobs that do not yet exist [3]. Education and training provision will need to nimble and flexible to help provide the creative workers of the future.

Ageing Population

The most significant demographic phenomenon over the next few decades will be the gradual ageing of the population. In the next 15 years, the number of people aged 65+ will double to 1bn globally. In the UK, the number of people at state pension age and older is set to swell almost a third by 2039, to 16.5m. The UK's dependency ratio will increase from 31 today to 37 by 2039 [4]. This will significantly strain public finances and public services. Meanwhile, the population is facing increasing levels of inequality and more people are experiencing poverty and ill health [5]. The graph below illustrates the shift in the age profile in the heart of the South West, which is ahead of the UK aging curve.

¹ The presence of a nuclear power station in the former West Somerset is reflected in these figures, which perhaps do not reflect the nature of the economy in that area as a whole.





Infrastructure

As a more peripheral region with dispersed communities, transport and digital connectivity are particularly important. Parts of the rail network are vulnerable to storms and flooding. Full cable broadband is limited and poor in some rural areas. Mobility is a critical economic factor and is likely to become - with technological development - one of the most important and potentially one of the most disruptive aspects of life in the future. Changing mobility patterns and new technologies are likely to upset traditional ways of predicting, and satisfying, demand. Connected autonomous vehicles (CAVs) [7] and Mobility as a Service [8] will disrupt patterns of distribution and vehicle ownership - and may well bring a marked reduction of vehicles on the road within 10 - 15 years.

Environment

The environment in the Heart of South West is generally of high quality but it is also fragile and susceptible to pressure from development, intensive farming and the changing climate. The world is faced with a number of human-induced environmental threats which are greater than any that humanity has faced before. Wildlife populations have declined by 60% in 50 years, including vital pollinator species [9]. 1 in 14 species in England is at risk of disappearing altogether. The planet's average surface temperature is forecast to rise by 2 to 4 °C over the next 50 years and the rapid warming risks feedback loops that will accelerate the process. The impacts of climate change will be complex and varied. It is estimated that there are only 12 years left to effectively decarbonise our society [10].

These challenges and opportunities, whether of today or a decade hence, demand responses that define how the Heart of the South West will thrive in the future. No part of life will be immune. Every industrial sector will be impacted and will have to find ways to innovate. Whether it will be about devising new materials; drastically reducing energy usage; adapting construction, distribution and production processes; creating different business models; responding to public opinion or embedding new technologies - every company will have to consider how it will restructure its business. And every area will have to consider how to support a rapidly changing economy.

The Heart of the South West understands the task ahead and is ready to seize the opportunities that will be generated by change.

2. LOCAL INDUSTRIAL STRATEGY - FOCUSED ON A CLEANER FUTURE

Heart of the South West Productivity Strategy

The Heart of the South West has ambitious local plans that outline needs and opportunities for housing and economic growth. To accelerate progress towards the ambition and vision, the LEP and the Joint Committee of the local authorities and National Parks set out an ambitious plan – Stepping Up to the Challenge www.heartofswlep.co.uk/about-the-lep/how-we-work/productivity-strategy – which was published in March 2018 and set out more detail on the area's opportunities and challenges.

The Heart of the South West Local Industrial Strategy marks a step change in the Heart of the South West's partnership with central government. It sets out how partners, together with government, will work towards the ambition of the locally led Heart of the South West Productivity Strategy, an ambition that:

"We will raise productivity to drive prosperity for all"

The Local Industrial Strategy

The Local Industrial Strategy forms an important part of the work to realise this ambition, whilst also making a distinctive and important local contribution to the delivery of National Industrial Strategy. By seizing the opportunities presented by a changing global economy, new ways of working and the challenge of climate change, this strategy will enable its citizens to enjoy prosperous lives, fulfilling work and a resilient environment.

The focus for that effort is to deliver a growing economy while reducing the impact on the environment. Together with supporting documents published locally, the Local Industrial Strategy sets out how local partners and central government will build a Heart of the South West area fit for a low carbon future. It is:

- Inclusive
- For the long term
- Informed by many years of economic evidence
- Ambitious and far reaching

The Aim of the Local Industrial Strategy

At the core of the Heart of the South West Local Industrial Strategy is a commitment to grow the economy in ways which will capitalise on new and emerging technologies while reducing the impact on the environment. Working with Central Government, local partners are committed to:

"Transforming the Economy through Clean Growth".

By doing so, the Heart of the South West will become a leader in the delivery of Clean Growth, taking the lead in a new model of environment-driven productivity growth.

3. APPROACH TO GROWTH

The Local Industrial Strategy is an opportunity to focus on key parts of the local economy – effectively "turbocharging" them – in order to catalyse productivity growth and so raise prosperity. Local Industrial Strategies are an integral part of Government's National Industrial Strategy which will drive up productivity through tackling five Foundations of Productivity and four Grand Challenges.

www.gov.uk/government/topical-events/the-uksindustrial-strategy

The Heart of the South West Local Industrial Strategy is based on a robust evidence base, and sets out ambitious plans to address the local challenges across the Foundations of Productivity and corrals local assets to maximise the economic growth opportunity from the Grand Challenges.

The evidence on Heart of the South West's challenges and opportunities is extensive and was published in November 2018 https://heartofswlep.co.uk/about-the-lep/strategies-and-priorities/localindustrial-strategy/

Building on this, the LEP commissioned an independent review of this evidence [11] to highlight which parts of the economy the Local Industrial Strategy might focus on. This demonstrated where the Heart of the South West economy can help deliver the National Industrial Strategy and deliver a cleaner, more productive economy. The review considered the historical strengths of the local economy alongside the major growth areas of the future.

The Dynamic Heart

The review concluded that there are three areas – the "Dynamic Heart" of the economy – where there are significant local assets and global potential (illustrated overleaf).

- Clean energy: associated with technical development for nuclear and offshore renewables, with a hub at the power station site in Somerset West and Taunton but with links to other sectors in chains from Bridgwater to Plymouth and Yeovil to Barnstaple. Offshore renewables provide a link to the coastal and other marine activity centres.
- High-tech engineering: mainly advanced marine and aerospace manufacturing, photonics and defence. There are strategic defence assets in Somerset and Plymouth, a marine cluster covers businesses along the coasts and inland; aerospace supply chains run across the LEP area and photonics is centred on Torbay.
- **Digital futures**: including big data, environmental and health technologies and services, with key assets, such as the



Met Office, the UK Hydrographic Office, the Universities and colleges, and NHS facilities in Exeter, Torbay, Plymouth, Taunton, Bridgwater, Yeovil and their hinterlands.

The three broad areas centred on here relate closely to the government's Grand Challenges of Artificial Intelligence, Clean Growth & Future of Mobility. The demographic challenge within Heart of the South West and the identified strength in digital futures and advanced manufacturing also offers an opportunity to address the Ageing Society Challenge. As illustrated overleaf, the areas of overlap between these sectors, offer links to wider parts of the Heart of the South West economy, as well as niche opportunities for innovation and cross-over.

4. Clean Growth

The Government's Clean Growth Strategy states that:

Clean Growth means growing our national income while cutting greenhouse gas emissions. Achieving Clean Growth, while ensuring an affordable energy supply for businesses and consumers, is at the heart of the UK's Industrial Strategy. It will increase our productivity, create good jobs, boost earning power for people right across the country, and help protect the climate and environment upon which we and future generations depend (The Clean Growth Strategy, 2018).

As set out in the National Industrial Strategy, the move to cleaner economic growth, through low carbon technologies and the efficient use of resources is *'one of the greatest challenges and industrial opportunities of our time'*. The opportunity for people and business across the country is huge. The low carbon economy could grow 11 per cent per year between 2015 and 2030, four times faster than the projected growth of the economy as a whole.

Heart of the South West Will Take a Lead on Clean Growth

The Heart of the South West is in a unique position to take the lead on Clean Growth, capitalising on an unrivalled set of industrial assets and opportunities:

- World-class research capability in our universities and research organisations, developing new products and services aligned to Clean Growth, including:
 - The Met Office with one of the most powerful environmental super computers in the world, providing long term, detailed global climate prediction and Big Data
 - The UK's first Marine Energy Park, the Marine Institute at Plymouth University, as well as Plymouth Marine Laboratory (ranked 8th in the world as Reuters' oceanography research)
 - SAHFOS, which runs a global ocean instrumentation platform surveying 20,000km of ocean per month
 - o The University of Plymouth's Marine Systems Research Group
 - The South West Partnership for Environmental and Economic Prosperity (SWEEP)
- Two Enterprise Zoned with a focus on Clean Growth (Gravity, Exeter and East Devon) as well as other assets such as the Somerset Energy Innovation Centre that align with this opportunity
- Hinkley Point C and the growth in offshore renewables provide a multi-billion pound Clean Growth focus for the engineering and manufacturing sectors
- The South Coast Marine Cluster stretching from Cornwall and the Isles of Scilly to Hampshire is focused on the opportunities in marine renewables and marine autonomy and the photonics capabilities in the area support this focus
- Extensive data assets and world-class expertise to underpin a drive to Clean Growth, including the UK Hydrographic Office in Taunton; a global leader in marine geo-spatial data, poised to exploit vast commercialisation opportunities relating to the 'blue economy'.

Alongside these industrial strengths, the region boasts a disproportionate share of the UK's finest natural capital including: 230 miles of coastline, two of the UK's ten National Parks, eight of the UK's 46 Areas of Outstanding Natural Beauty (AONBs) along with 382 Sites of Special Scientific Interest (SSSIs) and hundreds of National Nature Reserves (NNRs) and Local nature Reserves (LNRs), Marine Conservation Areas, a biosphere reserve, a UNESCO geopark, as well as two World Heritage Sites and a National Marine Park, as illustrated overleaf.

These natural assets support much of the Heart of the South West economy including agriculture, food and drink and tourism sectors; they are why so many people want to live and work here, and they provide important eco-system services - carbon sinks, flood management, pollination, clean air etc. which all support our economic growth.

The importance of natural capital is recognised in the National Industrial strategy, which states that:

"we will work not just to preserve but to enhance our natural capital – the air, water, soil and ecosystems that support all forms of life since this is an essential basis for economic growth and productivity over the long term"

Conservation of the natural capital base and the flow of environmental services from that base is an important ingredient in the sustainable and sustained potential for local economic development.



If these crucial assets, on which society and the economy depend, are maintained and enhanced it will bring continued dividends now and into the future.

Why is Clean Growth Important?

Ever since the launch of the UK's Industrial Strategy last year there has been accumulating evidence about the threats posed by climate change, biodiversity loss, acidification of the oceans and rapidly reducing soil fertility, which all pose threats to economic growth and productivity in the long term. There is therefore an economic imperative to find ways to decarbonise the economy and de-couple carbon emissions from economic growth. Doing so also presents a huge economic opportunity for new, high value jobs; disruptive businesses ideas and innovative technologies. There is no more important challenge.

Why Clean Growth?	How will Clean Growth be delivered?
It is an area in which Heart of the South West can demonstrate national leadership	Driving clean innovation through the 'dynamic heart'
The Heart of the South West has great assets – intellectual, entrepreneurial and physical	Using technologies from the 'dynamic heart' to enhance delivery of Clean Growth
It is a tool to drive productivity and efficiency	Using Clean Growth to transform bedrock sectors
It unifies the wider offer	Getting infrastructure ready for the cleaner, greener future needed
It is a local, national and global imperative	Working with Heart of the South West's neighbours to find and deliver the best solutions

This mission and the central aim: **to transform the economy by choosing Clean Growth** will be achieved through these five key priorities:

Clean businesses	0	01	Assist businesses to seize Clean Growth opportunities e.g. Become a net exporter of electricity by 2030
Clean communitie	tţt	02	Develop Clean Growth solutions to challenges in local communities e.g. Digital service delivery
Clean technologies		03	Deliver environmental improvements through technological solutions e.g. Low carbon clusters
Clean thinking	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	04	Become a Clean Growth thought leader e.g. A step change in leadership
Clean and green	*	05	Enhance the natural capital of the Heart of the South West e.g. 25 year environment plan

Each of these priorities will be delivered through a range of actions throughout this Local Industrial Strategy, aligned to the opportunities presented below:

	Driving Clean Growth through the economy	Sample actions
CLEAN BUSINESSES Assist businesses to seize Clean Growth opportunities	 Seizing Clean Growth opportunities by Developing clean energy technologies including nuclear, marine, solar and geothermal and autonomous systems Capitalising on clean energy infrastructure upgrades in the SW to promote clean growth start-ups and growth Commercialising environmental intelligence and geospatial opportunities and their applications to other sectors such as agriculture 	 Become a net exporter of electricity by 2030 Innovation in marine and other renewable technologies
CLEAN COMMUNITIES Develop Clean Growth solutions to challenges in local communities	 Developing Clean Growth solutions to challenges such as: De-carbonising the Heart of the South West economy Responding to needs of future energy systems Addressing fuel poverty and hard to treat homes Health and ageing population Monitoring extreme environments 	 Improved digital coverage to improve connectivity, whilst reducing emissions Future proof transport systems for future of mobility and electrification Pilot local energy grids that are locally managed
CLEAN TECHNOLOGIES Deliver environmental improvements through Clean Growth solutions	 Delivering environmental improvements through: Digitisation of the energy sector Cleaner manufacturing processes, such as lean design and circular systems Developing 'cleaner' products Application of autonomous inspection and maintenance systems Establishing partnerships for accelerating clean tech adoption across sectors 	 Business resource efficiency Reduce emissions from housing stock through retrofitting, heat networks and low carbon design Industrial digitisation
CLEAN THINKING Become a Clean Growth thought leader	 Building our Clean Growth economy will help our policymakers, industry leaders and stakeholders: Understand how to adopt clean tech practices and the economic and environment benefits associated with clean technologies. Identify and address some of the barriers and obstacles that are inhibiting investments in clean technologies Learn from best practice where adoption is driving investments in innovation and supporting the growth of clean tech SMEs 	 Development of clean growth settlements
CLEAN AND GREEN Enhance the natural capital of the Heart of the South West	 Securing economic growth through natural capital through: Identifying opportunities for and promoting eco-systems trading Growing the green economy Building natural capital into decision making, including recognition of economic costs (loss of pollinators) and benefits (e.g. flood prevention) 	 Develop a 25 year Environment Plan Trial a local payment scheme for ecosystem services (PES) which can provide incentives for carbon sinks

5. And Delivering Inclusive Growth

The drive for greater productivity is a catalyst to enable more people to contribute to and benefit from future growth. To be effective it must address the social, spatial and environmental issues affecting the Heart of the South West's communities. In an era of high employment the historic tactics of more jobs and output growth will not achieve the end result so it is essential to get businesses and public bodies to engage around these emerging risks and opportunities in a new inclusive way that truly supports the economy and communities throughout the Heart of the South West. The solution is to embrace the concept of inclusive growth for inclusive futures, focusing on long term solutions for social and spatial challenges.

Inclusive growth is therefore embedded as a contributor to the success of this strategy and not simply a beneficiary of it, with a commitment to 'mainstreaming' inclusive growth across all strands of the Local Industrial Strategy. This will enable more people across the labour market, including those who face barriers to higher paid employment, to benefit from the increased productivity, addressing inequalities in opportunities between different parts of the Heart of the South West.

Success in designing and delivering the benefits of inclusive growth will require innovative and untested approaches to be utilised. The LEP will create an **Inclusive Growth Task Force** to accelerate and mobilise its plans, led by a senior level Inclusive Growth Champion. The internal structures and methodologies will be put in place to take this work forward, co-ordinating externally with the area's 'anchor organisations' who have by their employment, role or size the potential for significant impact on inclusive growth activities in relation to LIS projects or objectives. This will lead to a change in the profile, practice and perception of inclusive growth, underpinned by measurable impact on the priorities that matter, and that can be seen in the area's people and communities.

The LIS 'architecture' of foundations and grand challenges will provide the means by which inclusive growth ideas, projects and activity can be developed with a clear and direct focus on inclusion priorities. A consistent inclusive growth methodology will be used throughout the project lifecycle to guide project inception, development, procurement or commissioning, delivery and ultimately the evaluation of interventions. This will provide the platform to extend and integrate inclusive growth activity across all LEP activity, strengthening and progressively building the Heart of the South West LEP's reputation as an inclusive growth leader.



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Part 1: Delivering Clean and Inclusive Growth through the Dynamic Heart

The following chapters in this Local Industrial Strategy set out in detailed commitments across the three areas of the Dynamic Heart as described above. The table below summarises the actions to support clean and inclusive growth across these areas.

