

NEW FRONTIERS

CLEAN GROWTH AND ENVIRONMENTAL MANAGEMENT



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Context

Cornwall and the Isles of Scilly is defined by its unique and beautiful natural environment. It gives this place a positive brand identity that would be worth millions on a company balance sheet. Throughout history it has also shaped our economy, as resourceful people create their livelihoods from the rich natural resources of our living land and sea.

The economic opportunities offered by our natural environment are no less distinctive today than during the first Industrial Revolution. Cornwall and the Isles of Scilly is the ideal location for global space and satellite connections, with a wealth of natural resources capable of powering the future through clean green growth.

Our environment, economy and society are inextricably connected within our local eco-system, and we have a strong record of collaborative partnership working to protect and enhance our

natural resources. Our Local Nature Partnership is delivering a clear shared vision set out in our Environmental Growth Strategy. Protection is not enough: we need environmental growth to leave Cornwall and the Isles of Scilly in a better state for future generations and to realise the distinct economic opportunities of our unique geography. Under our proposition for post-Brexit frameworks we offer to work with Government to shape British regulations, agriculture and fisheries policies that protect and enhance our environment.

Considering our industrial future, we are learning from our past, which has relied upon primary production and extractive industries, we know we need to operate differently in the future, so that our economic activities are sustainable. Therefore, accounting for our natural capital and driving the circular economy will optimise and add value to the materials we have available here.



Cornwall and the Isles of Scilly is leading the way in green energy and low carbon, as set out in the Cornwall & Isles of Scilly Local Enterprise Partnership's 10 Opportunities document. Our peninsula is energy rich, with strong established and emerging renewable energy sectors including solar, wind and geothermal. We are home to an internationally renowned research base in clean energy, circular economy, ecosystems, health and wellbeing. Cornwall and the Isles of Scilly is ideally placed to pilot innovative new approaches to the grand challenge of clean growth identified in the Industrial Strategy and our proposition would see the creation of:

- a** a Cornwall and Isles of Scilly **Energy Innovation Zone**, working collaboratively with the West Midlands Combined Authority to trial key technology and social innovations with partners from across the energy industry - using Cornwall and the Isles of Scilly as a living laboratory to identify practical policy and regulatory solutions to transforming energy systems in a rural environment.
- b** complemented by an **Energy Futures Observatory** at Exeter University's Penryn campus, leading a funded programme of clean energy research building on our existing £30

million investment in exploring future energy markets and world renowned research, and developing the STEM skilled workforce those future markets require.

- c** a **secure supply of the lithium required for batteries in electric cars** following the ban on new petrol and diesel cars from 2040, supporting the Industrial Strategy focus on future mobility, through a comprehensive public research and development programme alongside commercial extraction of Cornwall's lithium resource - which is strategically significant at a UK level as we have seen increasing demand triple the spot price of lithium in twelve months.

Further, we offer unique conditions to address the legacies of our industrial past while creating future opportunities by applying the natural capital and circular economy approaches, specifically on two important issues:

- d Mining management** – Learning from Legacies to drive future innovation
- e Marine Plastics** – A local systems approach to a global problem.

Each of these propositions is set out in more detail on the following pages.

We need environmental growth to leave Cornwall and the Isles of Scilly in a better state for future generations and to realise the distinct economic opportunities of our unique geography

ENERGY INNOVATION ZONE

Unlocking barriers

The rationale for change

Energy generation, demand and control systems are fundamentally changing, driven by the digitisation of the electricity system, falling costs for renewable energy and storage, and a desire from companies and individuals to do things differently.

These changes provide opportunities for a more customer focused, energy efficient, cheaper system. They also create new challenges for the industry, policy makers and the regulator, and the wider institutions developed around our current top-down centralised energy system.

The best solutions reflect local circumstances and existing local infrastructure. Future energy systems will need to be far more decentralised and take a whole systems approach. Regional and local energy solutions - both for how the physical infrastructure is used and developed, and also the wider governance for the range of actors involved in energy system change - are of increasing importance.

Our ask

Cornwall and the Isles of Scilly propose to create a rural Energy Innovation Zone, a living laboratory to pilot new regulatory and policy approaches across heat, transport and power, working collaboratively with the West Midlands Combined Authority. The Energy Innovation Zone would drive bottom-up system optimisation and trial innovative new approaches, including policy and regulatory change. It would provide an enabling environment for partners - across the energy industry, national government, the energy regulator, key innovation funders, communities, and regional centres of excellence like the University of Exeter, the Centre for Sustainable Energy and Regen South West - to identify practical solutions to challenges and trial key technology and social innovations.



