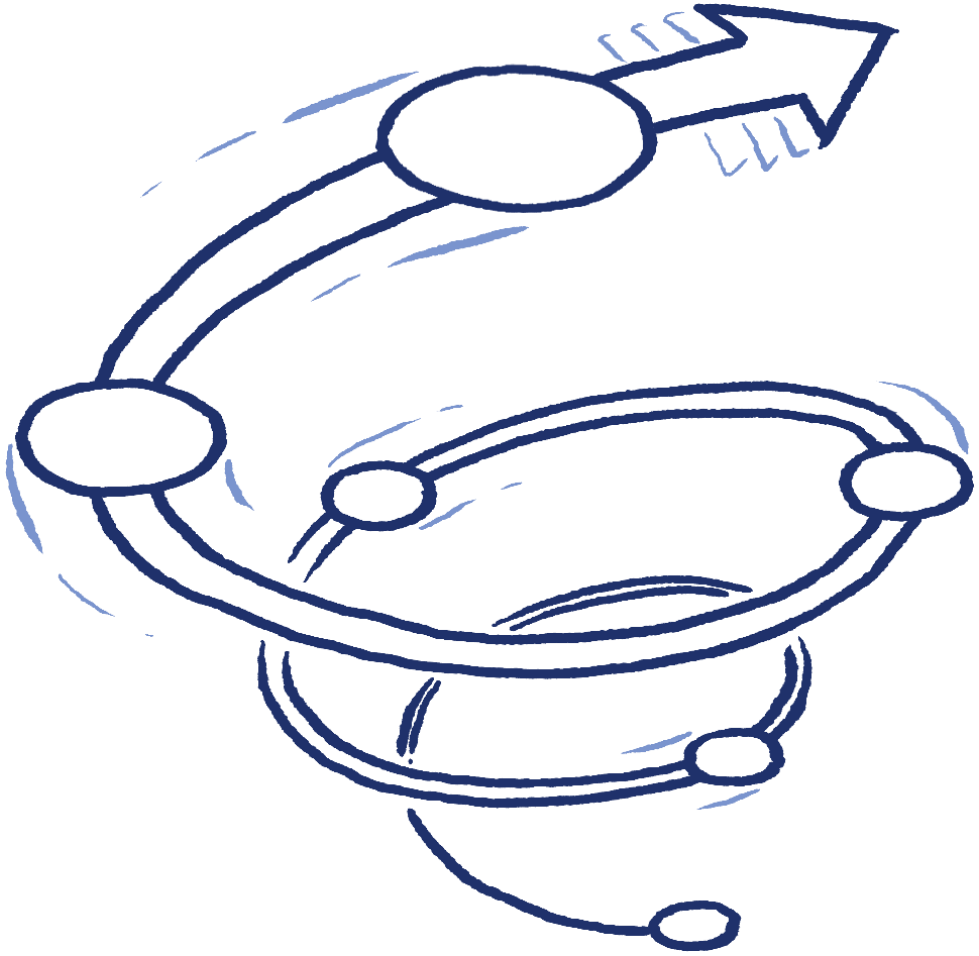
Future ports: Barry

Triggering a virtuous growth cycle for the town and Port



ASSOCIATED BRITISH PORTS

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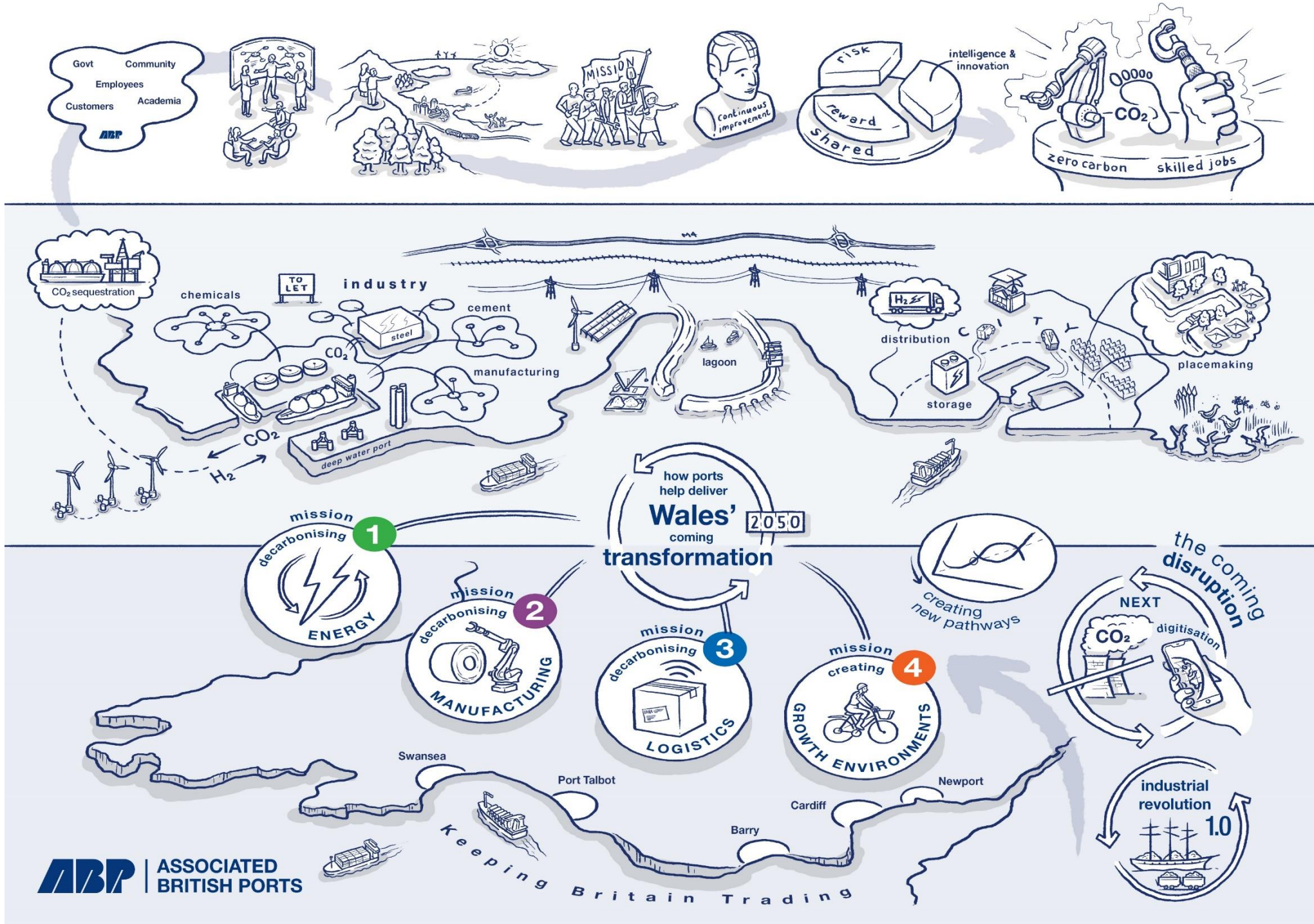
Our thinking about the Port of Barry's future sits within our wider vision for our Welsh ports

Find out more about how ports can help deliver Wales' coming transformation at www.abports.co.uk/future-ports-wales-vision/



Foreword

The future is always going to be something of an enigma, but the future of the town and Port of Barry presents us with a puzzle more interesting than most. This vision paper represents our attempt at trying to get the pieces of that puzzle into some kind of order. We hope you find the results interesting – not because the puzzle has been finally cracked, but instead as a broad guide to how we think the solutions might evolve.

Thinking about the 'big moves' we need to make in future has been a revealing process. We have worked with partners in Barry on what has been called 'the gentle art of re-perceiving', and we see an exciting chance to create a new growth ecosystem in the town. We envisage a new waterfront environment hosting new jobs, new businesses, new sport and leisure opportunities and new communities around a new Marina, and two big strategic industrial initiatives that can put the town on a fresh growth pathway that takes us to net zero.

As well as thinking about what we need to do, we have also been thinking how we need to do it. The concept of the virtuous cycle runs through this vision paper. We are seeking to sequence investments in a way that creates a positive feedback loop in which each project propels the next project forwards, building that essential force which remains surprisingly under-appreciated in business and development: the force of momentum.