	Supporting Clean Growth by	Supporting Inclusive Growth by
Energy Futures The Heart of the South West will establish a globally significant energy cluster, building on assets in new nuclear, off-shore renewables and the transformation of Heart of the South West's own energy system	 Ensuring the nuclear sector is able to capitalise on global nuclear opportunities Securing nuclear fusion demonstrator Driving innovation in marine renewables and other low carbon technologies for use worldwide Increasing capacity through business growth and enterprise to respond to the energy transformation opportunity 	 Providing job opportunities across the full range of skills levels with opportunities for progression for all Providing opportunities for enterprise and business start-ups in the clean energy sector Providing lower cost energy solutions that address fuel poverty Providing community energy solutions that bring income into communities
Engineering Futures Engineering Futures The Heart of the South West will double the economic output from of its engineering and high value manufacturing sector by 2038 to establish a globally significant engineering capability	 Developing innovative products and services to serve clean growth markets (e.g. marine autonomous systems) Developing cleaner manufacturing processes (e.g. industry 4.0) 	 Providing job opportunities across the full range of skills levels with opportunities for progression for all Providing opportunities for enterprise and business start-ups in the engineering sector
Digital Futures Digital Futures The Heart of the South West will develop a strategically significant digital cluster, trail blazing into major growth markets	 Developing products and services that enable clean growth across a number of sectors (e.g. agriculture, health etc.) Developing an environmental intelligence cluster exploiting the power within data to optimise environmental decision making 	 Providing job opportunities across the full range of skills levels with opportunities for progression for all Providing opportunities for enterprise and business start-ups in the digital futures sector Digital initiatives in wider sectors such as health and social care will improve the experience for end users

6. ENERGY FUTURES

MISSION

The Heart of the South West will establish a globally significant energy cluster, building on assets in new nuclear, off-shore renewables and the transformation of Heart of the South West's own energy system

To realise the Energy Futures Mission, the Heart of the South West aims to:



Energy: A growing global opportunity

Rising global demand for clean energy will drive technological innovation, create new high value jobs and stimulate business start-ups in a new, technologically innovative, high growth and high value 'low carbon sector' across the UK. The Heart of the South West is well placed to capitalise on this global opportunity, with an established nuclear energy cluster, as well as a scientific research base with nationally leading expertise in marine renewables [12]. The Heart of the South West has an ambition to lead the UK in the successful exploitation of these technologies, making a significant contribution to the national Clean Growth Strategy, as well as the forthcoming Energy White Paper.

Anchor the nuclear sector in the South West beyond 2025

The Heart of the South West is home to the first new nuclear power station in 20 years: Hinkley Point C (HPC) in Somerset, which will provide low carbon electricity to more than 6million homes and represents a huge industrial opportunity for the region [13]. However, with the build expected to be complete by 2025, there is a need to secure further market opportunities to ensure the legacy of the HPC project.

Nuclear opportunities

The South West region has the largest number of nuclear licensed sites and several reactors that are in varying stages the reactor life cycle as well as a longstanding nuclear defence sector. Research in 2015 [14] found that:

'there are significant and sustainable growth opportunities for the nuclear industry in the South west region over the next 20 years and beyond. A programme of 15 major nuclear industry projects (including new build, existing stations, decommissioning, submarines and nuclear medicine) will be undertaken in this period with activities centred within the region and representing investment worth up to £50bn'

At a global level, markets for nuclear are also expected to grow as countries look for secure, reliable and affordable energy sources that do not contribute to climate change. As the UK has some of the highest nuclear standards in the world, UK companies that are able to meet UK nuclear standards are well placed to take advantage of these worldwide export markets [13]. By anchoring the nuclear sector in the Heart of the South West, the area will be positioned to seize these global export markets and boost the value of exports from the area. As well as the nuclear new build projects, the market opportunity for nuclear in the South West includes:

- *Decommissioning* With four sites in the South West undergoing decommissioning there is scope to improve participation from South West companies in decommissioning. As well as the nuclear sector, there are important opportunities for cross sector innovation in the fields of autonomy [13].
- Defence Many aspects of civil and defence nuclear programmes are similar or related, with transferable skills. Nuclear defence activity is expected to continue beyond the 2050's with the construction of a new class of submarine, providing longer term opportunities. Devonport in Plymouth is the only facility in the UK licenced for submarine refit, refuel and defuel, with 3,200 people employed in the sub-marine and naval reactor programmes.

Building on considerable public and private investment and the Nuclear Sector Deal

There has been significant public and private sector investment in assets and infrastructure to support the HPC project and wider low carbon energy technologies in the Heart of the South West and wider region including [13]:

- The National College for Nuclear (Southern Hub) (NCfN)
- Hinkley Point Skills Alliance
- EDF National Learning and Development Centre
- Hinkley Supply Chain Team
- Gravity Enterprise Zone
- Somerset Energy Innovation Centre

Aligned assets in the wider region include the South West Nuclear Hub at Bristol University as well as the HPC supply Chain Innovation Lab at Bath University as well as the Office for Nuclear Regulation in Cheltenham. Together, the assets across the region form *Nuclear South West* providing a vital collaborative asset which aims to maximise the economic legacy.

CASE STUDY: NUCLEAR SOUTH WEST (NSW)

NSW brings together, as a cluster, key industry, academia, education and government stakeholders from the nuclear sector. NSW co-ordinates dialogue between stakeholders providing the region with one unified voice for existing and developing projects. NSW meets with government departments and industry to maximise industrial competitiveness, research and innovation and promote skills in the region. NSW aims to secure government and private investment with a long term goal of maximised economic legacy. It also works to communicate with LEPS outside the SW, as well as European Nuclear Clusters paving the way for wider collaboration, learning and trade opportunities.

The *Nuclear Sector Deal* represents a significant opportunity for the South West to grow the region's nuclear economy and it is important that the South West capitalises on these opportunities. The Nuclear Sector Deal recognises the importance that nuclear has to Place within these mostly rural geographies, and has encouraged the LEPs to work collaboratively with Industry to roll-out regional activity relating to supply chain and skills

Nuclear Futures – Bringing Fusion Technologies into the Area

Looking to the future, the UK Atomic Energy Authority (UKAEA) mission is to lead the development of fusion power and related technology, positioning the UK as a leader in sustainable energy and the associated technologies. Government investment in fusion research will reinforce the UK's world-leading fusion research and development capability, and allow UK firms to compete for up to £1bn of international contracts for fusion technologies. There is therefore a unique opportunity for UK businesses, including SMEs and academia to develop the materials, processes, facilities and machines to respond to the fusion opportunity [13]. Building the legacy of HPC and the full range of existing nuclear assets, including licenced sites and research capabilities, partners in the *South West have an ambition to host the world's first commercial fusion power plant*. This would establish the UK as the defacto global leader in Fusion power technology as well as providing re-deployment opportunities for the HPC supply chain and workforce.

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Anchoring the Nuclear sector in the South West beyond 2025

The nuclear sector and workforce in the South West is highly dependent on the HPC project. Without further new build projects in the region, there is a risk that the hard won expertise and skills now present in the region will be lost. There is therefore a need to anchor this high value sector in the area in the long term and provide opportunities for re-deployment of the HPC supply chain beyond the initial build phase (2025), through facilitating a pipeline of long term opportunities such as decommissioning, defence and fusion, as well as wider deployment into other energy and engineering sectors in the South West.

Anchoring the sector in the area will:

- Safeguard productivity, as jobs in the nuclear jobs are highly productive
- Contribute to clean growth through the development of low carbon energy
- Allow businesses to seize lucrative global export markets

To achieve this ambition partners in the South West will:

- Continue to work with Nuclear South West partners to implement the Nuclear Sector Deal in the South West
- Secure investment in the South West Nuclear Energy Technology Pipeline Project

The **South West Nuclear Energy Technology Pipeline Project** [15], is supported by Nuclear South West and by 5 South West LEPs and industry. The project will support businesses through adaptable facilities across the region, with mulitple entry points appropriate to the full range of technology readiness levels and will draw on nationally leading expertise and applied nuclear research through the South West Nuclear Hub. Supplemented by a unique link to fusion through the Bristol-Oxford Nuclear Research Centre, it will also leverage innovation in nuclear fission to help the UK win a greater share of international fusion projects. The project will and align and add value to the Nuclear Sector Deal, the ISCF Grand Challenges as well as other national assets such as the Nuclear Advanced Manufacturing Research Centre. The aim is to create a seamless technology pipeline for nuclear across the region and is illustrated below.



Lead the R&D effort around the next generation of marine renewables

A Growing Global Ocean Economy with significant growth in Marine Renewables

The OECD Global Ocean Economy 2030 report [16] predicts that the 'ocean economy' will reach US\$3trillion by 2030, more than doubling its 2010 contribution with offshore wind predicted to be one of the biggest areas of growth. Within the UK, the Ocean Economy it is estimated to be worth £47bn or 2.7% of total UK [17]. The South Coast Marine Cluster, accounts of 8% of the UK's maritime GVA and 10% of employment – more than any other recognised UK cluster or region [18]. Within the Heart of the South West output from the marine sector is 25% higher than the national average and 10 x higher in Plymouth.

The South Coast Marine cluster reaches from Cornwall to Hampshire and is a partnership of industry, academia and the public sector, set up to champion and grow the South Coast industry as the premier destination for investment, innovation and growth. Working at a regional scale this body provides an important mechanism for securing greater impact.

Within the Ocean Economy, the offshore wind sector is expected to be one of the biggest areas of growth globally and the UK has the largest installed offshore wind capacity of any country in the world [17]. Aligned to the offshore wind sector is the growth in marine autonomy and robotics, which is expected to be the most significant technological development for the marine economy, transforming the majority of marine industries and sectors [17] and where the Heart of the South West has expertise and capabilities (see engineering futures).

As well as offshore wind, UK waters have the potential to provide energy in other ways, including through *waves*, *tidal, ocean currents and temperature and salinity gradients*. Mainland UK waters are among the best in the world for wave and tidal energy resource, holding 50 per cent of Europe's tidal resource and *wave and tidal energy has the potential to meet up to 20 per cent of the UK's current electricity demand*. The industry is still emerging, but the UK is currently leading the development of related technology and there are presently around 1,700 people employed in the sector in the UK [17]. If the challenges to development can be overcome, there are opportunities to grow the sector and export UK products and expertise [17].

Home to Major Marine Research Centres and Testing Facilities

The Heart of the South West is home to major research centres and testing facilities relating to marine renewables and marine autonomy, with significant synergies across institutions and the wider region. Through early investment and nurturing of marine assets by the public and private sector, the area has a scientific base that is unrivalled in the UK. Both Exeter and Plymouth universities have marine energy expertise and regularly collaborate on marine energy projects and the University of Plymouth is currently leading the national effort in Offshore Renewable Energy (ORE), through the *EPSRC funded Supergen ORE Hub*. This research base, aligned with development sites for floating offshore wind and tidal streams across the North Devon, Somerset and Cornish coasts mean the region is well placed to respond to this opportunity.

Underpinning marine manufacturing capabilities with high levels of productivity

The sector also has a wider underpinning and enabling capability in manufacturing for the marine environment, including large scale fabrication in steel and concrete as well as manufacturing services in plastics and composites. Born out of the aerospace and yacht building industry, the region has developed significant expertise and capability in the design and manufacture of complex composite structures [12].

The Heart of the South West has an ambition to lead the next generation of marine renewable development. This will build on the substantial natural capital, research and commercial assets that already exist in the area and have the potential to provide a clean growth win-win for the area and the UK. By bringing down the cost of renewable energy deployment marine renewables will contribute to decarbonisation. Equally, commercialisation of these technologies within the South West will lead to Clean Growth opportunities for the area's marine and wider engineering businesses. Further, driving growth in the Heart of the South West Marine sector will contribute to productivity improvements as the marine sector and offshore renewable energy sector in particular, has higher than average productivity levels [19].

To achieve this ambition partners will:

- Continue to work with the South Coast Marine Cluster to take forward marine renewables initiatives at a regional scale.
- Secure funding for the Mayflower Centre for Offshore Renewable Energy (MCORE)

The **Mayflower Centre for Offshore Renewable Energy** (MCORE) will exploit the University of Plymouth's research excellence in offshore and coastal engineering to build a vibrant community of international researchers who, by collaborating across disciplines, will generate innovative and impactful advances of global significance.

MCORE will exploit its national and international reach, in collaboration with established partnerships comprising both industry primes and SMEs and will directly influence and benefit discipline interfaces within engineering, including hydrodynamics, big data/AI/machine learning, materials and structures, robotics/autonomous systems and cybersecurity, as well as enabling the burgeoning ORE sector in the UK to become truly world leading.

Development of this Centre will complementing existing research investment and facilities in the Heart of the South West and wider region (including the Oceansgate Enterprise Zone at South Yard and the Wave Hub in Cornwall and Isles of Scilly).

Ensure the investment in energy infrastructure to meet clean growth targets will benefit local people and businesses

The South West's Energy System requires a radical transformation to meet carbon targets

To achieve legally binding carbon targets to 2050, the South West's energy system needs to *undergo a radical transformation* [20], moving from a siloed, autonomous and centralised system to one which is localised, flexible smart and integrated. For instance, Electric Vehicle charging will place increasing demand on the distribution system, which in turn will benefit from local storage and demand side management solutions. *Smart technologies* will be required to unlock these inter-dependences and new entrants including community companies may disrupt the dominance of the 'Big 6' energy companies [20].

Transforming the energy system will be a considerable challenge

At the current time, the region is importing 88% of its energy and spending £9bn in the process, resulting in higher energy bills for consumers as well as businesses [20]. Improving self-sufficiency (especially through community led schemes) would retain income in the area, create business opportunities and improve productivity (through lower energy costs). Despite the scale of the challenge, the area is not starting from ground zero. There has been significant investment in renewable energy technologies and innovative energy systems across the area, which means that both Devon and Somerset have higher than average renewable energy capacity [21]. However, significant further infrastructure investment will be required to meet carbon targets. At the same time, investment in innovation will also be required to develop, test and commercialise new energy systems and technologies needed to respond to this challenge. By stimulating and leading on this innovation, the area will be able to commercialise products and services that can be sold throughout the UK and the world.

The transformation will create opportunities in the region

Research conducted as part of the development of the SW Energy Strategy [20] found that the transition to a low carbon energy system is likely to create potential opportunities for businesses in the South West. The research found that to achieve the legally binding carbon targets to 2050, *between £275bn and £340bn would need to be invested*, with between £106bn and £132bn likely to be retained in the region, creating over 500,000 high value jobs. Whilst there is an emerging low carbon energy sector, the *scale of the transformation required will require significant supply chain growth* [22]. The investment to transform the South West's energy infrastructure is of a massive scale but the region is not alone in this challenge, as other regions in the UK and the world are also likely to require significant investment to reach their targets.

The Heart of the South West has an ambition to ensure that this investment in energy infrastructure benefits local people and businesses by enabling them to access this significant commercial opportunity. Achieving this will:

- Drive up productivity by increasing the number and size of businesses operating in this high value sector, providing high quality opportunities for people
- Stimulate the development of innovative products and services than can be sold to UK and global markets.
- Contribute to both the UK and the Heart of the South West's Clean Growth ambitions

However, without public sector intervention to stimulate growth of local supply chains, develop new business and financial models and catalyse innovative activity, the targets will not be met and the opportunity will not be captured by businesses in the area.

CASE STUDY: CRANBROOK HEAT NETWORK

District heating forms a key part of the infrastructure serving both the Cranbrook new community and Skypark strategic employment site (1.4m sq ft of office and industrial space). With no gas on site, all hot water and heating needs are met from the network which connects to each building. This was part of the overarching sustainability strategy as it enables the large scale delivery of zero carbon development. The roll out of the network began in 2011 and a second network serving the Monkeron/Tithebarn Green area including Exeter Science Park was secured in 2015.



Today there is over 100 km of heat pipe in the ground, representing an investment of over £50m by energy company E.On. An energy centre at Skypark has been operational since 2013. Currently gas fired, including combined heat and power, work is underway to determine the future zero carbon energy source. A second energy centre at Monkerton is due to be commissioned by the end of 2019. Together the two networks are expected to serve over 10,000 homes and 2m sq ft of commercial space which represents one of the largest zero carbon development areas in the country.

The presence of decentralised energy networks offers the potential to utilise different energy sources. This includes waste heat that would otherwise be lost to the atmosphere. There is already a private wire connection between the Skypark energy centre and the nearby Lid

regional distribution centre. Going forward this has the potential to support wider objectives, such as the electrification of transport, and to underpin the delivery of clean growth more generally.