Our offer

Cornwall and the Isles of Scilly are at the cutting edge of energy innovation. Our Cornwall Local Energy Market pilot with Centrica, and the Council of the Isles of Scilly's (CIOS) Smart Islands project with Hitachi showcased in the Industrial Strategy are nationally significant energy innovation projects. We are delivering strongly against our Devolution Deal commitments with a Marine Enterprise Zone, an Energy System and Storage Masterplan, a Local Supply blueprint, and an Energy Company Obligation (ECO) Flex Eligibility pilot.

We have around **£115 million private sector investment in innovative low carbon projects** over the next four years, piloting smart solutions, local energy markets, deep geothermal, sustainable transport and energy efficiency – with a need to overcome regulatory and policy barriers in order to roll out. Our well established relationships between key partners - including both Councils, the Local Enterprise Partnership, the District Network Operator, key local employers, research organisations and community energy groups – are a further key strength of our proposition.

Benefits

Cornwall and the Isles of Scilly are at the cutting edge of energy system transformation. The Energy Innovation Zone will further strengthen work between partners - including national government – to trial innovative new approaches including piloting regulatory changes to overcome barriers to change. As other countries move to regulate network companies to deliver public goals - such as decarbonisation, storage integration, and providing market platforms - the Energy Innovation Zone would potentially provide a platform to explore and trial Ofgem and BEIS interest in how changes to the role of distribution operators might apply in the UK.

Through the Energy Innovation Zone, Cornwall and the Isles of Scilly will develop a **blueprint for smart flexible energy ecosystems capable of being rolled out to other rural areas** of the UK with defined end-user benefits. This blueprint will support the Energy Future vision of community participation, industry driven solutions, and intelligent networks that balance power generation and demand all the way to the consumer level.



Cornwall and the Isles of Scilly are at the cutting edge of energy system transformation

DEVELOPING FUTURE ENERGY MARKETS

Unlocking barriers

The rationale for change

At the same time as local systems need to adapt and innovate to meet the challenges of a changing energy system, the UK needs to stay at the cutting edge of research into future energy markets. We are investing £30 million of ERDF funding in major research and development programmes engaging utility companies, distribution network operators, and the University of Exeter. Our internationally renowned research base and culture of innovation and exploration makes Cornwall and the Isles of Scilly ideally placed to develop future energy markets.

Our ask

Cornwall and Isles of Scilly proposes the creation of an **Energy Futures Observatory**, building on the expertise in Cornwall at Exeter University's Penryn campus. The Energy Futures Observatory would lead a collaborative cross-sector programme of research, development and innovation support for future energy markets, infrastructure and enabling technologies. Recognising workforce challenges for future energy markets, it would promote STEM careers through improved educational pathways, skills accelerators and CPD building on existing higher/further education links and business engagement.

Our offer

Cornwall and the Isles of Scilly is ideally placed to address the grand challenge of clean growth identified in the Industrial Strategy. Our environment is rich in natural geothermal, wind and solar assets, and we offer strong cross-sector partnerships working at the cutting edge of both research development and practical application of innovative future energy solutions. Our leading research base is informing government policy on future energy provision in the wake of concerns on reliability of imported energy, including through our Engineering and Physical Sciences Research Council funded iGOV programme.

Benefits

The Energy Futures Observatory will harness research and education capabilities in renewable energy, energy policy, economics and investment, technology development and environmental assessment. The Energy Futures Observatory will complement the proposed Energy Innovation Zone - providing cutting-edge research and development, to inform practical innovation and trials in our living laboratory to overcome the challenges associated with locating, installing and managing complex energy systems within a rural environment. The research led by the Observatory will provide cross benefit to future mobility challenges through electric vehicle growth which can be translated to other similarly positioned regions of the UK and beyond, and strengthen regional energy expertise through improved Higher Level Skills provision, and greater collaboration between business, higher and further education.

DEVELOPING OUR LITHIUM RESOURCE

Unlocking barriers

The rationale for change

Lithium resource in Cornwall could be strategically significant at a UK level, especially as the demand for lithium has increased dramatically with the spot price tripling in the last 12 months. Demand could further significantly increase from current usage from day-to-day devices (about 0.3g in a mobile phone), due to growing demand for electric vehicle batteries (using around 9kg). A global supply to meet this demand will be challenging to obtain. There is potential for the UK to be as near to Lithium self-sufficient as possible from the Cornwall supply; this is an opportunity which has enormous potential. Thus, through exploring the opportunity to extract the raw material and add value locally, securing a supply of the lithium required for batteries in electric cars following the ban on new petrol and diesel cars from 2040 fundamentally supports the Industrial Strategy focus on future mobility – as well as putting Cornwall and the Isles of Scilly at the forefront of the circular economy and energy revolution. Alongside significant lithium resource, we

offer global leading extraction expertise in our world renowned Camborne School of Mines, together with significant existing investment in geothermal projects that will enable efficient and sustainable extraction, and interest from a number of commercial companies offering parallel investment.