We want that momentum to help create wider benefits that spill out beyond the port. The projects we identify in Barry help us to deliver on the four missions we set out in our Wales Vision - to ensure our ports help Wales to create a pro-growth environment, as well as to help Wales decarbonize its energy supply, manufacturing industry, and logistics industry. Our approach in this Vision also aligns perfectly with the emerging strategic framework being built across the UK and Wales - including the UK Government's Levelling Up White Paper, Welsh Government strategies (including the framework in Manufacturing Future for Wales). It also reinforces the exciting work being carried out by the Western Gateway, Cardiff City Region, and the Vale of Glamorgan itself.

These issues are hugely wide-ranging. Market failures mean that public sector intervention will be necessary. The market under-prices the positive externalities created by the marina, so public intervention is needed; and getting some form of carbon pricing in place is likely to be important if carbon sequestration and hydrogen markets are to work to the full extent envisaged here.

More locally, a genuinely transformational offer will require collaboration involving ABP, our customers, stakeholders, supply chain companies, and local communities. We at ABP want to play a key role in that team. We hope to take an enlightened view of the symbiotic relationship between commercial investment viability and community prosperity – including better use of public investment to crowd in private investment, and vice versa.

Inevitably, some of the puzzle that the future presents will remain unsolved for now. That is the way of things.

But we do feel sure that, with its history of ingenuity and habit of reinvention, Barry's ability to solve the problems of the next industrial revolution will be as convincing as it has been in industrial revolutions past.

We look forward to working with you to make it happen.