To achieve this ambition partners in the South West will:

- Develop a supply chain project to increase capacity in the Energy Systems Supply Chain to respond to energy infrastructure opportunity
- Secure investment to develop, test and commercialise new energy technologies to help meet carbon targets, including development of local energy markets

To capitalise on the energy system transformation opportunity and retain investment in the area, the energy systems supply chain will need to scale up. Using experience from the Hinkley Supply Chain development project (see case study in Engineering Futures), partners will develop a supply chain programme aligned to forecasted technology and infrastructure capacity needs. This will support growth of existing businesses as well as start-ups in this sector. Alongside this, partners will continue to secure investment to develop, test and commercialise new energy technologies (including solar, biomass, low carbon design, district heating, heat networks, smart energy systems and energy storage) and business models by working closely with the South West Energy Hub (See Foundations: Energy) to respond to the need for further innovation and R&D.

Summary: Energy Futures	5		
ENERGY	Global	National	Local
FUTURES	Growing demand for clean energy Rapid growth in 'Marine Economy'	Demand for clean energy Nuclear decommissioning Defence (nuclear)	Demand for clean energy Offshore renewables potential Geothermal and land
Opportunities		Wave, tidal, wind (and other) offshore potential	based potential Net exporter of clean enerov
Issues	Climate change happening faster than expected Major Investment required	Major Investment required Consistent support policies needed Over centralised energy system	Grid constraints Investment and leadership required
155005			
HotSW assets	Hinkley C – Nuclear sector de centre and enterprise zones South Coast Marine Cluster Marine research / testing ce AMSR Group); PRIMARE; MAR Offshore development site	eal; supply chain; Hinkley Skills All r entres – Plymouth University (OR RINET; FAB interconnector; Exete s	liance; energy innovation RE, Supergen, COAST, rr University MAG
Requirements	Improvements to electricity More localised energy syste Public investment	y transmission infrastructure (s em	see foundations)
Propositions/ Commitments	Work with Nuclear South W Secure investment in the So Work with the South Coast Secure funding for the May Develop a supply chain proj Supply Chain Develop test and commerce	Vest to implement the Nuclear outh West Nuclear Energy Tec Marine Cluster to take forwar flower Centre for Offshore Re ject to increase capacity in the ialise new energy technologies	Sector Deal in the SW hnology Project d marine renewables newable Energy Energy Systems
Outcomes	Meeting carbon targets More local companies supp industries Growth in higher productiv	lying nuclear, energy infrastru ity jobs and GVA	cture and renewables

7. ENGINEERING FUTURES

MISSION:

The Heart of the South West will double the economic output from its engineering and high value manufacturing sector by 2038 to establish a globally significant engineering capability

To realise the Energy Futures Mission, the Heart of the South West aims to:



The Heart of the South West has an above average concentration of businesses within the Aerospace, Marine, Nuclear and Defence sectors, as well as assets and capabilities that can be exploited to access a number of significant market opportunities such as autonomy, high value design and photonics. These sub-sectors have a geographical footprint, centred on different places for different elements as illustrated below:



Anchor Grow and Attract High Value Manufacturing and Engineering Clusters

Across these sub-sectors is an identified need to *anchor, grow and attract* highly productive clusters, building on local assets and capabilities to maximise economic impact in these places as well as mitigating against the impact of potential loss or longer term decline.

In recent years Government and local partners have made significant investments in place based assets and infrastructure to support these clusters including:

- The Oceansgate Enterprise Zone in Plymouth and associated assets
- Gravity Clean Energy Enterprise Zone near Bridgwater
- Somerset Energy Innovation Centre in Bridgwater
- The IAero Innovation Centre in Yeovil
- The Electronics and Photonics Innovation Centre in Torbay
- The Exeter and East Devon Enterprise Zone in Exeter and associated assets

The Heart of the South West has an ambition to maximise the economic impact of these clusters through the continuation of its place based approach. It will do this by providing the necessary business support, facilities and infrastructure to encourage business growth and investment in these areas, including through inward investment which has a particularly important role in consolidating this approach by filling capability gaps.

The Heart of the South West will:

- Continue to support the growth and development of existing enterprise zones, namely:
 - o Gravity Clean Energy themed Enterprise Zone at Bridgwater serving the clean energy Cluster
 - o The Marine Enterprise Zone at Oceansgate in Plymouth
 - \circ The Exeter and East Devon Enterprise Zone, serving the clean energy and aviation cluster
 - Support the development of further Enterprise Zones or Innovation Zones to serve:
 - Yeovil and the Aerospace cluster in S. Somerset
 - Torbay and the Photonics cluster
- Work with DIT to support inward investment aligned with these clusters and building on existing assets

Achieving Clean Growth through Marine Autonomy and Sustainable Aviation

Marine Autonomy

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The key market opportunity for the marine sector in the Heart of the South West is *marine autonomy*. This disruptive technology has the potential to transform the majority of marine industries and sectors, notably monitoring and mapping, maintenance of offshore infrastructure and shipping [17], making significant contributions to the UK's clean growth and future of mobility challenges. The global market for marine autonomy is expected to be \$136 bn over the next 15 years, with the UK adopting a 10 per cent UK market share [17]. The Heart of the South West has access to a number of assets which it can build on to exploit the marine autonomy opportunity including:

- A concentration of defence primes (e.g. Thales and Babcock) and marine platform manufacturers as well as supply chain companies for sensors, navigation and communication technologies
- 'Smart Sound', a unique marine testing environment (see case study below)
- UK's largest marine institute at Plymouth University and Plymouth Marine Laboratory as well as the Autonomous Marine Systems Research Group, including the UK's first autonomous undergraduate and master's degrees
- Strong photonics sector which is at the heart of developing failure intolerant applications for land, sea and air CAV technologies
- The UK Hydrographic Office providing geospatial data

The Heart of the South West has an ambition to *lead the UK in the development and commercialisation of marine autonomy technologies and be recognised as the national centre for marine autonomy*. Achieving this ambition will:

- Unlock public and private trade and investment with transformative economic potential
 - Contribute to productivity improvements through two main mechanisms
 - the growth of an embryonic niche cluster (marine autonomy)
 - \circ $\,$ the application of marine autonomy technologies to the Heart of the SW's wider marine sector and wider defence sector
 - Contribute to the clean growth and future of mobility grand challenges as well as defence objectives

To achieve this ambition the Heart of the South West will:

- Develop a roadmap with Government to identify the necessary investments in physical, research and business assets to become the national centre for marine autonomy and related technologies
- Secure investment in a 5G in sea test pilot

These commitments align and complement with commitments in the Digital Futures section to develop the Heart of the South West's geospatial market.

Investment in a *5G in sea test pilot* with high bandwidth, low latency and secure connectivity is required by this cluster and would enable the development of sovereign defence capability, significant innovation, and would unlock trade and investment with potentially transformational economic potential. As the benefits are 'non-excludable', the business case for investment would be unviable for any one organisation currently. In addition to the cluster involved with autonomy and smart ports connecting Plymouth Sound would enable the wider marine economy to benefit from the now well documented economic benefits from better digital exploitation.

CASE STUDY: SMART SOUND PLYMOUTH

Launched in 2019, Smart Sound Plymouth is a unique proving area for designing, trailing and developing cutting edge products and services for the marine sector, and is ideally suited for building and supporting the next generation of advanced marine technologies including marine autonomy.

Access to Smart Sound Plymouth is co-ordinated through the Marine Business Technology Centre (MBTC) headquartered at Oceansgate Enterprise Zone and led by Plymouth City Council. Smart Sound provides access to a unique combination of:

- Funded support for eligible businesses
- State-of-the-art offshore and onshore facilities
- 1,000 sq. kilometres of authorised, de-conflicted water space
- World class marine research partners: Plymouth Marine Laboratory, The Marine Biological Association, Plymouth and Exeter Universities.
- The "Future Autonomous at Sea Technologies (FAST) Cluster" enables access to a collaboration of leading industrial partners, specialising in the delivery of innovative marine autonomous solutions. The FAST bring additional assets to the Smart Sound Plymouth



infrastructure and includes leading businesses: Thales, Valeport, Sonardyne, MSubs, Fugro and AutoNaut.

The Smart Sound and related cluster has the potential to put the Heart of the South West at the heart of global marine growth in: 5G at sea and smart connected ports, the UKHO Geovation Hub, and through marine autonomy reducing costs for offshore renewables. The project will also be a "clean exemplar" complimenting the development of the Plymouth Sound National Marine Park.

Sustainable Aviation

The Sector Deal looks to position the UK to take advantage of the global moves toward hybrid electric and electric propulsion as well as to exploit new markets such as drones and Urban Air Mobility vehicles. The Heart of the South West has access to assets and capabilities to support this challenge within both the private and education sectors.

The area is host to key industry players including Leonardo, Honeywell, Thales, Tods Aerospace and BAE Systems. Leonardo has a unique specialisation within Rotorcraft being the only industry prime in the UK with a complete endto end capability as well as innovative projects such as the *Rotary Wing Unmanned Air System* currently being developed for the MOD. Additionally, Exeter hosts the *regional headquarters of Flybe*, Europe's largest regional airline, which includes the maintenance, repair and operational function for the airline, as well as considerable training opportunities through links with local colleges.

Research indicates that integration and collaboration between industry primes and their supply chain and SMEs is vital to successful High Value Design, as new disruptive technologies (such as digital, composites and batteries) sit outside the expertise of industry primes. Therefore the *iAero Innovation Centre in Yeovil* (opening late 2020) will support the commercialisation of technologies within the local SME community by providing high quality light industrial and collaboration space as well as innovation support services. Similarly innovation is supported through the University of Exeter's *Centre of excellence for additive layer manufacturing (CALM),* as well as wider expertise in relation to light-weight materials and alternative fuels and the National composites Centre and other expertise within the University of Bristol in the West of England.

With partners in the wider SW Aerospace cluster, the Heart of the South West has an ambition to make a *significant contribution to the sustainable aviation challenge*.

Achieving this ambition will:

- Contribute to the UK and Heart of the South West's clean growth objectives
- Ensure the Heart of the South West is positioned to capitalise on major new global markets
- Anchor this high value sector in the area

To achieve this ambition, partners will

- Work together with regional partners to develop an overarching strategy to support SW Aerospace
- Work with partners to develop a roadmap to develop the sustainable aviation cluster in Exeter

Improve productivity of engineering through industrial digitisation and supply chain development Seizing the opportunities from Industrial Digitisation

The Made Smarter Review [23] highlighted how digital technologies can unlock productivity from the UK's manufacturing sector through automation and harnessing data. Industrial Digital Technologies are known to improve industrial productivity by more than 25% [24], but the opportunity to apply digital technologies to the area's industrial sectors has not been exploited. To overcome this:

Local partners will secure funding for an Industrial Digital Technology Centre that will bridge the innovation gap between low level TRL and commercialisations focusing on autonomous systems, manufacturing 4.0. machine learning and AI into industry

The Industrial Digital Technology Centre (IDTC) will build on relevant research expertise at the University of Exeter stimulating innovation in the large network of regional industrial partners (across Heart of the South West and Cornwall and Isles of Scilly LEP areas). This clustering of skills and facilities will generate a step change in economic growth and high value jobs by ensuring that companies can access experts and facilities through partnership, maximising their innovation potential and developing staff to build their businesses as the move to Industry 4.0 gathers pace. By responding to needs identified by industry partners, the project will deliver a resurgence in

manufacturing, building on the opportunities afforded by digital innovation and the strength of the science base [24].

Developing supply chain stickiness and cross sector collaboration opportunities

Supply chain development and cross sector collaboration opportunities are also identified as important across all advanced engineering sub-sectors in order to:

- Enable projects to proceed
- Maximise economic contribution from strategic projects
- Support innovation through the cross fertilisation of ideas, materials and technologies
- Develop synergies between sectors and sub-sectors
- Ensure a steady flow of future work
- Enabling projects to proceed (e.g. nuclear)

Local partners have worked hard to stimulate start-ups and supply chain development across individual sectors, included the innovative Hinkley Supply Chain project (see case study below). However, partners have increasingly recognised that the opportunities for growth are from the intersections and cross overs between sectors, especially for sectors such as Defence which cut across the range of engineering sub-sectors and technologies.

Therefore local partners have an ambition to stimulate interconnections between different supply chains to facilitate exchange of ideas, collaboration, skills development and collaboration

CASE STUDY: Hinkley Supply Chain Case Study

The Hinkley Supply Chain Programme launched March 2017 and builds on the previous investments made by EDF Energy and Heart of the South West LEP. The Hinkley Supply Chain Programme is funded through a range of partners including:

- EDF Energy
- Heart of SW LEP
- West of England Combined Authority
- Welsh Government

The contract is delivered by a consortium of SWMAS Ltd, Somerset Chamber of Commerce and Business West with support from EDF Energy.

The programme has achieved the following:

- Engaged with over 90 Tier 1 and tier 2 contractors to the HPC project
- Over 350 work packages identified and assessed
- Companies have been promoted over 7500 times against HPC related opportunities
- Over 3000 companies have been matched against opportunities linked to HPC
- Over 800 companies have started the support journey through the programme
- 120 companies have received intensive support
- Over 100 Workshops have been run to support companies using HPC as a catalyst for growth
- 23 companies have been supported to invest in the region

This has led to over £20 million of contracts won by local firms directly supported through the programme where they have declared the support received was key to helping them win the contract. The Hinkley Supply Chain Programme has also helped companies who are in the bidding process and are bidding for contracts worth over £400 million some of which are at preferred bidder status. The programme is also promoting and supporting local content on a wider basis to aid the £850M spend and £1.3bn worth of contracts that have been placed so far to date.

Summary: Engineering Futures

Outcomes

FUTURES New markets for sustainable aviation Mobility Grand High concentration businesses in					
solutions Aerospace, Marine Global market for Nuclear and Defen marine autonomy sectors	n of e, ce				
Opportunities New markets in photonics, autono sustainable aviatic and high-value destance of the sustainable aviatic aviat	my, n sian				
To be drafted To be drafted Productivity lower national	than				
Supply chains and esector collaboratio	cross n				
Innovation through supply chains	1				

Innovation Centres and Enterprise Zones - Oceansgate EZ; Gravity Clean Energy EZ; Somerset Energy Innovation Centre; Electronics and Photonics Innovation Centre Exeter and East Devon EZ	2;				
Concentration of defence primes - and their supply chains					
'Smart Sound' marine test centre					
UK's largest marine institute at Plymouth University	UK's largest marine institute at Plymouth University				
UK Hydrographic Office	UK Hydrographic Office				
iAero Innovation Centre	iAero Innovation Centre				
Government support for further Enterprise Zones					
Cross-sector supply chain collaboration					
Requirements Private and public investment					
Support growth/development of existing/ new enterprise/innovation zones					
Work with DIT to bring investment alongside local clusters	Work with DIT to bring investment alongside local clusters				
Develop roadmap to become the national centre for marine autonomy					
Secure 5G sea test pilot					
Develop SW Aerospace strategy, and sustainable aviation cluster in Exete					
Develop SW Aerospace strategy, and sustainable aviation cluster in Exeter	Secure funding for Industrial Digital Technology Centre				
Propositions Develop SW Aerospace strategy, and sustainable aviation cluster in Exeter Secure funding for Industrial Digital Technology Centre					
Propositions Develop SW Aerospace strategy, and sustainable aviation cluster in Exeter Secure funding for Industrial Digital Technology Centre High value engineering sector growth leading to higher productivity, innovation and exporting	tion				

8. DIGITAL FUTURES

MISSION:

The Heart of the South West will pioneer Clean Growth through the application of data and AI to become a globally recognised centre of excellence

To realise the Digital Futures Mission, the Heart of the South West aims to:



Exponential growth of the Digital Economy

Commercial, industrial and academic uses of data have expanded exponentially over recent years. According to research from McKinsey, the volume of data continues to double every three years from digital platforms, wireless sensors and mobile phones [25], creating a rich resource for the digital economy. One estimate suggests that open data could help create \$3 trillion of value each year [25].

Unparalleled expertise in the use of data analytics to tackle environmental challenges

The Science and Innovation Audit identified that the South West England and South East Wales has unparalleled, extensive and internationally excellent science capability and assets within sustainability and environmental science [12]. These assets all use data analytics to tackle environmental challenges and risk and protect the resilience of socio-economic systems. The audit identifies that there is a:

"huge opportunity for the area to lead development of new technology and innovation that will be required to live sustainably, underpinned by the need for better integration of digital capacity"

The Heart of the South West is home a number of strategically important assets that are aligned to this opportunity. Of particular significance are the two national capability Government Labs with a focus on environmental and geospatial data including the:

- The Met Office in Exeter (including its Hadley Centre, Informatics Lab and world leading Supercomputer) and
- UK Hydrographic Office in Taunton an executive agency of the MoD, producing nautical publications and services for the Royal Navy and merchant shipping to protect lives at sea

Associated expertise has grown Exeter and Plymouth Universities, with Exeter developing an Institute of Data Science and AI to complement its climate change expertise and has recently become a member of the Alan Turing Institute. Similarly, the University of Plymouth has expertise on Cyber Security and Big Data which complements wider marine expertise in the university and city. Both universities have collaborated on the Environmental Futures and Big Data Impact Lab, which provides bespoke support to business to solve key challenges in the development of new products, services and processes.