Lithium exploration is currently entirely reliant on private sector investment, and while some has been forthcoming, progress is slow and findings remain commercially sensitive. Significant public sector investment in lithium exploration would quickly establish whether there are commercially viable deposits, and potentially place the UK at a competitive advantage. It is expected that the brines required for the extraction of the resource will be found in the same geological structures as the geothermal hot waters circulating through natural fractures that we will be exploring early next year for electricity generation. As a result there is an opportunity to start exploration within the next year, through one or more publicly funded science-focused projects running alongside the commercially-focused operations for deep geothermal and lithium extraction.



Our ask

Research, innovation and development funding is required to accelerate the understanding of the opportunity, multiple benefits potential and identify optimum sites to commercially exploit the lithium and deep geothermal resource in Cornwall, providing a secure supply for the battery industry in the UK. A comprehensive research programme could cost in the region of £20-30 million with scope to start early with smaller sums.

Our offer

The production of lithium in Cornwall would provide the UK with a secure supply of the strategic mineral required for batteries used in electric cars following the ban of new petrol and diesel cars from 2040. Rising demand has tripled the lithium spot price in the past year, and our lithium resources are potentially strategically significant for the UK.

Cornwall and the Isles of Scilly is already investing over £15 million in deep geothermal through a mix of ERDF and Cornwall Council funding, with drilling to depths of 4.5 km beginning in early 2018, and a second geothermal project is proposed subject to funding.

Camborne School of Mines has an international reputation and undertakes a wide range of industrially-focused research across the mining value chain in Cornwall and internationally in the global mining industry. It is partnering with Cornish Lithium and the BGS on a £600k satellite imagery project to help identify the lithium resource funded by Innovate UK and Cornish Lithium has already secured £1m private sector investment to undertake some initial exploratory work.

Benefits

Our assumptions are based on findings in Nevada where the average grade of their brine is similar to those in some historic records from Cornwall (around 120ppm) and sourced from a similar depth. If lithium is successfully exploited commercially it is anticipated that by 2030 there could be three extraction plants and one refinery in Cornwall, collectively creating 460 jobs, ranging in value from engineers, maintenance, technicians to security jobs. Each extraction plant could produce in the region of 8,000-9,000 tonnes of battery grade lithium per annum, the equivalent of 500,000 Tesla EV batteries, far exceeding the amount imported into the UK in 2014. Based on the current lowest trading price this is worth 400m US\$ (£303m), this amount of export sales would improve Cornwall's GVA by an additional £129m, over 1% increase.

The scientific learning, academic methods, technological advances and expertise could also be developed in Cornwall and the UK and exported, supporting the creation of a UK Mining Centre supporting the Clean Growth agenda, building on Camborne School of Mines international reputation. Using the CSM alumni network, research and teaching excellence this would develop a global network with international experience, outlook and knowledge to confront global challenges and operate in a global context.

Our proposition would cement university and business linkages, supporting a globally mobile talent pool and a multinational base for discovery and innovation, and developing strong commercial relationships with global mining industry to power the supply chain in Cornwall.

NATURAL CAPITAL AND THE CIRCULAR ECONOMY

Context

In Cornwall and Scilly our ambition is to create an economy of place-based businesses, where each of our businesses are actively aware of, and contributing to its ecological place, as a part of their investment into a sustainable future. In the south west we are fundamentally reliant on our natural capital for our industries, and the CIOs LEP 'Ten Opportunities' highlights this with 7/10 of the opportunities being reliant upon or having a direct impact upon our environment and natural systems. Therefore, awareness of our natural capital and the benefits of the creating a circular economy which asks us to optimise the value of the precious resources and invested energy in products we use and create by developing the physical and cultural management systems critical to achieving global sustainability.

The CIOs LEP-led Cornwall Materials Charter and the emerging Circular Cornwall Group, which is bringing together the growing number of businesses innovating in this sector, offers the

foundation of a community of locally and globally net positive businesses and the emergence of the evidence-based policy conditions to support them. We are also an active partner in the NERC funded University of Exeter-led, South West Economic and Environment Partnership, which is seeking to increase the impact of research into the constraints and opportunities for businesses from the natural capital in the south west. These overarching projects are supported at an individual business level by our Environmental Growth for Business project, an ERDF funded project led by the University of Exeter's Circular Economy Centre and Environmental and Sustainability Institute. This project links these two critical perspectives together, to provide the opportunity for businesses in Cornwall and Scilly to gain an understanding of its unique place into the ecological system locally and globally, and the opportunities for their business to become more 'circular'. This is essential if we are to have a net positive impact – economically, socially and environmentally.