Andrew Harston
Regional Director, ABP Wales & Short Sea Ports

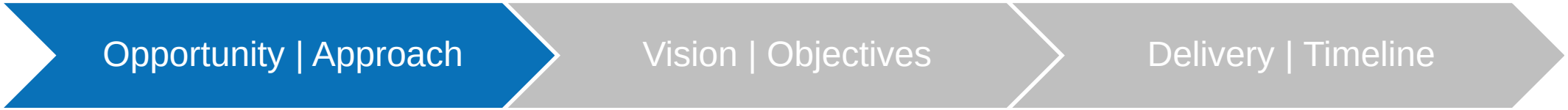
The Port of Barry today

Total acreage (land & water)	611 acres
Total acreage (land)	443 acres
No.1 Dock frontage	1,580 m
No.2 Dock frontage	2,838 m
No.3 Dock frontage	622 m

Source: ABP website

1: The Mole
2: No.1 Dock
3: Battery Hill & Yacht Club
4: Lady Windsor Lock
5: No.3 Dock
6: Windward Terminal
7: Barry Solar Farm
8: Atlantic Crescent
9: David Davies Road
10: No.2 Dock
11. Cleared industrial area – the future 'Black Rocks' area
12. Rail Container Terminal
13. Navigator Terminals site
14. Navigator Terminals berth
15. Dow UK complex
16. Sully Moors Road area – the future 'Port Clean Growth Hub'
17: The Pony Paddock

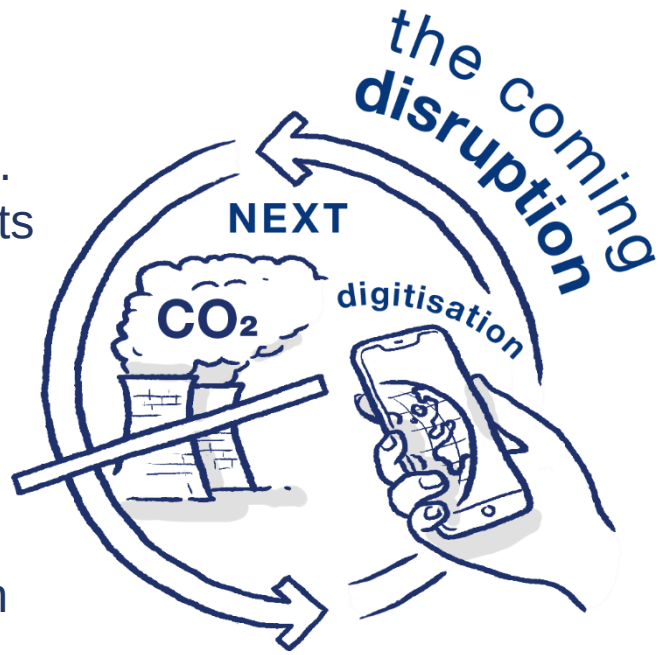
Part 1 – Opportunity | Approach



Two decades of transformational change are on their way. But think gain, not pain

Energy and knowledge form some of the foundations of the global economy. These foundations are moving: in coming decades, structural economic shifts associated with decarbonisation and data digitisation are going to create a new set of consumption, production and investment patterns. Alongside thousands of other towns and cities around the world, Barry is going to be deeply affected, and needs to start thinking about how it will make this shift.

If we use this time of disruption skilfully, we can find entirely new business opportunities, shake up existing economic patterns, and drive-up incomes in less well-off areas. But we are under no illusions. The journey to a net zero carbon economy in Barry will need joint public and private investment on a scale not seen for decades.



Barry has seen radical innovations before. It can again

Barry should be confident about its ability to make the big changes needed. It has a revolutionary history: Barry grew from being a tiny village of 100 people in 1871 to the largest coal export facility in the world by 1913. The innovations kept coming: as the coal boom worked itself out, Barry was able to switch onto new growth pathways, moving into tourism and the chemical sector.

Through the last decade, Barry has seen a new round of innovation. Barry has been able to reinvent its waterfront with a new residential offer at No 1 Dock. This has been a success: a well-designed strategy has taken vacant land and created new communities, with the benefits we see today.

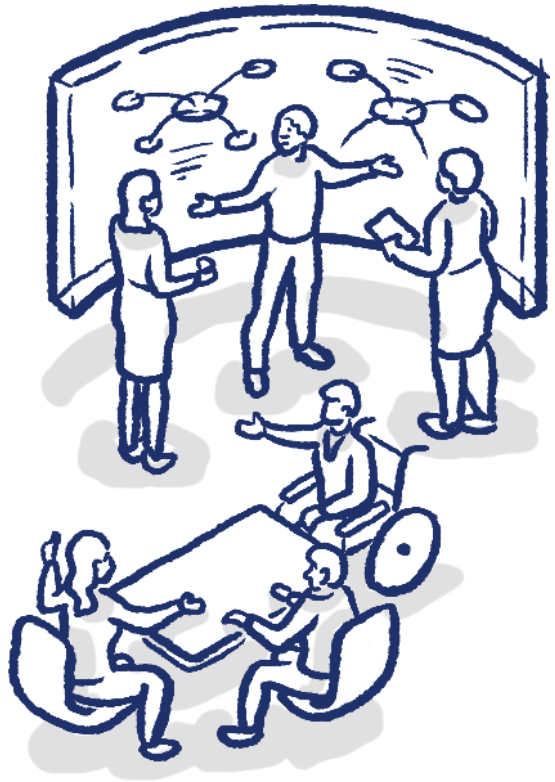
But the pace of positive change in Barry has now slowed. There has been little alteration in the core maritime and industrial businesses in Barry for over a decade, and the pipeline of housing sites is drying up: the house building consortium is presently developing the last remaining residential development site at East Quay.