The renowned research assets, as well as the area's natural environment and quality of life, attract talented people to work and as a result, there are four times as many environmental scientists in Devon than the rest of the UK and Exeter had a higher number of contributors to the 2014 UN IPCC 5th assessment report than any other area in the world [reference]. Similarly, these assets attract partnership with global organisations such as Amazon Web Services, Microsoft, Google, IBM, World Health Organisation and NASA².

The combination of assets, people and partnership will play a key role in the translation of foundational research into commercially viable solutions, catalysing the development of a multi-billion pound global market for big data, particularly in environmental intelligence market.

The Heart of the South West has an ambition to apply its growing digital and analytical expertise to key economic or societal challenges in the Heart of the South West, where digital approaches have the potential to exert a transformative effect, namely:

- Environmental Intelligence
- Agriculture and Food
- Marine Geospatial
- Healthy Ageing

This will enable the Heart of the South West to act as an exemplar region for Data & AI driven Clean Growth, both in the UK and internationally. It will lead to the creation of better paid jobs, raise productivity, grow inward investment and ensure businesses and people across Heart of the South West are in the vanguard of growing a new economy.

Such a transformation will improve resilience to natural hazards and future-proof against future environmental changes. Continued development of skills and expertise in this area will result in capabilities that are relevant across other sectors as the use of AI & Data intensifies and grows, creating further opportunities for growth amongst other business sectors.

Exploit the area's data and research capability to capitalise on the rapid growth of the environmental intelligence market

What is Environmental Intelligence?

A changing climate, dwindling natural resources and global requirement to transition to a low carbon economy means that businesses and government increasingly need to use environmentally-related information in their operations. Environmental intelligence involves the translation of multiple inter-related sources of Big Data and scientific evidence into 'intelligence' that organisations can use to inform their decision making, such as understanding risks from natural hazards, financial and environmental benefits from green investment schemes, reducing pollution and adhering to regulation.

² The Met Office Informatics Lab, has attracted partnership with global organisations such as NASA, Amazon Web Services and Google

A £100bn global market

The environmental intelligence market is currently fragmented and made up of lots of components, but customers currently include green finance, global corporates, global tech firms and national and international government bodies and the global market for Environmental Intelligence is estimated to be worth £100bn³.

The Heart of the South West has an ambition to exploit these capabilities to capitalise on this rapidly growing market. To achieve this ambition the Heart of the South West will:

- Secure funding for the Environmental Intelligence Accelerator at the Exeter Science Park Global Environmental Futures Campus
- Accelerate the development of Exeter Science Park

The **Environmental Intelligence Accelerator** [26] will exploit the power within the data to optimise environmentallyrelated decision making. By enhanancing capacity to undertake innovation activities, translational research and skills transfer, it will remove barriers to commercial exploitation (including the 'valley of death' in the translation of foundation research to commercially viable Environemtnal Intelligence solution) and ensure the Heart of the South West leads on the development of a global market for Environmental Intelligence Solutions. Plans include

- Headquarters in Exeter (as part of the Global Environmental Futures Campus, alongside the Met Office Supercomputer and Collaboration Hall) including a collaboration space in which public, private and academic sectors can work together to address Environmental Intelligence challenges
- Regional Hubs in Plymouth, Falmouth and Taunton to enable development of a region-wide network that drives both City Led Growth and Rural Productivity Improvement
- A 'Smart South West' Challenge Fund to support private sector entrepreneurs seeking to test environmental sensors and create an open-network of environmental data
- A 'Data & Infrastructure' Challenge Fund to support implementation of technologies to improve access to the data and skills required to develop Environmental Intelligence
- A 'Research Hotel' to enable leading organisations from outside of the region to collocate for short periods with internationally recognised Environmental Science researchers such as Met Office and University of Exeter.

The Accelerator will drive growth in regional markets associated with environmental monitoring and data generation, environmental analytics, software production and environmental consultancy, as well as productivity improvements in a number of vertical sector that are heavily represented in the region including Agritech, Aquaculture and Fisheries, Water and Waste, Infrastrucutre and Construction, Energy Management and Renewables, Tourism and Emergency Response.

Working hand in hand with the proposed Accelerator are proposals to significantly enhance the R&D facilities and innovation capacity at the Exeter Science Park where the headquarters of the Accelerator will be located. The place based proposals [27] are to **Acccelerate the development of Exeter Science Park** in order to create a sustainable, critical mass of innovative and entrepreneurial STEMM (Science, Technology, Engineering, Mathematics and Medicine) businesses by 2027. There is an identified market need for the provision of accommodation to support development of a sustainable and critical mass of innovative and entrepreneurial STEMM and data businesses. By addressing this market failure, the Exeter Science Park proposals will contribute to the continued and sustained growth of Exeter, Greater Exeter, Devon and the wider region whilst recognising the potential barriers to accommodating higher growth rates with the core of the city.

³ Estimating the market size for such as nascent and ill-co-ordinated market is challenging – however, room for growth is substantial. Taking indicative examples, and component parts, a total market of £100n, with growth rates that exceed inflation, would be conservative (Source: Environmental Accelerator, Strength in Places Fund Bid, University of Exeter
Contribute to the Global Challenge of Sustainable Intensification

60% more food will need to be produced by 2050 through Sustainable Intensification

The United Nations Food and Agriculture Organisation (FAO) estimated that if current patterns of food consumption persist, 60% more food will need to be produced globally by 2050, compared with 2005-07. The UK Agri-Tech Strategy [28] highlights the need for agriculture to become more productive and efficient in the UK and the rest of the world, but this needs to be in the context of 'sustainable intensification', which the Royal Society describe as a process 'in which yields are increased without adverse environmental impact and without the cultivation of more land'.

The strategy highlights that achieving this will require multiple approaches, adapting existing farming techniques, developing entirely new production systems as well as innovative engineering and novel approaches to crop and livestock genetic improvement. Underpinning all of these will be *better analysis of data to anticipate new challenges and model potential solutions*.

Since the publication of the national Agri-tech strategy, the Government has invested £60m to establish an Agri-Tech Catalyst to support ideas with the potential to provide significant benefit as well as £90m to establish Centres for Agricultural Innovation, including investment in the Agri-Epi Centre in Somerset (see case study below).

A strong agri-food sector in the Heart of the South West

The Heart of the South West has a strong agri-food sector, built on a rich agricultural and horticultural heritage, which has supported a significant number of artisan food and drink producers as well as internationally recognised names such as Yeo Valley, Riverford Farm and Sheppy's Cider. With a higher than average concentration of farmers, fishers and food producers, the agri-food sector is worth **£xxbn** to the economy and provides **xxx jobs**. [figures to be obtained] It is home to more cattle than any other LEP in England (17%) [29]; and Brixham and Plymouth sit alongside Newlyn in Cornwall as the three key fishing ports in England [29]. The sector is intrinsically linked to the area's natural capital, depending upon it as well as maintaining and enhancing it. However, productivity is below average⁴ and therefore a key challenge for the Heart of the South West is to improve productivity without adverse environmental impact – *sustainable intensification*.

Ground breaking research which fails to percolate down to producers

There are a number of existing knowledge base assets in the Heart of the South West including several land based colleges, state of the art demonstrator farms (e.g. North Wyke and the Agri-Epi Centre) and considerable expertise within the area's universities. For instance, the *North Wyke Farm Platform (Rothamsted Research)* – is a unique national and global research facility that is linked to real-world farming. Supported by UK research and Innovation, the North Wyke Farm Platform is a large scale research facility to study the complete flow of nutrients from soil to food, with the aim of making farming more sustainable. As a founding member of the Global Farm Platform Network, the facility has recently been recognized by the UN Food and Agriculture Organisation as an exemplar facility.

More broadly, these organisations have links to facilities across the wider region such as Duchy Rural Business School and Bath and Bristol Universities as well as the Met Office and Satellite Applications Catapult Centre of Excellence. The area also has a growing portfolio of innovative agri-tech businesses developing technologies and systems to help farmers and producers achieve better yields, reduce their impact on the environment and improve animal welfare.

However, the South West Rural Productivity Commission found that that despite high calibre research institutions in the region, *innovation is not 'percolating' down to producers*, who require independent advice on innovative products and methods as well as direct engagement with researchers [29].

⁴ Both in terms of below the Heart of the SW average of all sectors, as well as below the national average within sector

CASE STUDY – SOUTH WEST DAIRY DEVELOPMENT CENTRE, INTEGRATING ROBOTIC MILKING AND PRECISION GRAZING

The South West Dairy Development Centre, Agri-EPI's dairy farm of the future, is located in Somerset – an important milk producing region, with the SW home to nearly 25% of dairy cows in Great Britain. The farm provides a platform to test and demonstrate new and emerging technologies. Agri-EPI Centre commissioned one of their core industrial partners – independent dairy specialist Kingshay – to design, build and operate a state-of-the-art dairy for research and development, with funding from Innovate UK and industry partners.

A key element of the dairy centre will be to provide state-of-the-art demonstration facilities with visitor access and high-speed connectivity to exploit the benefits of remote access. The dairy is one of the three test beds for the recently announced 5G RuralFirst project which will exploit the massive opportunities for improved connectivity offered to rural business by the next generation of mobile signal.

It is estimated that there are 13 million connected agricultural devices today. This is forecast to rise to 225 million devices in the next ten years. The agri-epi centre provides a test bed for emerging technology and will take UK dairying forward towards an exciting future. For example, one of the first research trials on the new dairy unit will be helping to test an emerging in line system called Milkalyser measuring milk progesterone levels to map the overall ovulation cycle of each cow."

The Heart of the South West will contribute to the sustainable intensification challenge

The Heart of the South West has an ambition to contribute to the global Sustainable Intensification challenge. This will:

- Contribute to clean growth through the development of more sustainable agri-food systems in the area
- Contribute to productivity growth through the development of new agri-tech products and services as well as the application of technology to the agri-food sector in the area.

This will be achieved by development a more cohesive approach to agri-tech research in the South West through the South West Agritech Network. This will ensure speedier translation of research into practice from farm to fork through Agri-tech supply chains in the region, as well as facilitating growth of the area's innovative Agri-Tech businesses.

The Heart of the South West will:

• Support the South West Agri-Tech network

The **South West Agri-Tech** network was established in April 2019 and members include Agri-Tech research organisations from across the whole South West Region. Its initial focus will be the development of a detailed understanding of the Agri-Tech sector capabilities and opportunities, improving collaboration and ensuring dissemination of innovation.

Develop the Heart of the South West's marine geospatial innovation market

Marine Geospatial Data is key to unlocking the value of the Blue Economy

The ability to generate accurate and comprehensive marine geospatial data is the key [17] to *unlocking the value of the blue economy*. The 'big data' revolution is likely to have major consequences for how we use and understand the sea. Significant amounts of scientific (oceanographic and meteorological), spatial (seabed mapping, geological surveying), and shipping (traffic and performance) data is collected in the UK and these volumes are set to increase with the growth of marine autonomy, which will allow the collection of data more efficiently and cheaply in hostile marine environments. The Foresight of the Sea report estimates that the benefits of big data will be significant,

improving enforcement, driving efficiencies in trade and shipping and reducing uncertainty around the impact of emerging industries. However, alongside this global opportunity are increasing threats associated with *marine cyber-attacks*, which can cost companies millions [30].

Marine Data Assets

The UK Hydrographic Office based in Taunton is a leading centre for hydrography, providing marine geospatial data to inform maritime decisions. Working with a range of data suppliers and partners it supports marine navigation, safety, and marine development around the UK and worldwide. Its data solutions are found on over 90% of the world's ships trading internationally. More broadly it provides access to a wide range of marine location based information which enables customers to make better use of the constantly changing marine environment and unlock a deeper understanding of the world's oceans. Its teams use innovative data science techniques and big data technology to handle complex data in new ways.

Alongside the UKHO, the area benefits from marine autonomy expertise (previously described) as well as the University of Plymouth Maritime Cyber Threats Research Group and Centre for Security, Communications and Network Research.

The Heart of the South West has an ambition to utilise these assets to develop a marine geospatial market, ensuring that UK companies can play a prominent role in these internationally important big data opportunities. This will:

- Contribute to the clean growth ambition by developing services which will support the sustainable use of marine resources and mitigation of pollutants
- Contribute to national objectives outlined in Marine 2050
- Contribute to productivity through the growth of highly productive sector

To achieve this ambition local partners will:

- Develop the UK Hydrographic Office Geospatial Innovation Centre and Data Hub
- Develop a new Centre for Maritime Cyber Security, including the creation of a specialised Cyber-SHIP lab

The *Geospatial Innovation Centre and Data Hub* will drive future growth by applying UKHO data science expertise and geospatial information across a range of areas and in the development of new services such as autonomous vessel navigation and work on identification of coastline using satellite imagery to be used for coastal erosion, flood defence and so forth. Developments here will lead to a number of associated benefits to the Heart of the South West and wider economy as follows:

- Large corporates, SMEs and start-ups working in the Blue Economy or navigation space will be able to use the facility to trial new business concepts (investing in R&D);
- The Centre will act as a catalyst in thought leadership to stimulate innovation in the local economy;
- It will create high-value jobs through investment in, and commitment to, nascent sectors including 'Blue' data-science with global opportunity; and,
- It will support up-skilling across the wider economy through STEM/STEAM and outreach activities, working in partnership with local academia. The UKHO is already an exemplar in STEAM, with a high take up by women, and this development would extend this reach.

This proposal is being developed with the Geospatial Commission and is aligned with the Marine Sector Deal.

To respond to the growing marine cyber threats, the University of Plymouth will establish a specialised **maritime cyber lab (Cyber-SHIP Lab)** that will address the risks associated with maritime-cyber. The primary objective of this project is to deliver a functioning maritime-cyber lab to research security in hardware, software, and protection development. Combining maritime technology and cyber-security labs, the Cyber-SHIP Lab will consist of a secure physical space for academic and industry collaboration. The Lab will host a range of connected maritime systems, enabling technology and human usage to be studied and analysed, and system weakness identified. Building on

existing assets at Plymouth University as well as Oceansgate Enterprise Zone, the Cyber Ship Lab will be a unique facility that is already attracting interest from industry including key players such as Lloyds register, Babcock, BT, BP Shipping, Kelvin Hughes, Inmarsat, BMT, Nettitude and AMI Marine UK.

Exploit the combination of big data, research capability and demographics to position the areas as a health technology pioneer

A Global Ageing Population with the Heart of the South West Ahead of the Curve

The National Industrial Strategy describes how the UK population is ageing, as it is across the industrialised world and that by 2046, 1 in 4 people will be 65 years old and over. In 2018, 24% of the Heart of the South West population was 65+ and by 2041 it will be 31%. The Heart of the South West is therefore *significantly ahead of the UK's ageing curve*.

A growing global health technology market

As a result, public health expenditure is expected to rise from 5.9% of GDP in 1990 to an estimated 8.5% of GDP by 2060 [31]. Therefore the global medical technology industry is significant, currently standing at \$430 billion [32]. Within this, the big data analytics in healthcare market was valued at \$16.87 billion in 2017, and is projected to reach \$67.82 billion by 2025 [33] and nationally, the NHS has committed to incorporating new digital health tools, technologies and services as part of its long term strategy.

Exploiting regional assets

The opportunity exists to exploit the region's assets in digital health applications to make the Heart of the South West, alongside Cornwall and Isles of Scilly a key centre for the development and testing of new technology in the field of healthy ageing. With extensive rural and coastal areas the area presents a particular opportunity to test innovation where population density is lower and accessibility is more often difficult so the challenges are different to urban areas [34], as illustrated below.



The Heart of the South West therefore has an ambition to exploit the area's ageing demographic and health research assets to position the area as a health technology pioneer. This will:

- Contribute to the UK Grand Challenge Mission 'to ensure that people can enjoy at least 5 extra healthy, independent years of life by 2035, while narrowing the gap between the experience of the richest and the poorest'
- Support the National Health Service Long Term Plan and Devon and Somerset Sustainability and Transformation Plans
- Contribute to improved productivity, with productivity in the medical, health and life sciences sector above average

Partners in the South West are already pursuing interventions in this area, with projects such as:

- The *Digital Accelerator South West*, which was launched in September 2018 by the South West Academic Science Network to speed up access to the latest digital technologies and ensure thousands of people can benefit from products that can improve their health by working intensively with 5 companies to support innovate and grow
- The ERDF funded *Innovation in Healthy Ageing Project* will drive transformation on how healthcare services are delivered, allowing the NHS and councils who have responsibility for adult social care to change the way they do business by engaging with SMEs (and social enterprises) in the UK Life Sciences sector.