Unlocking barriers

The rationale for change

The future health of our natural capital is critical to our societal and economic health, and for us to be sustainable we need to address some legacy issues while also ensuring economic growth in the future is carefully managed and planned.

The context above demonstrates where we are self-organising and utilising funding opportunities to bring and apply these new perspectives locally. We would like Government support for the following initiatives which all build on our particular strengths to address global challenges. Our ask is for our projects to be given a national profile, engaged support from Government Departments, and supporting funding where appropriate. Each project makes a specific ask and offer below.

Mining management - learning from legacies

Mining has been the foundation for Cornwall's globally recognised place in the Industrial Revolution, and it has an increasingly promising future too, as one of the CIOs LEP Ten Opportunities.

Environmental legacies of past mining activities do create significant risks to Cornwall; however, addressing them also presents opportunities. The technology needed to manage our challenges is innovative and offers new frontiers of microbial, chemical, earth and materials science. Working practises for new mining activities can be finessed to ensure that future harvesting of natural resources is done as sensitively as possible; landscape restoration practises can provide new and improved habitats as well as land for development. By thinking carefully about how we respond to past legacies and new industries we could make substantial contributions to the creation of a circular economy and sustainable environment.

Our ask

We would like to request the following from Government:

- Support from DEFRA, BEIS and DCMS to create a multi-agency task group on mining management and regulation – initiated in Cornwall but with the potential for a national remit.
- A specific agreement with the Coal Authority to support Cornwall Council's approach to quality assurance and legacy management of new mining enterprises.

Our offer

For different purposes, there are good local partnership working arrangements with Historic England, Natural England, the Environment Agency, Marine Management Organisation, Coal Authority, Camborne School of Mines (and other university departments) and our active mining companies, within Cornwall. However, they have not been convened together to focus on the challenge of this globally important industry.

Cornwall offers a unique opportunity to develop a 'cradle to grave' systems thinking approach, which uses innovative technologies, management practises, policies and governance structures to ensure mining for mineral resources on land and at sea can have a net positive impact of the localities it is undertaken within around the world.

Benefits

Our approach would seek to realise the following benefits. We would be taking collective responsibility for the legacy impacts and future potential of mining in Cornwall, to ensure that we learn from the past and optimise our opportunities. We would, through our alignment, offer greater certainty to new business ventures in Cornwall, by having clear expectations on necessary working practises and legacy management. We would also minimise costs to statutory bodies by creating jointly agreed plans and methods for intervening on sensitive sites. We would be promoting the knowledge exchange between those pioneering new extraction technologies, regulators and those managing legacies. We would be developing national and international expertise in Cornwall to contribute to our knowledge economy and which has export potential for the UK.

We would, through our alignment, offer greater certainty to new business ventures by having clear expectations on necessary working practises and legacy management

MARINE PLASTICS

Unlocking barriers

The rationale for change

Our ambition is to be the world's first 'net extractor' of marine plastic.

By 2050 it is predicted that there will be more plastic in the sea than fish unless bold steps are taken. This would be an ecological and public health disaster. Consequently, the issue of domestic and marine plastic litter has now reached the national public consciousness in a powerful way; much of the messaging has long been spearheaded by Cornish activists, scientists and conservationists, such as Clean Cornwall, SAS, Cornwall Plastic Pollution Coalition, Your Shore Beach Rangers and The Final Straw campaigners. Penzance was the first town in the UK to win 'plastic-free status', as local businesses, voluntary organisations and the town council coalesce around plastic-free initiatives in the area. More towns in Cornwall and across the country are now following their example, building on the strong network of beach cleaning/litter collection groups in our coastal communities. 'Refuse', reduce, reuse, recycle is rapidly being adopted as the new waste hierarchy.

Cornwall's peninsular position within global ocean currents means that it is likely that we receive more marine plastic on our shores than we omit, mainly due to better waste management practises in Europe than in other parts of the world. In 2017/18 our storms were locally known as the 'Plastic Storms', as the volume of plastic washed up on high tides is increasing notably.