Aerial view of Barry, 1929
image credit: CBHC / RCAHMW

This Vision aims to help Barry get the future it wants

We see exciting opportunities developing in Barry. With strategic investment at the Marina and Mole, No.1 Dock will complete the last decade's shift into new, non-port uses. We can then use that momentum to trigger a jump towards a zero carbon economy at No.2 Dock. Together, these changes will complete Barry's shift onto a new growth pathway that will create prosperity in a zero carbon world.

We think we know how this can happen. Here, we present a systems-led approach which shows how we can work with partners to build a process of change in which one innovation triggers the next.



We need to restart the innovation process

We think it is the right time for a new approach in Barry that will contribute to a better town and build a better Port for the future. Over the next two to five years, we can create a dynamic new process that creates long-lasting benefits for Barry, the Vale, and for Wales.

But first, we need to understand why the rate of innovation has slowed. We will then have a better chance of designing interventions that can have a real, positive impact.

How innovative systems can get ‘stuck’

Like all towns and ports around the world, Barry is an urban and industrial ‘system’ made up of a huge number of components. Each of these components influences the others in a dense web of relationships between town and port, port and industry, industry and workforce, workforce and housing provision, and so on. This is what is known as a chain link system – so-called because, like any chain, the performance of the whole is determined by its weakest links. With chain-link systems, it is easy to get stuck in a sub-optimal state. That is because when the system elements are managed separately, there is little incentive to make innovations (such as investments or upgrades) at any one point in the system, because improvements in one area are undercut by weaknesses elsewhere. Innovation is therefore disincentivised.

Our view is that the weaknesses of the existing chain link system at both the town and Port are now asserting themselves. These problems ripple outwards: under-investment in one area creates a cycle of low investment in another.

The shared task for us all in both the public and private sector is to get a co-ordinated plan to address the weak links, drive up quality, and get onto a new growth pathway.

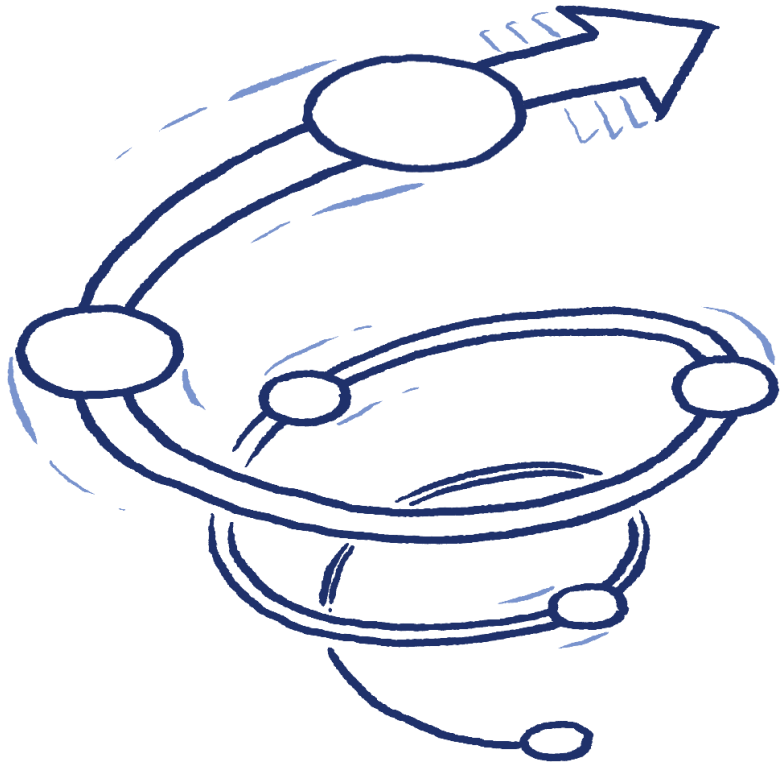
We want to set out a sequence of moves that are explicitly targeted at freeing up the chain-link mechanism we have identified.

Our objective: creating a virtuous cycle that builds investment momentum

We are looking to create a cascade of positive outcomes that make a real, lasting difference to Barry. Right now – which is early in the change process – we believe that the most efficient way of achieving those objectives is likely to be something similar to the process set out here.