To achieve this ambition, the Heart of the South West will:

- Develop a Healthy Ageing Demonstrator project for creating and testing evidence based, customer-led, products and services
- Develop the Plymouth Health Technology Campus
- Develop Medical Technologies at Exeter (Med-Tex) to position Exeter as a leader for diagnosis, prognosis and treatment of non-communicable disease
- Develop the South West Interdisciplinary Technology Consortium for Health and care (SWITCH)

The *Healthy Ageing Demonstrator Project* will involve streamlining the process of commercialising ideas, as a providing a USP to attract researchers and investors to test solutions in the Heart of the South West. This has the potential to support the development of a new health and care ecosystem covering diagnosis, innovation, prevention and treatment thus responding to societal challenges with a rural focus whilst also increasing productivity, creating new jobs and increasing exports.

Alongside this **further development of the Plymouth Health Innovation Campus** will form a central component of the City's and wider region's health research, innovation and economic activity. This includes the creation of a specialist *University Enterprise Zone facility* to support the translation of research, creating connections between private, public and academic partners which will give significant impetus to the development of the campus, and drive the growth of the health tech sector, with significant local productivity benefits. Similarly, work to position Exeter as a global leader for the diagnosis, prognosis and treatment of non-communicable diseases *(Med-Tex)*, builds on existing EPSRC healthcare technology projects at the university.

The *South West Interdisciplinary Technology Consortium for Health and care (SWITCH)* will likewise be developed as part of the clean growth approach. SWITCH is an interdisciplinary cross-sector consortium, including NHS partners, industry partners, health and social care organisations and patient groups, set-up to enable greater connection and collaboration across the South West region and beyond. Part of the European Connected Health Alliance (ECH Alliance), and linked to the wider Digital Health Ecosystem Network across the globe, the SWITCH ecosystem will seek to incubate, accelerate, embed and export innovative technology solutions in Health and Care. Coalescing around internationally-recognised technologies and data standards this will respond to Health and Social Care challenges within in The Heart of the South West's rural, peripheral and dispersed communities.

Summary: Digital Futures

DIGITAL	Global	National	Local	
FUTURES Opportunities	Exponential rise in data usage - leading to rising demand in data analytics	Al and data economy Grand Challenge Environmental intelligence needed for insurance and investment sectors Government investment in agri-tech innovation	Growing need for environmental and climate science Agri-tech and food sectors Healthy ageing Marine geospatial	
Issues	Climate change happening faster than expected Natural hazards Sustainable intensification of agriculture	Ageing population	Grid constraints Fast digital infrastructure is weak in parts of the area	
The Met Office, in Exeter UK Hydrographic Office, in Taunton				
HotSW assets	Institute of Data Science and AI Environmental Futures and Big Data Impact Lab			
Requirements	Improved digital infrastructure - faster and more widespread (see foundations) Private and public investment			
Propositions / Commitments	Secure funding for Environmental Intelligence Accelerator Accelerate development of Exeter Science Park Support the South West Agri-tech Network Develop the Geospatial Innovation Centre and Data Hub, with UKHO Develop the centre for Maritime Cyber Security, and Cyber-SHIP Lab Develop the Healthy Ageing demonstrator project Develop the Plymouth Health Technology Campus Develop the Medical Technologies at Exeter MED-TEX initiative Develop the South West consortium for health and care (SWITCH)			
Outcomes	An exemplar region for Dat Creation of better paid, hig Inward investment Improve resilience to natur	a and AI driven clean growth h productivity jobs al hazards		

Part 2: Foundations of Productivity: The Drivers and Enablers of Clean and Inclusive Growth

The following chapters in this Local Industrial Strategy set out in detailed commitments across the found foundations of productivity described in the National Industrial Strategy. The table below summarises the actions to support clean and inclusive growth across these foundations.

	Actions to support Clean Growth	Actions to Support Inclusive Growth
IDEAS Driving up R&D and innovation across the region in support of the Government's 2.4% R&D target	Innovation and R&D will capitalise on clean growth opportunities from the area's unique terrestrial and marine environments as well as addressing key challenges facing the area	Innovation and research will be made more accessible by exploring physical and virtual options for increased business engagement and social collaboration
PEOPLE PEOPLE Ensuring a skilled workforce through a Skills Escalator approach, securing the opportunities of the future	Skills and capabilities to support the area's Clean Growth future will be delivered through the Skills Escalator	Opportunities will be created for individuals to access new and better jobs, reducing poverty and promoting diversity
INFRASTRUCTURE The Heart of the South West will future proof its infrastructure to support long term prosperity and clean growth	 Key infrastructure systems will be future proofed for instance: Improving digital connectivity to reduce emissions and allow smart developments Road and rail corridors will be made ready for low carbon and autonomous vehicles The energy grid will be upgraded to support low carbon energy generation Emissions from housing stock will be reduced 	Projects will be developed from commissioning to delivery with inclusive growth objectives and enhanced connectivity will also reduce geographic barriers and facilitate access to opportunities
BUSINESS ENVIRONMENT Making the Heart of the South West one of the best places to start and grow a business	Businesses will be supported to become more resource efficient as well as capitalise on clean market opportunities	Businesses will be motivated and enabled to support inclusive growth, delivering better and higher paid jobs and progression
PLACES Ensuring prosperity for all places through Clean Growth	A 25 year environment plan will be created to protect and enhance the area's natural environment.	Prosperous and inclusive communities will be built at a spatial level, drawing on the principles of social value and maximising the area's natural capital

9. FOUNDATION: IDEAS

MISSION

"Driving up R&D and innovation across the region in support of the Government's 2.4% R&D target"

Innovation is an essential driver of economic progress as it can lead to higher productivity. The Heart of the South West area has a number of unique and internationally significant R&D assets alongside terrestrial and marine environments which provide unparalleled place based R&D opportunities. These will be maximised as the springboard for future development.

	The Heart of the South West's Strategic Objectives			
То	drive R&D and innovation the key strategic			
ob	ojectives will be to:	3.	Foster increased innovation in all businesses to drive growth and productivity	
1.	Further enhance the Heart of the South West's innovation assets and to more effectively connect businesses with the area's knowledge base		The commitments outlined in this chapter will contribute to delivering these objectives.	
2.	Become a test bed for innovation to address societal and environmental challenges in rural, peripheral and dispersed communities			

The Translation of Research

The Heart of the South West area has demonstrable research excellence in a number of key areas linked to the National Industrial Strategy, and Clean Growth in particular. The South West England and South East Wales Science and Innovation Audit [12] and wider LIS evidence base [35] identified:

- Research excellence and facilities within universities related to marine technologies (including offshore renewables), advanced engineering (including composites, autonomous systems and materials characterisation) and the application of AI and data analytics to solving place based challenges, agricultural innovation and healthcare;
- Research organisations including the Met Office, UK Hydrographic Office, and Plymouth Marine Laboratory, providing a unique opportunity to translate environmental data into commercial benefit; and,
- Research intensive businesses in key technology areas such as autonomous systems and in key sectors linked to place such as nuclear, defence and in those where R&D can lead to significant process improvements and cleaner technologies such as aerospace.

Despite these considerable assets, data from the Smart Specialisation Hub shows that the R&D spend within the Heart of the South West's HEIs is somewhat lower than other LEPs areas. However, the area does perform well in absolute and comparative terms on interactions between HEIs and businesses (both SMEs and large companies) [52]. The local research assets identified above have been co-designed with industry, ensuring that they are relevant and impactful but research has identified that much more could be achieved through building on this collaboration, deepening the existing links between SMEs, larger businesses and research organisations for maximum benefit [36].

It is vital that continued investment in research capabilities and facilities is secured. Using the opportunities outlined in this local industrial strategy as a framework, local partners will

Seek to secure investment through Strength in Places funds, Industrial Strategy Challenge Funds and other nationally competitive funds (including those delivered by UKRI) to develop innovation assets and initiatives.

Equally important, however, is the translation of research into market solutions. The Heart of the South West will therefore focus efforts on:

Connecting local businesses with the area's knowledge base in order to increase levels of collaboration and ultimately the local commercialisation of research.

CASE STUDY: CENTEK

Engineers at the University of Exeter worked with Newton Abbot-based Centek Group to significantly reduce costs and development times for new products into the oil and gas sector. Centralizers are vitally important for safety in the oil and gas industry, retaining casings centrally within boreholes and preventing leaks at the surface. Centralizers are often in demand at very short notice, with specific requirements depending on the drilling operation. Existing methods for development of centralizers for demanding oil wells can take up to 12 weeks, and can cost several thousand pounds. Costs for delaying drilling operations are extremely large, and so short development time is especially valuable. Current design and test processes require several concurrent prototypes. Using some of their high performance computers, engineering staff at the University of Exeter have developed specialist modelling software and a surface response modelling tool which will drastically reduce the number of test cycles, and the total cost and time taken to get new products to customers. By working with the University of Exeter, Centek have demonstrated they can produce new product designs within one week and cut costs by up to 80 per cent. This new design tool, which can run on a smart phone on site at an oil well, will not only increase profitability for the Devon-based manufacturer, but also safeguard quality jobs and help Centek Group beat international competition.

Using the Unique Terrestrial and Marine Environment as a Test-bed for Innovation

Underpinning the area's assets is the unique terrestrial and marine environment which provides unparalleled place based R&D opportunities, but also a number of place based challenges in themselves requiring innovative solutions. With extensive rural and coastal areas the Heart of the South West presents a particular opportunity to test innovation where population density is lower and accessibility is more often difficult so the challenges are different to urban areas. Likewise, the coastline, moors, uplands and fertile farmland which underpin the area's agriculture (and other sectors) are exposed to environmental challenges. Organisations such as PwC, World Economic Forum and Microsoft have highlighted that there is both urgent need and significant opportunity associated with the application of AI and Data technologies to sectors that are impacted by environmental factors [37]. The development of innovative and technological solutions to these challenges can provide a living laboratory for the development of solutions.

The Heart of the South West has an objective to become a test bed for innovation to address societal and environmental challenges in rural, peripheral and dispersed communities. Building on recommendations from the South West Rural Productivity Commission [51] the Heart of the South West will:

Create a 'Smart Rural Research Platform' to address societal and environmental challenges in rural, peripheral and dispersed communities, addressing challenges around transport, ageing population, energy and natural capital.

The platform will bring together a range of public and private sector organisations and academic partners to focus on specific place based challenges around transport, ageing population, energy and agriculture and natural capital to create a critical mass of scientists, entrepreneurs and investment that in turn becomes a virtuous circle, attracting skills and further investment. Modelled on the Brainport Initiative in Holland, this will initially take the form of an overarching promotional concept under which other test-bed projects will sit, helping to promote the area to potential inward investors, researchers and entrepreneurs. Further, by bringing together the various 'test-bed' projects under one umbrella, connections will be made between projects and greater value added.



Driving Innovation Across the Business Base

Evidence from the Smart Specialisation Hub shows that the number of active graduate start-ups is significantly below average, as is business spending on R&D [52]. This picture is accentuated by poor performance in securing government funding for innovation: the Heart of the South West receives only 9% of the South West's share of Innovate UK funding despite being home to over 30% of its population [36]. The evidence also shows that where Innovate UK funding is secured across the far South West (i.e. the Heart of the South West and CloS) it tends to be for smaller projects. The analysis shows that had firms in the two LEPs successfully bid for Innovate UK competitions at the same rate and project value as other areas, over £100m more innovation funding would have been secured between 2014 and 2017.

Innovate UK has pledged to work collaboratively with the two LEPs to drive up take-up of Innovate UK support in the area. Having developed an evidence based understanding of the barriers for local businesses in accessing Innovate UK funding, on-going work developed through the Memorandum of Understanding will help provide the solutions required to harness the potential of the region.

In order to foster increased innovation in all businesses to drive growth and productivity, the Heart of the South West's key commitments will therefore be to:

- Work with Innovate UK through the existing Memorandum of Understanding to develop solutions to encourage take up of Innovate UK funding.
- Build on the area's innovation assets and existing good practice as part of the process.

The area's physical innovation assets including Science Parks, Innovation Centres and Enterprise Hubs will also be a key part of the process, acting as key 'anchors' for the commercialisation of research as well as the retention of graduates and young talent. These will co-develop and deliver bespoke innovation and acceleration programmes for businesses in the three priority technology areas, and through the Growth Hub, widen this to all businesses.

Building on previous experience and evidence gathered as part of the Heart of the South West Rural Growth Network project, partners will also develop an innovation toolkit specifically for use by micro-businesses. This concept has been successfully shown to improve productivity, help businesses grow, identify new markets and stimulate innovation.

SUMMARY OF COMMITMENTS - IDEAS

The Heart of the South West partners will:

- Seek to secure investment to develop innovation assets and initiatives
- Connect local businesses with the area's knowledge base in order to increase levels of collaboration and ultimately the local commercialisation of research
- Create a 'Smart Rural Research Platform' to address societal and environmental challenges in rural, peripheral and dispersed communities
- Work with Innovate UK to develop solutions to encourage take up of Innovate UK funding, building on the area's innovation assets and existing good practice as part of the process

Government will

• TBC – possibly something about the MOU

10. FOUNDATION: PEOPLE

MISSION

"Ensuring a skilled workforce through the Heart of the South West's Skills Escalator approach, securing the opportunities of the future"

Through the leadership of the Skills Advisory Panel, local partners and Government will work together to ensure there is a skilled workforce for the opportunities of the future with a clear and active pipeline of talent for all to reach their potential. The Skills Escalator will support creating aspirations and career pathways for young people, up-skilling residents, actively retaining and attracting graduate talent, and supporting those furthest from work access appropriate and good jobs and progress in employment.

The Heart of the South West's Strategic Objectives	
To help realise the strategic aspirations set out in this Local industrial Strategy, Heart of the South West partners will:	 Improve retention and recruitment of those with technical and higher-level skills through clearer line of sight to local opportunities
 Support institutions to increase the take up of Science, Engineering and Maths (STEM) courses amongst young people and adults 	 Increase employer investment in workforce development, including digital skills, leadership and management, through strengthened advice and support services
 Ensure all residents have the functional and employability skills (including literacy, numeracy and digital literacy) they need to progress into and within the workplace 	 Work with institutions to ensure that the Heart of the South West's learning facilities and teaching capacity are fit for purpose and meeting future need.
 Increase the take-up of those technical qualifications (including T-Levels and apprenticeships) needed to drive the Heart of 	The commitments outlined in this chapter will

Summary – The Current Position

the South West's Local Industrial Strategy

In a modern, innovative and creative economy, people are an area's most significant asset. The Heart of the South West is home to 1.7m people, equivalent to Birmingham and Nottingham combined. However, the population is ageing at a faster rate than the UK and by 2030, 28% of the population will be over the age of 65. Whilst the area has made good progress in reducing unemployment, the high employment rate means there is now an extremely tight labour market and employers are struggling to find the skilled labour they need. Despite this employment growth, lack of productivity growth means that wages have flat-lined and in work poverty is a rising issue.

contribute to delivering these objectives.

Demand for highly skilled individuals is increasing, particularly from employers within the energy, engineering and digital sectors who require people with Science, Engineering, Technology and Maths (STEM) skills. In addition to significant technical skills there is also a demand for core employability skills from employers. Children in the area benefit from a good education in primary and secondary schools, with performance in line with national averages. However, fewer young people continue to study at a higher level and while the area benefits from xxxx [figure to be sourced] students, graduate retention is lower than average. As a result of this and migration trends, the area has a lower proportion of people with higher level skills. Whilst good progress has been made to increase higher level skills, this has not been fast enough, and the Heart of the South West is falling behind the national average.

An Ageing Workforce

Population and workforce data shows that the Heart of the South West area has a higher than average number of individuals in its workforce over the age of 55 [38] and feedback from employers indicates that the Clean Energy, High-Tech Engineering and Digital sectors are particularly vulnerable to the loss of ageing talent. The impact of the ageing

population will continue to be felt on the labour market in coming decades as by 2030, 28% of the Heart of the South West Population will be over the age of 65, compared to 22% in England and by 2040, it will have risen to 31%.