To tackle the sheer scale of this problem will require a bold and unprecedented approach: one that is based on the principles of the circular economy and one that puts Cornwall at the forefront of this movement. We propose that Cornwall could become the world's first net extractor of marine plastics. To do this takes a systems thinking approach – where the public, policy makers, regulators, businesses and the research community all need to come together to examine how our existing system could be adjusted and improved to rapidly accelerate our ability to stop plastics entering waterways and the sea and to the extract plastic from the oceans.



Our ask

Facilitation of a 'systems approach to marine plastic'

Tackling this problem will take partnership and experimentation to learn what is required on a global scale. Therefore, we are proposing the creation of Marine Plastic Task Force based in Cornwall which will develop a work programme to show the potential of:

- Reviewing waste legislation and regulations that impacts at a local level to better facilitate collection and removal of plastic from the coastal environment.
- Reviewing legislation and regulatory capacity to ensure plastic does not enter waterways or the sea
- Direct investment into recycling infrastructure and facilities to support the extraction of marine plastics
- Direct investment into research and development for uses of the extracted materials.
- An improved regulatory environment for businesses developing expertise in plastics reprocessing.
- Incentives that would encourage businesses to cluster to share research, reprocessing and production facilities.
- Integration of available and new data and technology to analyse and monitor the scale of the problem and impact of policy actions.
- National investment in incentives and support schemes encouraging the fishing sector and coastal communities to extract marine plastics from our shores, such as the 'Fishing for Litter', Fathoms Free and 2-minute beach clean initiatives.

Our offer

Cornwall is already demonstrating leadership in this area, with a many communities and entrepreneurs motivated by our close connection to the sea. We have a strong marine conservation voluntary sector that has pioneered global plastic reduction campaigns²⁹, we have coastal communities who regularly mobilise for beach cleans, we have local businesses leading the way on plastic reduction in their day-to-day operations and innovative companies who are developing new plastic recycling technologies. Cornwall's communities collaborate and mobilise to protect their environment, demonstrating how our relationship to our natural capital has an important role to play in social cohesion, capacity and capability, to which our highly effective network of third sector organisations reflect.

We also have a public sector that is wholly supportive of this movement; Cornwall Council and the Environment Agency are working with ARGANS a south west company³⁰ to establish the degree to which satellite data can be used to monitor this issue and direct resources under the 'Space for Smarter Government' Programme. The Environment Agency has also established a marine plastics team in the region to ensure their practises and procedures take the maximum opportunities to prevent plastics reaching the ocean.

Ultimately, our ambition is to create a local system that is extracting marine plastic and using it as an economic and social resource, creating new businesses and jobs. We will identify the conditions and investment needed to create a state of the art cluster of plastic recycling businesses, pulling together existing Cornish companies, and attracting new ones to join them to innovative marine and domestic plastics recycling technology, along with product development and design.

²⁹ <https://www.sas.org.uk/our-work/plastic-pollution/>

³⁰ <https://argans.co.uk/>

Following the recommendations of the New Plastic economy report (2016)³¹, the cluster would specialise in recycling with radically improved economics and quality and also have an R&D focus on redesign and innovation of existing products for better reuse. It will build on existing expertise and projects such as the MR6 Bitumen substitute currently being pioneered in Cumbria, the Networks Project³² which converts fishing nets to floor tiles. It will bring together existing local specialism such as the Fathoms Free³³ project that recycles marine plastics to create kayaks or the Flexi-hex company that pioneers plastic-alternative forms of biodegradable packaging³⁴. The objective will be to innovate and produce additional products which can be replicated globally. Cornwall will lead on an economically and environmentally sound approach to plastics recycling and help to develop a growing domestic and international market for environmentally sound products.

Benefits

There is a global momentum to rethink plastics and Cornwall has the potential to help the UK become a global leader on designing the whole system approach needed to tackle the issue of marine plastics. To stake a legitimate claim for the title of first 'net extractor' of plastics would demonstrate we have designed a system to empower communities and businesses to take action; regulated and enforced conditions on those contributing to the problem and established a system to evidence that our interventions were having a demonstrable impact. The Cornish economy will benefit as this sector grows with new job creation and supply chain development. Community cohesion will continue to grow around a common goal of marine plastic extraction, plastic aware lifestyles; playing our part in setting a global standard which others can observe and learn from. Cornish expertise could then be exported to those countries who are net producers of marine plastic litter, helping to tackle the problem at its source.

The Cornish economy will benefit as this sector grows with new job creation and supply chain development

³¹ <https://www.weforum.org/reports/the-new-plastics-economy-catalysing-action>

³² <http://net-works.com/about-net-works/#next-steps>

³³ <https://fathomsfree.org/>

³⁴ <https://www.flexi-hex.com/>