We will start the process by addressing the fundamental quality and capacity constraints which are throttling growth. We will then sequence a series of projects which are designed to build on the new capacity, and create a virtuous cycle of growth. This is a dynamic process: we have got to find ways of making sure that both public and private sector investments are co-ordinated in time and place, so that they reinforce one another - and so maximise impact.

We know that the real world will never be quite as neat as the vision we are setting out here, and it is entirely possible that some projects might evolve in parallel, happen in a slightly different order – or even not happen at all. We expect to absorb these bumps in the road as we progress. We do have a Plan B – which we explain shortly – but we do not want to have to implement it.



How the virtuous cycle is triggered – and sustained

This diagram sets how we aim to spark off the process of change.

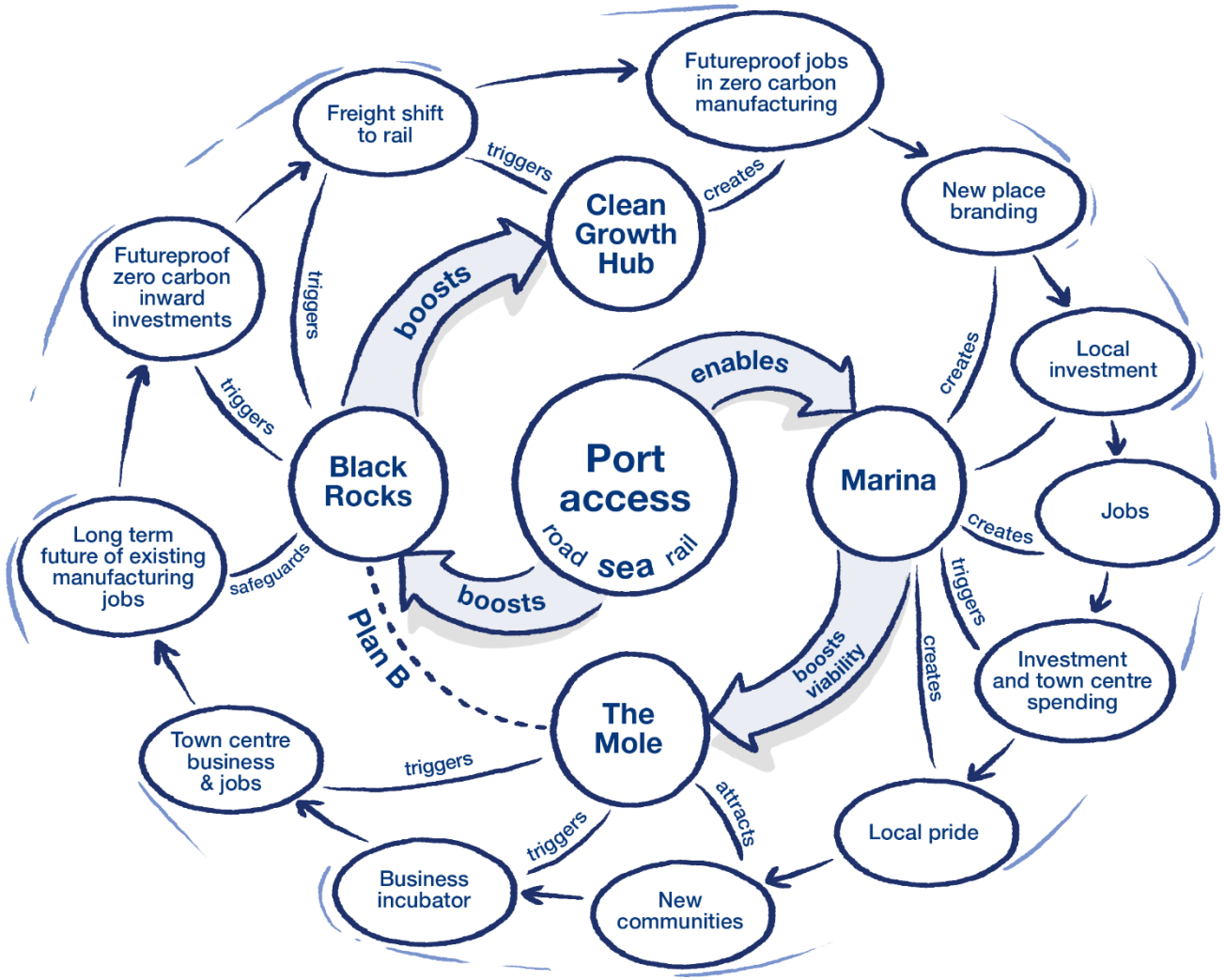
We start with the Port Access Project, at the centre of the diagram. This focuses on marine access, but will also widen to include road and rail in future. It deals with the major chain-link weakness we have at the port – and makes subsequent cycles of change possible.

This project creates the marine capacity needed for the Marina project – with all the consequent benefits – and in turn **acts on the Mole as an accelerant and enabler for the development of the business incubator, parkland, residential communities and shared community facilities**. This moves Barry onto a new cycle of innovative and sustainable growth in a post-Covid, post-carbon economy.