A tight labour market with challenges around deprivation and aspiration

With an employment rate of 78.7% compared with 75% nationally, the Heart of the South West has a tight labour market with almost functional full employment in many areas [39]. However, there is a high degree of variation across the area in terms of full and part time employment, wage levels and impacts of seasonality. Average wage levels fluctuate by around £120 / 22% per week by workplace. Similarly, whilst unemployment rates are low overall, levels vary by around 4-5% with some of the area's more deprived wards [39], within the top 20% nationally sitting adjacent to those within the bottom (notably within Plymouth and Exeter).

In practice, this variability is often indicative of underlying structural challenges across and between the Heart of the South West's communities. Whilst employment performance overall is strong, individuals and communities continue to under contribute due to a range of cultural, aspirational or practical barriers / issues. Given the tightness of the labour market however, this on-going underperformance is increasingly critical in terms of raising productivity and addressing social cohesion.

Partners in the Heart of the South West working with Government have led on a number of initiatives to support unemployed individuals as well as those looking to progress in the labour market. This includes an innovative Wage Progression Pilot supported by DWP through the Plymouth and Peninsula City Deal and the West Somerset Opportunity Area.

CASE STUDY – WEST SOMERSET OPPORTUNITY AREA

In the former West Somerset, the Department for Education-funded Opportunity Area Programme has delivered additional investment in initiatives and infrastructure to boost skills for employment and business. For individuals, this has included: an extension to the Access to Employment and Learning grant, supporting individuals to overcome some of the barriers that prevent them from taking up employment and learning; a range of new learning opportunities for adults and young people, delivered locally, via the New Routes into Work Programme, Children's University and Studio Digital project; and a new website, 'Study-Up', which provides an overview of Somerset's Higher Education offer and a Western Somerset Careers Fair. For business, the fund has enabled the creation of a new Small Business Network to support the engagement of SMEs in careers and skills development activities; additional workshops to encourage take-up of digital technologies that supports business productivity.

Perhaps the most significant investment has been the creation of Skill-Up West Somerset, a free and impartial Apprenticeship and Skills Advisory Service for individuals and businesses in the former West Somerset. Work continues on developing Skill-Up 'Here', the element of the project that seeks to establish a network of training locations, ensuring that a wider range of training provision can be delivered into the area, both face to face and virtually, as well as being accessible to the remoter parts of the former West Somerset.

STEM skills needed for the Future Economy

Evidence shows that the Clean Energy, High-Tech Engineering and Digital sectors employ in the region of 60,000 individuals, or around 7% of the area's total workforce; and they employ the area's more skilled personnel. Demand for roles within the priority sectors has risen year on year [40], reflecting in part the challenge of the ageing workforce as well as sector growth. Whilst the Heart of the South West benefits from a steady supply of individuals coming out of education into technical and STEM roles (roughly 6,000 new entrants per annum into relevant careers), it is estimated that a further 40,000 trained individuals will be needed over the next decade if the priority sectors are to fully achieve their ambitions [41].

The need for people with Science, Engineering and Maths skills is therefore clear and has been a focus of the LEP's skills capital investments in recent years as well as joint initiatives with Government such as the *National Nuclear College* and the recently agreed *Institute of Technology*. Alongside this, the Heart of the South West, with the support of DCMS is the 2nd LEP area in the country to set up a *Digital Skills Partnership* to improve digital capabilities across the

whole skills spectrum. Maintaining this momentum will be essential to delivering a step change in the availability of STEM skills in the Heart of the South West Economy.

Higher level skills need to improve

The education of young people in the Heart of the South West is relatively good. GCSE attainment is slightly above the national average for most of the area, providing a strong platform on which to build. [42] However, approximately 60% of those taking Maths GCSE at KS4, still do not get a grade 5 or above on their first attempt [43], with not enough young people then able to progress to STEM pathways or apprenticeships without additional intervention. In addition, educational attainment then further slips by age 18, with the A-Level achievement rates falling below the national average [44], affecting the pipeline of future talent, with 10% fewer young people from the area going on to study at a higher education institution. Whilst the area's universities attract students from around the world, the Heart of the South West also struggles to retain graduates, with an overall graduate retention rate of 38.2%, more than 10% lower than the average HEI nationally [45].

As result of these issues, the Heart of the South West has a lower proportion of people with an NVQ Level 4 or above (35.9% compared with 39.3% nationally) [39] although this varies significantly geographically⁵. Despite good progress in raising the skills of the population in recent years, this progress has not been fast enough and higher-level skills within the Heart of the South West have not kept pace with national improvements, as illustrated below. If the Heart of the South West is to meet the productivity challenge however, further action will be needed to reinforce both progression and delivery.



Figure 4: Proportion of 16-64 year olds with NVQ Level 4 plus qualifications [39]

A strong provider base which needs investment for future provision

Despite weaknesses around progression rates, the Heart of the South West area benefits from a high quality Further and Higher Education sector with a number of gold standard colleges and universities. The area also benefits from a significant number of high-quality private training providers and adult community learning services, offering a range of tailored and hard to secure provision to businesses and residents, as well as an array of secondary level technical academies and specialist schools. However, the offer across the college, university and provider stock is often influenced by the quality and age of assets and capacity involved. Whilst overall provision for the Clean Energy, High-Tech Engineering and Digital Sectors is strong, with achievement in related subjects making up roughly 20% of all certifications above Level 3 [46], performance against wider competencies can be more mixed.

⁵ For example, there is a 32% difference between the highest and lowest performing districts in terms of the proportion of the population with Level 4 qualifications (18% in the former West Somerset, 50% in West Devon) [39].

As such, the Heart of the South West is currently engaged in a range of activity to broaden its qualification and technical offer. Two thirds of the area's FE institutions are currently piloting T Levels, whilst the recently confirmed Institute of Technology (IoT) will help to deliver higher level technical education and training to address skills gaps, meet employer needs and drive productivity.

CASE STUDY: SOUTH WEST INSTITUTE OF TECHOLOGY

The *Institute of Technology* is a collaborative venture covering the Heart of the South West and the Cornwall and Isles of Scilly LEP areas, as well as parts of the West of England area. The partnership includes the following anchor education institutions: Universities of Exeter and Plymouth, Exeter College, Petroc, Bridgwater and Taunton College, City College Plymouth, Truro College and Penwith College, supported by Oxygen House, Babcock, Met Office and TDK as anchor employers. The mission of the South West Institute of Technology is to:

- Provide employers with the skills that they need to succeed, now and in the future
- Provide learners with excellent technical education
- Enable the South West to become one of the world's leading regions for digital, engineering and manufacturing technologies

CASE STUDY: EXETER MATHS SCHOOL

Exeter Mathematics School (EMS) is an Ofsted Outstanding, state-funded 6th form specially designed for young people who love maths, physics and computing. Jointly sponsored by the University of Exeter and Exeter College, it opened in September 2014 with a pioneering formula which is all about freeing students up to explore the subjects they love inside out. EMS gives students the freedom and challenge to go further than the standard exam-led A level curriculum by exploring the incredible creativity and excitement of maths, physics and computing and every student gets to take the Exeter Maths Certificate. As a real highlight of the course the Exeter Maths Certificate provides students with an opportunity to engage with demanding, real-life mathematics challenges set by one of the school's partners in academia or industry and to carry out independent, in-depth research. The majority of EMS students progress onto STEM subjects at top universities and the curriculum is designed with this in mind, providing them with the preparation they need for the challenging, independent enquiry-led culture to be experienced as an undergraduate.

Workforce Development and Business Engagement

Evidence suggests that strong business engagement and leadership is critical to drive forward workforce productivity and skills achievement. Areas where the business community prioritise and invest in training and build workforce capacity are often the most productive regions. The Heart of the South West benefits from positive engagement from the business community on the skills agenda, with 78% of business offering some form of training in 2017 compared with 66% nationallyⁱ, with 91% of those business responding providing job specific or digital training offer in year.

However, survey data shows significant differences between large and small business within the area, with large businesses reporting almost universally some formal approach to workforce development, whilst smaller business reported less consistency (with only 30% of micro businesses reporting any training plan or approach in year). Data around specific initiatives and approaches shows differences in knowledge and capacity, with only 30-35% of smaller business aware, for example, of apprenticeship provision and the levy compared to 61% overall. Lack of knowledge and awareness of the benefits of investing in workforce development within the micro and small business sector is a constraint on raising productivity and improving prosperity.

KEY COMMITMENT – The Heart of the South West Skills Escalator

The Heart of the South West recognises it requires a multilateral and multifaceted approach to skills and people development to overcome the challenges set out above. In response to this the area is taking forward a Skills Escalator, building on a strong skills and employment foundation, to meet future demand and provide a clear pipeline of talent for our future economy. The Skills Escalator, through a series of interventions, seeks to accelerate and focus efforts to increase the availability of higher level and technically trained individuals to grow our opportunity sectors, and support every individual play an active part in the future prosperity of the area. It will:

- Mobilise, inspire and empower young people to train and learn through academic, apprenticeships, T levels and other routes into opportunity sector roles;
- Engage and support those outside the labour market access relevant opportunities within the Heart of the South West growth sectors, and develop the basic and intermediate skills they need to progress;
- Enable those already in work to up-skill and access new opportunities through both in work training, apprenticeships and other vocational opportunities including wider career jumping approaches between sectors;
- Maximise and retain the talent of older people and those seeking to leave the labour market in key roles, including teaching to support a pipeline of talent for all sectors; and,
- Interact and support the business community to optimise their existing workforce and better prepare and contribute to creating the workforce of the future.



The Skills Escalator model illustrated above builds on a range of current activity being delivered locally and jointly with Government, including:

- Careers, Information, Advice and Guidance in schools and colleges supported by the Careers Hub
- Bespoke and tailored technical skills and training supported by the *Institutes of Technology* and their respective Observatories and Boards
- Expert led and shaped digital support via the Digital Skills Partnership
- Enhanced outreach and adult retraining capacity working with DWP, DfE and wider agencies to maximise impact including *a Career Learning Pilot*
- Information advice and guidance service utilising and directing apprenticeship levy, related *apprenticeship and traineeship service* and reinforcing delivery to SMEs and other business partners;

Achievement of the Skills Escalator approach requires alignment of both Government and local partner resources to address specific pinch points and gaps in the labour market and improve the impact through a joint set of commitments as highlighted below.

Key Local Commitments: Work with Government to implement a best in class skills escalator to provide a clear pipeline of talent and a joined up series of interventions to allow every individual to play an active part in the future prosperity of the area

To achieve this commitment, Heart of the South West and local partners will:

- Align existing and future activity and resources around Careers Advice and Guidance, Apprenticeships and T Level take up, and Technical Skills provision, all contributing to the Heart of the South West's Skills Escalator
- Establish an Inclusive Growth Task Force, to take forward additional and effective upskilling opportunities to support all residents, including those with a disability, reach their potential and contribute to the future prosperity of the area
- Develop the area's existing adult retraining provision and resources, bringing together local capacity and delivery through the Skills Advisory Panel to meet the identified needs of the Heart of the South West's businesses
- Build on the Heart of the South West Growth Hub offer by integrating skills advice and business support services through a single business advisory approach supporting businesses to develop a skilled and flexible workforce now and, in the future

To achieve this commitment, local partners will work with Government to:

- Strengthen Careers, information, Advice and Guidance provision for young people and adults by aligning national programmes with local activity, exploring opportunities to extend the Careers Hub and work with primary schools and utilise and direct apprenticeship levy and related apprenticeship and traineeship services
- Jointly plan current and future adult education resources to ensure a consistent, relevant and effective offer is available within the area, including around the emerging National Retraining Programme
- Facilitate the delivery of additional and complementary technical skills provision within the Heart of the South West, including taking forward the South West Institute of Technology, agreeing a shared strategy and prioritisation of future investments into the Further Education / Higher Education Sector and exploring opportunities to significantly extend the reach of the Digital Skills Partnership.
- Engage with the Heart of the South West's Inclusive Growth Task Force to take forward specific activity around those still outside the labour market, building on Government's existing national programmes around disability, inclusive employment and returners.

11. FOUNDATION: INFRASTRUCTURE

MISSION

"The Heart of the South West will future proof its infrastructure to support long term prosperity and clean growth"

To seize the opportunities outlined in this Local Industrial Strategy and prepare for the future, the infrastructure in the Heart of the South West needs to be future proofed, addressing the challenges of today as well as tomorrow.

Objectives are to:

The Heart of the South	h We	est's Strategic Objectives
To support long term prosperity and clean growth, Heart of the South West partners will:	4.	Future proof <i>housing delivery</i> to meet housing numbers required for growth, as well as minimise carbon emissions
 Future proof the Heart of the South West's <i>energy system</i> to create an energy future that is low carbon and more affordable, maximising benefits in the region Future proof the Heart of the South West's <i>transport systems</i> to create fast, resilient and clean networks Future proof the <i>digital infrastructure</i> 	5.	Ensure sufficient <i>employment land</i> for growth
across the whole area, enabling urban and rural areas to compete with the fastest UK core cities		

Future Proofing the Heart of the South West's Energy System

Energy Systems – A rapidly changing future

As described in the energy futures chapter, the energy system is expected to undergo significant changes over the next 30 years in order to meet carbon targets, with much more integration between component parts of the system (e.g. electricity and transport, gas and electricity etc.). Scenario modelling undertaken as part of the SW Energy Strategy [20] highlighted how the future energy system is likely to feature a much stronger role for electricity in the future, with electricity generation doubling by 2030 and doubling again by 2050. As a result, the area has the opportunity *to flip from being a net importer of electricity to be a net exporter by 2030*. Alongside this growth in generation, demand for electricity also increases with a stronger role for electrical heating through heat pumps and a rapid increase in electric vehicles. However, responding to his future will *require existing capacity issues on the distribution network to be addressed to allow for the expansion of transmission capacity*. The gas distribution network is also likely to change depending on the scenario; redundant by 2050 in fully electrified future; or converted to carry hydrogen in a hydrogen future.

The Heart of the South West has some of the highest installed renewable energy capacity in the UK and benefits from significant renewable resources including solar, wind, geothermal, marine and biomass. Innovation in these technologies, as well as energy storage methods and the integration of energy systems mean the Heart of the South West is well placed to transition to a clean energy system.

Barriers to the transition

The energy strategy highlighted several barriers for the transition to a low carbon energy system, including insufficient returns, capital intensity, fragmentation, lack of information, resistance to change and policy, regulation and planning. However, a key infrastructure barrier is the *electricity distribution network*. The current centralised system was not designed for distributed generation in homes and communities and increasing levels of distributed

generation has resulted in the grid becoming congested, constraining the further roll-out of renewables. Whilst there has been significant investment to upgrade the transmission grid for Hinkley Point C, with an estimated cost of £800m, there are alternative models. The energy strategy makes the case that constraints can be alleviated without significant investment if energy is managed and used smartly through *active network management, demand side response, flexible connections, energy storage and virtual networks*.

The area is already pursuing innovative projects in this field. For example: The Local Energy Market in Devon and Exeter (LEMDEx) project, which is funded by the BEIS Prospering from the Energy Revolution Programme, will be testing new regulatory, commercial and business models and smart energy trading technology in order to make it easier to design a system that would allow Local Energy Markets to be piloted in Exeter and Devon in 2020.

The Heart of the South West has an ambition to create an energy future that is low carbon and more affordable, whilst maximising the benefits in the region. Achieving this will mean:

- The area is self-sufficient in clean electricity production, and able to meet future needs
- The energy distribution system is smart, integrated and flexible
- Electricity infrastructure issues have been resolved and the grid is able to accommodate future growth of renewables
- Energy is affordable and fewer people will live in fuel poverty

To achieve this, the Heart of the South West will:

- Set-up a Local Energy Group to take a systems perspective on local energy
- Support the South West Energy Hub
- Support the development of innovative energy projects including: integrated systems, energy storage, renewable electricity (including community renewables), renewable and heat networks, energy storage etc.

The **Local Energy Group** will leverage the LEP's convening power to unlock the local distribution grid, providing a forum to join up thinking across distributed-level technologies. Key stakeholders will include the National Grid, national transmission system, Big 6 energy companies, Ofgem, community groups and interest companies, BEIS, Distribution Network Operators, Gas Distribution Network Operators, local developers and supply chain representatives.

The **South West Energy Hub** has been funded by BEIS to work with LEPs and Local Authorities across the region. The Hub will have a small team of energy project managers, with access to technical, legal and financial expertise, who will provide practice support and expertise to the LEPs and Local Authorities to help them undertake the initial stages of development for priority energy projects, up to the point where they are able to secure finance.

More broadly the LEP will support the **development of innovative energy projects** that provide opportunities to develop innovative solutions to some of the Heart of the South West's energy challenges. This will include the development of a **revolving loan fund** or **Green Deal** for energy projects where there is market failure.

Future proofing the Heart of the South West's transport systems

The need for fast and resilient networks

The area's transport systems need to be fit for the future, providing fast services that are reliable and sustainable. The UK is on the cusp of a transport revolution, with the future of mobility expecting to see a progression from traditional transport models through intermediate technologies (e.g. electric cars) through to autonomous vehicles and transport as a service. When combined with future social changes in terms of the 'future of work', there are significant implications for the transport systems of the future.

As well as responding to transport needs of the future, the Heart of the South West's transport systems need to be effective and resilient today. There is a body of evidence [47], [48], [49] that shows that distance from markets and journey times have a negative impact on the overall performance of the economy in the South West.

Research from the Peninsula Rail Task Force found that the disruption caused by flooding at Dawlish and the Somerset Levels in 2015 cost the area £1.2bn [50] and Network Rail warned that unless action is taken to improve the resilience of the railway in the South West, events similar to those in 2014 will increase by over 600% to 1 in every 4 years by 2065 as a result of climate change [50]. Improving the resilience of the rail network in the South West is therefore vitally important.

The need to reduce emissions from transport

In 2016 transport accounted for 43% of carbon emissions from the Heart of the South West [51] and unlike other 'sectors', transport emissions have only fallen by 3% between 2005 and 2016 (see graph below)



The South West Energy Strategy pointed to several key opportunities to reduce emissions from transport. These included 1) increasing the use of *ultra-low emission vehicles* (e.g. biogas and hydrogen and increasing the deployment of **electric vehicles and associated charging infrastructure.**

The Heart of the South West has an ambition to create a fast, resilient and clean transport system. This will:

- Improve productivity
- Contribute to the achievement of carbon targets
- Improve the health of the population by improving air quality

To achieve this, local partners will:

- Continue to support the Peninsula Sub-National Transport Body
- Develop strategic plans to significantly reduce carbon emissions from transport including through the development of the EV charging network, ultra-low emission vehicles and sustainable transport strategies

The *Peninsula Sub-National Transport Body* (currently in shadow form) will enable more effective engagement between the partner authorities and the Department of Transport about the challenges linked to the growth ambitions and associated strategic investment needs of the area. This puts in place a clear mechanism for Government to engage with the South West Peninsula authorities on strategic transport investment matters on a wider geographical basis, complementing the work of transport authorities in the wider South West.

Future proofing the digital infrastructure across the whole area

Evidence from Ofcom [52] shows just 89% of premises in the Heart of the South West can access superfast broadband infrastructure compared with 95% across the rest of the UK. Similarly, only 29% of properties can access ultrafast broadband compared to 54% across the rest of the UK. Performance on other indicators, including full-fibre, the number of properties eligible for the universal service obligation and mobile infrastructure is equally poor.

Data from Connecting Devon and Somerset indicates that on completion of the current roll-out plans, approx. 55,000 premises will not be connected to superfast broadband (measured at 30 Mbps download speed). These are expected to span the entire region, in a highly fragmented pattern, with small pockets (and in some cases just isolated dwellings) dispersed throughout the region. At the same time, policy has moved away from superfast to achieving nation-wide fibre coverage by 2033, offering symmetrical upload and download speeds of a Gigabit and

more. Making sure the Heart of the South West is at the forefront of driving this national ambition to support the identified future sectoral opportunities and all businesses is a fundamental requirement of this strategy.

The Heart of the South West has an ambition to deliver 100% superfast broadband coverage across the area by 20xx [date to be added] and make a significant increase in full fibre connectivity building to area-wide coverage by 2033. Fast (including ultrafast) and reliable digital connectivity will:

- Drive productivity improvements allowing businesses from across the area to access digital solutions to improve productivity within their business and reducing the peripherality effect
- Address grand challenges enabling smart solutions to grand challenges of healthy ageing, future of mobility and clean growth and reducing the impact of travel
- Enable transformation of our economy enabling development of our digital cluster and associated cross sectoral opportunities
- Address the challenges of place enabling businesses to start-up and grow anywhere in the region, reducing gaps between best and worst performing parts of the Heart of the SW
- Address inclusion enabling people to access skills and employment opportunities wherever they live

To deliver this ambition local partners will:

Develop the Heart of the South West Digital Strategy, including blended set of approaches and strategies to reduce the digital divide and ensure all areas can benefit

Working in partnership, Government will:

- Pilot with the Heart of the South West the emerging 'outside-in' strategy to support nation-wide fibre coverage by 2033 recognising the challenges of achieving this within rural locations
- Pilot with the Heart of the South West approaches to provide fibre connection hubs building on the Rural Connectivity Programme and Local Full Fibre Network pilots and testing alternative approaches to the Universal Service Obligation.
- Pilot 5G solutions across urban and rural areas, supporting specific business clusters

Future proofing housing delivery

Accelerating Housing Delivery to Support Growth

Housing is of fundamental importance to achieving local economic growth priorities as well as delivering clean and inclusive growth. Insufficient homes constrain employment growth. In the Heart of the South West, house price to income ratios are higher than the national average and so are the costs associated with renting.

There is a clear desire to see quality housing growth delivered across the Joint Committee area and as such, a Housing Task Force was established. Research commissioned by this task force [53] found that all areas have confirmed a positive, pro-growth ambition with increasingly stronger integration between planning and economic development teams. The total number of houses planned in the Heart of the South West local plans (including joint plans) which expire at various times between 2030 and 2040 is 146,980. This equates to delivery rates of around 8000 houses per year. However, delivery across the area is currently around 91% of annualised targets (although there are notable exceptions). The research highlighted a number of barriers to delivery including capacity for delivery, policies for delivery and infrastructure to support housing delivery.

In terms of future proofing housing delivery, the ageing demographic means that there will be an increasing need to plan for the needs of an ageing population.

Opportunities through Garden Towns and Villages

The area is able to benefit from other initiatives in relation to housing including Garden Towns and Villages, with Taunton designated as a Garden Town and Culm in Devon designated as a Garden village.

CASE STUDY: TAUNTON GARDEN TOWN

Taunton was designated as a 'Garden Town' in early 2017 following a submission to Government. This submission reflected the Council's commitment to transformational housing growth centred around a number of new garden communities and a regenerated town centre supported by essential infrastructure and an enhanced network of green infrastructure. Its emerging vision for Taunton to be a *'flourishing, distinctive and healthy town where we all enjoy an exceptional quality of life and are proud to live'*. Making this happen will include measures to celebrate the town's roots, making the town greener, integrating the transport network to enable cleaner, smarter moving, as well as developing a dynamic, prosperous business community.

Reducing carbon emissions from domestic sources

From a clean growth perspective, whilst domestic carbon emissions have fallen by 35% since 2005, the sector still accounts for 28.5% of all carbon emissions in the Heart of the South West area [51]. The South West Energy Strategy highlighted that the region has one of the highest proportions of hard to treat homes in the UK at 44% and fuel poverty is also high, attributed to the fact that 19% of homes are off the gas grid, 21% have solid walls and 1.4m homes are considered thermally poor [20]. Retro-fitting the buildings and reducing demand for energy through more efficient appliances etc. will be important to reduce carbon emissions in the domestic sector, as well as using the drive for new build developments to provide opportunities to test and deploy low carbon solutions and designs (e.g. Passivhaus and district heating).

The Heart of the South West has an ambition to accelerate housing delivery in the area to deliver at least 150,000 new homes over the next 15 years to support growth in the area, as well as minimise carbon emissions from domestic sources. This will:

- Increase the supply of homes, ensuring housing does not act as a break on growth
- Reduce the carbon emissions associated with new and existing homes
- Contribute to Government policy to increase the number of available homes, as well as providing housing to support holder and vulnerable people and clean growth.

To achieve this, the Heart of the South West Housing Task Force will:

• Develop a strategic approach that reflects and incorporates the different needs and delivery models required across the whole area to create and deliver ambitious plans to get more homes built in an accelerated timeframe, whilst also minimising carbon emissions. This will include unlocking land and investment, detailed modelling of infrastructure requirements to unlock growth and housing action plans for strategic sites across the region.

Working in partnership, Government will:

• Work with the Heart of the South West Housing Task Force to a) assist with the skills and resources to provide a stronger and more consistent approach to viability appraisals; b) Develop pioneering low carbon new home developments across the area as well as improving energy performance of existing housing stock (including hard to treat homes); c) Develop innovative funding models for infrastructure to unlock housing and boost liquidity in the small-medium site sector

Developing sustainable financial solutions for infrastructure

The Housing Summit found that critical infrastructure to unlock housing was considered to be a major challenge. Developments are often hampered by inadequate transport and other infrastructure, with the need to secure separate funding and sequencing of infrastructure projects to fit with developer's phasing of sites often leading to stagnation of large sites or for sites to become commercially unviable6. Whilst local councils will always consider taking on borrowing to cash-flow infrastructure projects for the benefit of communities, there is a scale at which this becomes unaffordable for the balance sheet of local councils [54]. While some interventions are dependent upon funding, there are also a range of small and medium scale developments that have stalled due to financing arrangements, indicating a need to provide additional liquidity to this small-medium site sector.

More broadly, the interlinked infrastructure challenges identified above will require significant public and private sector funding to address and therefore there is a need to develop innovative financial models.

Exeter has been pioneering a new approach to 'sustainable finance' which involves a programme to leverage the city's existing asset based across its public sector institutions and, via a City Fund vehicle, obtain commercial borrowing to create a subsidy free and commercial city wide financing and development capability that delivers place-making housing, infrastructure and communities within the city [27]. Exploring and developing these innovative funding vehicles will provide the key to unlocking much of the infrastructure delivery requirements outlined in this chapter. Therefore the Heart of the South West will:

Develop one or more funding vehicles to unlock infrastructure development.

Ensuring there is sufficient employment land to support growth

A recent study into employment land across the LEP area [55] found strong current demand for industrial workspace, which was expected to strengthen into the future. However, office demand is currently weaker, although it was expected to strengthen in some local authorities. The majority of local authorities participating in the research indicated that there was insufficient supply to meet demand, particularly for industrial space and lack of suitable and available supply has resulted in a failure to fulfil enquiries. The report found that whilst sites were available for development, the main barriers were: infrastructure, willingness of the landowner and viability.

The Heart of the South West has an ambition to ensure there is sufficient employment land to support growth. Achieving this will support productivity improvements and growth in the economy

To achieve this, the Heart of the South West will:

[Actions needed here. Expect to come from TDA led research]

⁶ This is evidenced through Planning Inspectors placing a limit on housing that can be brought forward before major infrastructure upgrades are in place

SUMMARY OF COMMITMENTS - INFRASTRUCTURE

Local Commitments

To Future Proof Energy Infrastructure, the Heart of the South West will

- Set-up a Local Energy Group to take a systems perspective on local energy
- Support the South West Energy Hub
- Support the development of innovative energy projects including: integrated systems, energy storage, renewable electricity (including community renewables), renewable and heat networks, energy storage etc.

To Future Proof Transport Infrastructure, the Heart of the South West will:

- Continue to support the Peninsula Sub-National Transport Body
- Develop strategic plans to significantly reduce carbon emissions from transport including through the development of the EV charging network, ultra-low emission vehicles and sustainable transport strategies

To Future Proof Digital Infrastructure, the Heart of the South West will:

• Develop the Heart of the South West Digital Strategy, including blended set of approaches and strategies to reduce the digital divide and ensure all areas can benefit

To accelerate housing delivery whilst minimising carbon emissions from homes, the Heart of the South West Housing Task Force will:

- Develop a strategic approach that reflects and incorporates the different needs and delivery models required across the whole area to create and deliver ambitious plans to get more homes built in an accelerated timeframe, whilst also minimising carbon emissions. This will include unlocking land and investment, detailed modelling of infrastructure requirements to unlock growth and housing action plans for strategic sites across the region.
- Develop one or more funding vehicles to unlock infrastructure development

Working in partnership to future proof Digital Infrastructure, Government will

- Pilot with the Heart of the South West the emerging 'outside-in' strategy to support nation-wide fibre coverage by 2033 recognising the challenges of achieving this within rural locations
- Pilot with the Heart of the South West approaches to provide fibre connection hubs building on the Rural Connectivity Programme and Local Full Fibre Network pilots and testing alternative approaches to the Universal Service Obligation.
- Pilot 5G solutions across urban and rural areas, supporting specific business clusters

Working in partnership to Accelerate Housing Delivery, Government will:

Work with the Heart of the South West Housing Task Force to a) assist with the skills and resources to provide
a stronger and more consistent approach to viability appraisals; b) Develop pioneering low carbon new home
developments across the area as well as improving energy performance of existing housing stock (including
hard to treat homes); c) Develop innovative funding models for infrastructure to unlock housing and boost
liquidity in the small-medium site sector

12. FOUNDATION: BUSINESS ENVIRONMENT

MISSION

"Making the Heart of the South West one of the best areas in which to start and grow a business"

The Heart of the South West's businesses are a vital asset in driving forward the clean growth agenda, providing the basis for the area's goods, services, jobs and productivity. However, the world of work is changing and support for all types of businesses must evolve.

	The Heart of the South W	'est's Str	ategic Objectives
То	help realise the ambition of making the Heart of the		
So	uth West one of the best areas in which to start and	4.	Support all business and enterprise to adopt
grow a business the key strategic objectives will be to:			innovations and create new products, services and business models including maximising the
1.	Sustain and develop a strong business support infrastructure, centered around the Growth Hub, by		Heart of the South West's digital opportunity
	further strengthening support to increase	5.	Support businesses to manage resources more
	productivity, including starting-up and scaling-up		effectively to achieve clean growth
2.	Drive further internationalisation through finance readiness and access, supporting exports and inward investment	The cor contrib	nmitments outlined in this chapter will ute to delivering these objectives.
3.	Stimulate a culture of leadership and management excellence across all of the Heart of the South West's businesses (linked to the skills foundation)		

The Business Support Landscape – An established support system

The Heart of the South West's businesses are supported by a strong knowledge base, including higher and further education as well as privately led research organisations. There are a range of university led incubators (e.g. Set Squared) and innovation centres and growing provision of degree apprenticeships in senior leadership by university led business schools.

The area also benefits from *an established Growth Hub* which provides signposting and brokerage to businesses in the Heart of the South West area, supporting both new start and existing businesses from any sector, alongside a wide network of business support organisations (public and private). A recent evaluation of the Growth Hub [56] found that it had many strengths but the report also suggested that it needed to more effectively target the underrepresented sectors and places including in the dispersed areas of the LEP. As the key vehicle for accessing local business support, there is an identified need for the Growth Hub to continue providing its signposting and brokerage services for both new start and existing businesses from any sector, as well as from the Clean Growth priorities. Learning from best practice elsewhere the Growth Hub evaluation recommended reaching out to businesses through surgeries/drop-ins linked to enterprise centres or hubs which could encourage greater engagement for businesses across the Heart of the South West's dispersed communities.

The Heart of the South West is committed to extending the reach and services offered through the Growth Hub to ensure it continues to act as the primary gateway for all business support services in the area, including skills advice (linked to the people foundation).

The Heart of the South West Business Environment

The Heart of the South West is home to 83,000 businesses, across a wide range of sectors and industries. It is home to a number of high profile businesses in all sectors that exhibit best practice and have transformative potential and these businesses are a real strength for the area [11]. However, the area has *fewer larger businesses than the national average and just 2.4% of all the UK's scale-ups are in the Heart of the South West, ranking the area towards the bottom of all LEPs.* Research shows that scale ups are more productive than their peers and generate half the total turnover of all SMEs [57]. The Heart of the South West therefore has an ambition to bring the density of scale-ups to above the UK average, moving towards the top quarter of all LEPs, helping businesses to grow and reach their potential to drive productivity improvements.

The Heart of the South West has recently launched a Scale-up pilot and will monitor and evaluate the effectiveness of this support with a view to extending it in the longer term through the Growth Hub

A key challenge for the area is *the relatively poor enterprise performance*, with the business birth rate lower than the national average [11]. This is problematic as business start-ups bring new ideas to existing markets (including clean growth) as well as introducing competition (which is good for productivity). Increasing the enterprise rate to achieve and then exceed national averages will create a more competitive business environment, addressing the long tail of productivity seen in the Heart of the South West through competitive forces. Support for start-ups through the Growth Hub will be the key mechanism to address this challenge.

From a social inclusion perspective, the growth of the social enterprise sector [58] in the heart of the South West provides an important opportunity to support inclusive growth, with evidence showing that social enterprises are more likely to innovate, grow and survive than standard SMEs as well as being more likely to pay fairly [59].

The Heart of the South West will continue to support the Social Enterprise sector through the Growth Hub.