The Port Access Project at the lock may help kick off a separate cycle of growth. The basin dredge element necessary to deliver the lock project may help facilitate access for the next generation of coastal vessels that may come to serve the future market in carbon sequestration and, possibly, hydrogen supply. We should be clear that i) these are longer term, more uncertain opportunities (possibly on 10 year-plus timeline); ii) the Access Project is not sufficient to deliver these opportunities alone; and iii) future projects of this type will need separate public investments. But it is possible that the Port Access Project prepares some of the way for these innovations at the industrial sites at the eastern side of the port.

Of these industrial sites, the Black Rocks site is likely to come forward first. The project will then create the facilities and investor confidence needed to see development at the 110 acre site on Sully Moors Road that we have designated this the 'Clean Growth Hub'. For Barry's future economy, this is crucially important: it safeguards jobs in the existing chemicals sector, and creates the opportunity for a new cycle of growth in a low- and zero carbon manufacturing cluster.

We provide more detail on each of these projects in Part 2 of this paper.



What if we cannot trigger the virtuous cycle? What is Plan B?

As we have shown above, the Port Access Project is critical in triggering the virtuous cycle we are looking for. The key risk at this stage is a failure to get this project funded from a combination of public regeneration funding and private sources.

If that happens, we will move to Plan B. Plan B puts us onto a very much slower growth track. Some things will not happen. If there is no Port Access Project, then there will be no marina, because the water loss associated with operating a large lock for large numbers of smaller craft would render the water levels inside the Dock unsafe for commercial shipping. (There are 600 people employed at the Dow UK plant, we would not want to do anything which endangered those jobs). If we lose the Marina, we lose the animation of the Barry waterfront, the incubator, and the marina-related public spaces that we wish to create.

The loss of the Marina project would have an impact on development at the rest of the Mole. We are depending on the spin-out effects of the Marina to make development on the rest of the Mole more attractive. Without the Marina, we would likely delay development – although we would probably continue to try to get something away.

Then, if residential regeneration at the Mole was delayed, or never happened, that would mean that the current semi-derelict environment at the Mole would remain. Our best guess is that the site would stay vacant for a decade. Clearly, successful business incubator and community facilities would be very much harder to develop in such an environment.

Industrial development could take place at the Black Rocks and Clean Growth Hub sites, even if the Port Access Project never happens. But it may be sub-optimal for Wales. As we have pointed out above, the lack of improvements to marine access may reduce the Port's ability to accommodate the future vessels that will be needed to help Wales decarbonise. This is a longer-term impact, and CO2 sequestration will need wider public investment in any event, but the lack of support for the project now could reduce our ability to prepare the way for the next generation of industrial development at the Black Rocks site and the Clean Growth Hub.

It is important not to exaggerate these effects, and we are not saying that the future of the Port depends on resolving port access problems. Some projects might go ahead in some form.

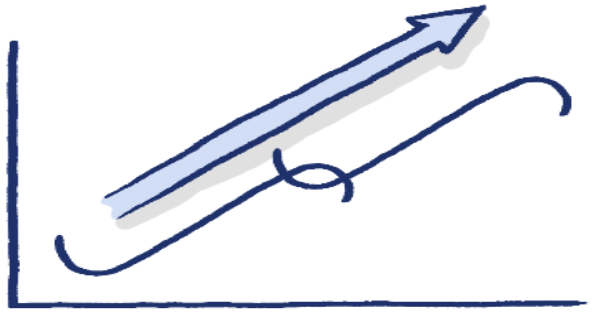
But the virtuous cycle we have described would not operate in the way we describe them here. Some projects clearly would not happen, and those that did would a) be at greater risk, b) be more likely to be delayed by a number of years, and c) would be of lower value to Barry and the wider community if they did take place in some form.

Success will require new ways of thinking

We need a virtuous cycle of change. But to get this virtuous cycle spinning, public and private sectors must find new ways of working together. We need to be creative and entrepreneurial, and use Government intervention to 'crowd-in' private sector investment. This way, we will be sure that the future we get is a future we like.

Together, we must jump from to a new growth pathway

Growth and change is cyclical. People, places, and markets all go through similar periods of growth, maturity, and decline – symbolised by the classic S-curve model. The secret of long term growth is innovation: we need to stitch new growth curves together, periodically skipping from one growth pathway to the next to surf a wave of opportunity. That takes a big, bold shift: incremental change can see us double down on decline. Working together, this is the trick we are looking to pull off in Barry.



Together, we must move from silo thinking to network thinking

If innovation is going to be critical to delivery of a transformational approach at Barry, then we need to break out of our traditional organisational 'silos'. We are likely to create the most value at the interface between different areas of expertise, different organisations and across public and private sector. We will therefore be looking to build networks that allow us to see and connect with pools of expertise and investment, whether in the public, private, academic or community sector.