The evidence also points to a *lower than average proportion of Foreign Owned businesses*, with a significant (34%) decline in the number of FDI project landing in the region during 2018 [60]. This is also problematic, as foreign investment in local areas can raise the number of high value jobs, add value to local supply chains, provide opportunities for collaboration with UK SMEs, increase R&D spend in the UK, develop the UK talent base and bring new technologies in to the UK ecosystem in high priority technology areas.

Increasing inward investment is challenging and research has shown that unaided markets will not deliver optimal level of investment, primarily as a result of information failure [61]. Research⁷ also suggests that businesses looking to invest in regional locations in the UK consistently report the same key investment criteria (e.g. skills, transport, land etc.). Whilst the Heart of the South West is competitive in some of these aspects, it severely lacks in others and a coordinated approach will be required.

The Heart of the South West is committed to developing this co-ordinated approach to inward investment, including targeted support and advice to increase inward investment landings in the area

Barriers to Business Growth

Evidence points to four significant barriers to business growth in the Heart of the South West:

• Leadership and management skills - Recent research into scale-ups in the Heart of the South West identified the need for a dual focus on the development of the business AND the capabilities of the business leader(s), as a driver of productivity amongst businesses. Firms grow by being aspirational, generating new ideas, taking risks and allocating resources efficiently. Established evidence shows that UK businesses

⁷ Annual Ernst & Young 'UK Attractiveness' surveys

underperform on the adoption of effective management practices relative to top performing countries and recent research shows how the Heart of the South West is especially affected by this [62].

The Heart of the South West is committed to developing a leadership and management offer as a key function of the Growth Hub to improve leadership and management skills within SMEs.

• **Digital utilisation** – Research conducted by the Heart of the South West's Digital Skills Partnership [63] has found that digital technology are transforming how businesses operate and smaller companies find it hard to keep up with the pace of change. The rate of change means that leaders and managers need the knowledge and awareness of how to drive through change efficiently and effectively. Digital transformation represents an opportunity for improving productivity growth by enabling innovation, access to markets and more efficient business processes.

Partners in the area are already providing support to businesses to improve their digital utilisation and the **Digital Skills Partnership** provides an opportunity for further co-ordination and activity, linked to the Growth Hub.

• **Financial readiness** – Stakeholders interviewed as part of the recent Growth Hub evaluation identified access to finance as a barrier to business growth but also the skills and abilities of businesses to secure funding [56]. This has been echoed in feedback from local consultations which have identified a lack of confidence from SMEs in applying for finance and in particular alternative non-bank sources. The Heart of the South West is already working closely with the British Business Bank which has been established to deliver both a greater volume and choice of finance to SMEs. It is currently undertaking a review of finance products in the South West and partners are committed to working with them to develop new financial products where there are identified gaps for both small and larger scale loans.

The Heart of the South West is committed to working with the British Business Bank to deliver new financial products where there are identified gaps.

• **Exporting** – Whilst the number of businesses exporting goods and services internationally compares well to regional averages, the value of exports per enterprise is significantly lower in the Heart of the South West than regionally, although sub-regional variation hides pockets of high export propensities within Plymouth and Somerset particularly. This reflects the high concentration of manufacturing and engineering activity in these areas, and is an area of both strength and vulnerability for the Heart of the South West [64]. A recent UKTI survey found that 85% of UKTI clients felt exporting had led them to achieve growth that would not otherwise have been possible [65].

The Heart of the South West is committed to working with its existing exporters to build resilience to changes in trading arrangements and grasp the opportunities brought by new trade agreements to grow the volume and value of exports. Exporting will also be promoted and supported more generally amongst SMEs as a means to achieve increased firm-level productivity.

Clean Businesses – Significant opportunity to reduce carbon emissions as well as improve productivity

Anecdotal evidence suggests the area has many businesses with a strong environmental ethos or operating in the clean growth sectors. However, 32% of carbon emissions (2885 ktCO2) arise from the industrial and commercial sectors, indicating the importance of decarbonising business operations [51]. Pioneering research conducted for the Greater Exeter area to develop a roadmap to energy independence suggests that there are opportunities to reduce energy demand by 9% in the commercial sector and 16% in the industrial sector by 2025 using existing technologies [22], reducing bottom-line costs to businesses and therefore improving productivity.

International evidence from the Carbon Trust [66] identified a number of barriers to SME energy efficiency including information and capacity challenges; standardisation issues; lack of economic incentives; and a lack of financial mechanisms dedicated to investment in energy efficiency.

Working with Government, the Heart of the South West is committed to developing a Green Deal in order to mainstream clean growth. This could include a range of products, for example, clean growth tax incentives to help businesses overcome financial barriers to reducing their carbon emissions.

Local partners will also investigate best practice and develop a resource efficiency programme to include energy efficiency, waste reduction, new forms of manufacturing which reduce waste, carbon capture and sustainable growth as a means of using clean growth to gain competitive advantage.

SUMMARY OF COMMITMENTS – BUSINESS ENVIRONMENT

The Heart of the South West partners will:

- Extend the reach and services offered through the Growth Hub to ensure it continues to act as the primary gateway for all business support services in the area and develop the business support offer under the Growth Hub to include support for:
 - Start-Ups, including social enterprise
 - Scale-ups
 - Digital utilisation
 - Exporting
 - o Leadership and Management
 - Resource Efficiency
- Work with the British Business Bank to deliver new financial products, including those for clean and inclusive growth
- Develop a co-ordinated approach to inward investment

Government will

- Work with the Heart of the South West to develop a Green Deal, including Clean Growth tax incentives
- Join the co-ordinated approach to inward investment through the Department for International Trade

13. FOUNDATION: PLACE

MISSION

"Ensuring prosperity for all places through Clean Growth"

Place is central to the Heart of the South West's Local Industrial Strategy. The high quality natural and built environment underpins many of the economic opportunities and strengths of the area, linked to its unique natural capital.

	The Heart of the South West's Strategic Objectives			
То	ensure prosperity for all places the key strategic			
obj	jectives will be to:	4.	Work towards all places becoming clean growth settlements	
1.	Facilitate natural capital led productivity growth			
		5.	Support the development of coastal action zones	
2.	Develop the Visitor Economy and generate higher			
	value tourism	Th	e commitments outlined in this chapter will	
		со	ntribute to delivering these objectives.	
3.	Strengthen innovation systems to maximise			
	knowledge flows and spread the benefits of			
	innovation across the entire geography			
	innovation across the entire geography			

The Natural Environment - An Area Rich in Natural Capital

Capital is most often thought of as the wealth or assets of an individual, company or nation. Natural capital refers to the world's stock of natural assets which include geology, soil, air, water and all living things. These assets provide benefits that underpin our economies and societies. As a society, we depend on the food, fuel, fibres and medicines that the environment provides, just as we depend totally on the clean air and water, the soils and flood alleviation that nature offers us. It is no different for the economy. Without a healthy, diverse, efficiently functioning natural environment, we would not have a functioning economy. Hence the UK Government recognises the importance of natural capital in achieving productivity and other socio-economic goals. The Industrial Strategy states that *'we will work not just to preserve but to enhance our natural capital – the air, water, soil and ecosystems that support all forms of life since this is an essential basis for economic growth and productivity over the long term'.*

The Heart of the South West LEP area is rich in natural capital assets – from the extensive coastlines to the North and South, through the 8 Areas of Outstanding Natural Beauty covering over 230 square miles, and two National Parks, Dartmoor and Exmoor [67]. The Heart of the South West area has 3% of England's population, 24% of the AONBs and 15% of the National Parks. It is home to a Triassic coastline, ancient woods, peat lands, willow growers, verdant pastures, abundant orchards and rich fishing grounds [68]. As well as underpinning the agriculture and tourism sectors, the area's coastline, moors, uplands and fertile farmland provide important eco-system services, as illustrated below.



The Heart of the South West is an ideal place to innovate with new approaches to natural capital led productivity growth given its:

- Reliance on abundant natural assets and the ecosystem services that derive from them to power economic growth;
- Coastline, moorlands and countryside that attract more domestic tourists than any other UK region; and,
- Employment in sectors that depend directly on natural capital, such as agriculture and fisheries, which are proportionately higher than any other UK area.

CASE STUDY: North Devon Landscape and Marine Pioneers – UNESCO Biosphere Reserve

To inform the 25 Year Environment plan four innovative pioneer projects were set up by Defra nationally with two of these being hosted by the North Devon Biosphere – the Landscape and Marine pioneers. These trial new approaches to manage farmland, natural habitats, watercourses, coasts and urban environments in a better way for people and nature, looking at new methods of funding environmental improvements and improving the capacity of resources.

These Pioneers are testing the use of natural capital in determining environmental priorities and agreeing actions to target them. At their heart is an innovative process for creating a shared plan that identifies where investment in natural capital is most needed and securing new investment for those projects.

Protecting and Enhancing the Area's Natural Capital

However, the Heart of the South West's natural capital is at risk from a variety of threats including development, agriculture and tourism but also climate change. When assets are taken for granted degradation occurs and the loss of natural capital will undermine the area's productivity potential. For example, inland areas such as Somerset Levels and Moors as well as the coastal areas suffer flood risks which pose significant threats to communities, property, transport infrastructure, tourism and agriculture as well as the natural environment [98]. This, in turn, affects economic resilience, insurance, land values and investment. The Somerset Economic Impact Assessment of the Winter 2013-14 flooding estimated a total cost to the county of £147.5m (homes, businesses, agriculture, remedial costs, transport disruption), with significant impacts for the wider region too [99].

The Heart of the South West aims to protect and enhance its natural capital assets in order ensure the sustainable functioning of the economy. This will be achieved through:

Developing a 25 year Environment Plan by 2020.

In taking forward the 25 year Environment Plan the Heart of the South West will:

- Ensure that natural capital is understood and visible;
- Ensure that natural capital can be built into decision making, where additional investment and/or partnerships are needed; and,
- Facilitate the potential for natural capital enhancement by identifying opportunities for and the promotion of eco-systems trading.

The 25 year plan will need to address the specific challenges set out in the evidence base including flood resilience. It will also need to explore innovative new solutions, such as the development of a local carbon offset system.

Natural Capital Underpinning Key Sectors

As well as providing important eco-system services, the Heart of the South West's natural environment underpins a number of bedrock sectors including tourism. However, much more needs to be done to generate higher value tourism that can contribute to the area's productivity. To achieve this ambition, the Heart of the South West will:

Develop a data led proposal for a Tourism Action Zone.

Leaders of the Visitor Economy across the Heart of the South West will develop a data led proposal for a Tourism Action Zone that supports the growth of this vital bedrock sector. This is expected to be achieved by extending the visitor season and diversifying the offer based on the Heart of the South West's natural, cultural and heritage assets. It will also involve improving the digital capabilities of businesses across the visitor economy in the utilisation of data and digital technologies to reach new markets and enhance the visitor experience. The Action Zone will contribute to Visit England's national targets whilst delivering outcomes in terms of skills development for the workforce and business owners to increase productivity. [Note: these words have been carefully crafted by the newly formed LEP tourism group. However, as it is currently framed, these words may fit better elsewhere]

The Built Environment - A Diversity of Settlements

In terms of its built environment, the Heart of the South West has a diverse mix of settlements including urban areas such as Plymouth which is home to 260,000 people, as well as rural and coastal communities where quality of life is a key attractor of talent, business location and inward investment [29]. There are potential industrial and technological powerhouses such as Plymouth and Exeter, key towns with specific sectoral strengths (Yeovil, Taunton, Bridgwater) and a plethora of smaller settlements with a wealth of innovation and enterprise opportunities.

Whilst the diversity of the area is an asset, however, its peripherally and the dispersed economy of Devon and Somerset also represent challenges for the area. Within this context the spread of knowledge generation requires a more integrated network with better working relationships to create critical mass [97]. The vital role that digital technology plays in the modern and dynamic economy is recognised within the Heart of the South West area but so are the benefits of physical proximity. Co-working spaces, casual 'water-cooler conversations' and the sharing of 'tacit' knowledge are important facilitators of innovation [101]. Research shows that "the transmission of tacit knowledge – implicitly understood but difficult to articulate – and the development of the personal trust required for true collaboration are easier when formal and informal settings are combined, and especially when you are in the same place" [101]. The Heart of the South West has an ambition to strength innovation systems to maximise knowledge flows and spread the benefits of innovation across the entire geography, in order to drive productivity growth in all areas.

To achieve this ambition, the Heart of the South West will:

Develop a network of innovation districts and collaborations clusters of appropriate scales across the entire geography.

The approach will build on existing investment and be centred on:

- Four Clean Growth Enterprise Zones across the geography: Exeter and East Devon, Oceansgate in Plymouth, Gravity and Yeovil. Whilst these already exist, more is needed to bring them fully on line. Oceansgate, for example needs £16m to unlock the third phase of development;
- Torbay Innovation Campus: a new development that would require funding, bringing together HE, FE and Local Authority partners to support photonics and marine science businesses;
- Two University Enterprise Zones in Plymouth and Exeter (currently in application with the decision pending): to support the commercialisation of research and start-ups; and,
- A network of Innovation Centres and Enterprise hubs in every town: whilst the LEP has already funded some of these much more needs to be done, supported by an overarching approach to share best practise, achieve critical mass, promote common branding and promote greater partnership working.

An Opportunity for Clean Growth Settlements

In addition, the Heart of the South West has an ambition for all places to become Clean Growth settlements, with key cities in the area having ambitions to achieve Zero Net Carbon status. To achieve an effective low carbon transition, more advanced local energy planning is needed to identify the right technologies in the right place at the right time, as has been done in Exeter in the development of their roadmap for city scale energy independence [22]. To achieve the ambition for all places to become Clean Growth settlements, the Heart of the South West will:

Develop Action Plans for all areas outlining local and inclusive priorities to deliver Clean Growth.

Clean Growth Action plans will outline locally appropriate and inclusive measures that will make a real contribution to closing the remaining 'emissions gap' to the fourth and fifth carbon budgets.

Urgent local measures are required to meet this challenge and could include:

- Green infrastructure, providing a life-support system for the Heart of the South West's towns and cities;
- Improving the energy efficiency standards of new buildings, using planning powers where possible;
- Greater near-term improvements in the energy efficiency of buildings;
- Local steps to ensure a larger proportion of energy comes from low-carbon sources, ultimately leading to 100% clean energy self-sufficiency;
- Action to drive greater uptake of ultra-low emission vehicles, including for homes/businesses which do not have their own parking places; and,
- Higher levels of tree planting and actions to reduce emissions from agriculture.

CASE STUDY: EXETER ENERGY INDEPENDENCE

Exeter has grown rapidly and is now the fastest growing city in the UK by population, accompanied by the creation of 30,000 new jobs and the emergence of new knowledge based industries. However, the Greater Exeter area consumed 10TWh of energy every year, enough to drive round the earth 1.5m times. This use is expected to grow and existing energy consumption patterns cost residents and businesses over £900m each year, money that is lost to the region. Exeter already has a world class reputation in climate change and environmental research, but partners have an ambition to make Exeter globally recognised for a wider contribution to environmental futures and have an ambition to make Greater Exeter Energy Independent by 2025. Work has started to implement this vision, with the production of a 'roadmap for city scale energy independence' which provides a detailed assessment of potential energy resources to support delivery planning.

Addressing Social Mobility

The nature of the area's dispersed communities also exacerbates low social mobility. Coastal communities are some of the most deprived areas of the UK and the economic gap between them and non-coastal communities has widened over time [69]. Evidence shows that deterioration in the some of the Heart of the South West's coastal economies, physical environments and social fabrics are adversely affecting the area. According to analysis undertaken by the Social Market Foundation, Torbay features in the bottom 10 coastal communities in Great Britain in terms of GVA growth per capita between 1997 and 2015 [69]. The Social Market Foundation analysis also showed that Torbay, North Devon and Torridge all fell within the bottom 20 local authorities in Britain for mean employee gross salaries. Partners are committed to developing a coherent response to the challenges around the Heart of the South West's coastal areas [70] and to achieve this will:

Develop 'Coastal Action Zones' to address 'stuck' coastal places.

Under the umbrella of Coastal Action Zone, tools could include, for example, enhanced capital allowances, skills development, infrastructure and business support. Partners have also identified a potential link to the opportunities presented by offshore renewables development in some coastal areas.

SUMMARY OF COMMITMENTS – PLACE

The Heart of the South West partners will:

- Develop a 25 year Environment Plan by 2020
- Develop a data led proposal for a Tourism Action Zone
- Create a network of innovation and collaboration clusters
- Develop Clean Growth Action Plans for all areas, with cities working towards the goal of Zero Net Carbon emissions

• Utilise a portfolio of tools to address 'stuck' coastal places under the Coastal Action Zone umbrella Government will

• Defra and its agencies will support the development of a 25 year Environment Plan

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