Together, we must move from atomised deliverables to shared missions

We need a way of knitting together the new investments and new approaches in order to make real-world change actually happen. We think that creating a series of shared time-bound 'missions' is the best way to do that. Whilst we will always need to get the right return for our shareholders and customers, we are looking for ways to do that at the same time as creating wins for the local stakeholders and communities we serve.

1884 is talking to us

Taken from the *Barry & District News*
Thursday 15th November 1884

"Do not be afraid of change…so long as what is good and fine in our inheritance is not carelessly cast aside, change there must, perforce, be. If we today in 1884 were to set our face against the bold and imaginative transformations that have been proposed for this community, there would be no great town of Barry in 1984".

What message are we going to send to the people of the 2120s?

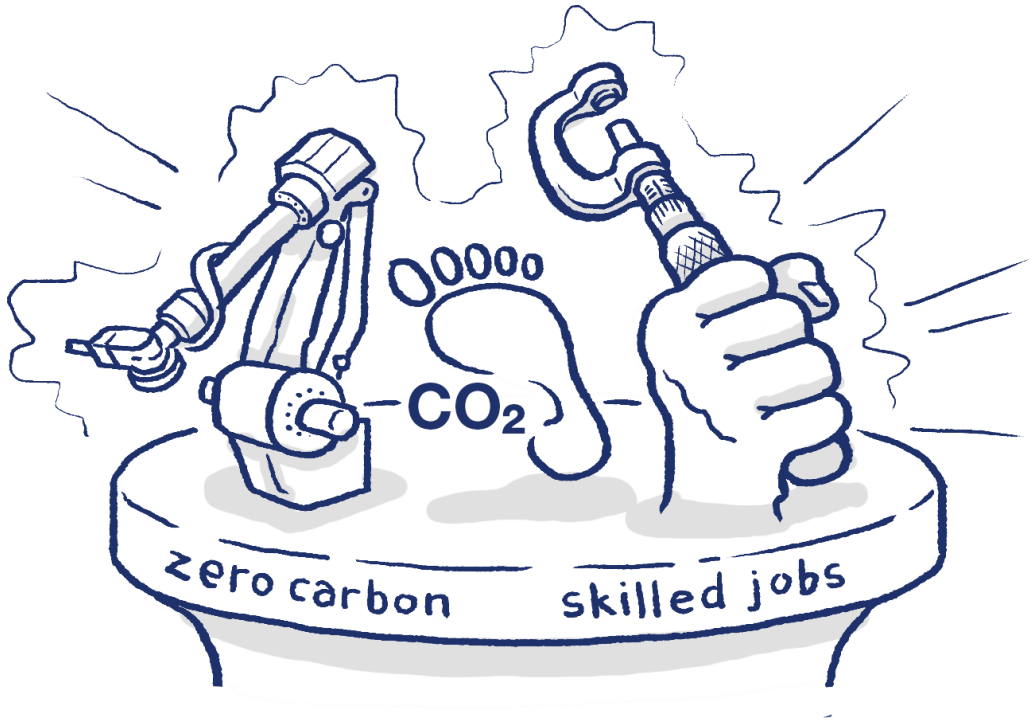
Port construction begins, November 14th 1884. Lord Windsor cut the first sod, followed by David Davies. The Port opened fully in 1889.

Image with thanks to www.valepeoplefirst.org.uk

Part 2 – Vision | Objectives

Vision

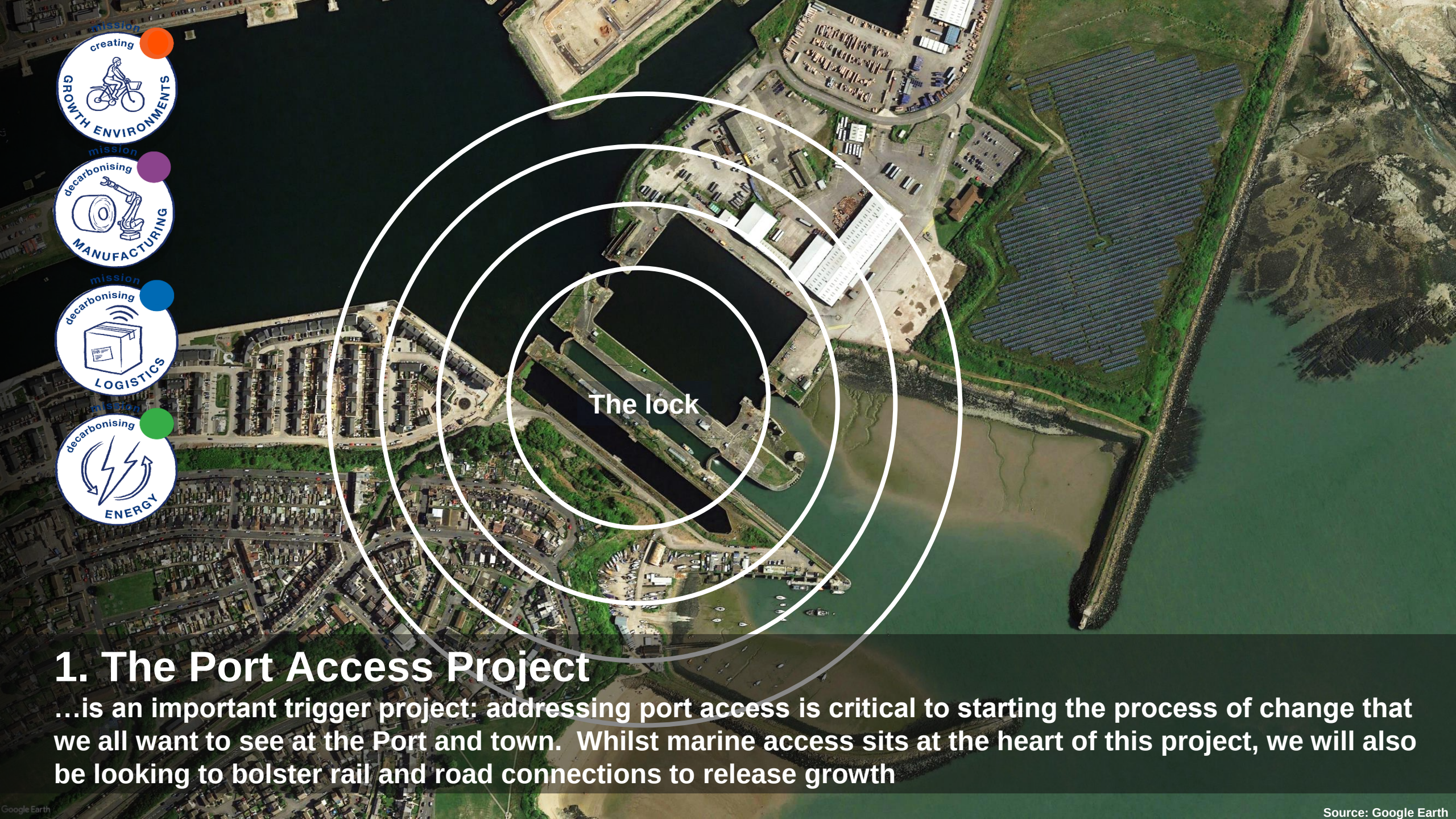
We want to help develop a Port and town made ready for a decarbonising century. We want to spark a virtuous new cycle of Port development, in which each investment propels the next. We see an upgrade in Port access making a new marina development possible, which in turn helps trigger new jobs and businesses at the Mole, helps create new residential communities, and helps provide new community facilities and parkland. We see game-changing zero-carbon industrial developments with impacts that go far beyond the Port and town. And we are looking forward to helping drive the change.



These are the five ‘big moves’ that will deliver this vision

In the following section of this paper, we explain more about each

Source: Google Earth



1. The Port Access Project

…is an important trigger project: addressing port access is critical to starting the process of change that we all want to see at the Port and town. Whilst marine access sits at the heart of this project, we will also be looking to bolster rail and road connections to release growth

Source: Google Earth

The Lady Windsor Lock

At 200m long, the lock is too large for use by the leisure craft which will use the marina. Without lock works, the marina project cannot proceed.

The shared opportunity

We know that this is an unglamorous project that will appeal to few. But port access is one of the weakest links in the Barry 'chain link' system, and without addressing port access, we think it will be impossible to get Barry onto the new growth pathway we are looking for. This is because the Lady Windsor Lock (LWL) is currently both too large, and too small, for the future optimal functioning of the port:

- **The Lady Windsor Lock is too large for the vessels that will use the Marina:** at 200m long, 19.8m wide and around 9m deep, the lock contains around 36,000 tonnes of water in total. A significant proportion of this would need to be shifted each time a small vessel moves from the marina to the sea. This would rapidly empty the Dock, and render the water level too dangerously low for commercial traffic – meaning that it is not possible to run a functioning marina with the lock as it exists now.
- **The Lady Windsor Lock is too small for the next generation of coastal shipping.** The current lock arrangements mean that the largest vessels we can reliably get into No 2 Dock is 10,000dwt. Though we cannot yet be certain, this is likely to be insufficient for the future generation of coastal vessels.

We believe we have an elegant solution. The main elements of the Upgrade Project will insert new intermediate lock gates around a third of the way down the lock, allowing a much lower water loss for small vessels. Impounding pumps will also be installed to allow the replenishment of water levels in the lock. This will be partnered with the renewal of the No. 3 Dock Basin, with dredging works allowing larger vessels reliably in excess of 15,000 DWT (deadweight tonnes) into the port – around a 50% increase. As set out above, over the long term, the basin dredge element may help provide access for the next generation of carbon sequestration coasters (though this is uncertain). This project is by no means sufficient to achieve this objective, though: future projects of this type will need separate public investments. However, it is possible that the project prepares some of the way for these innovations.

The projects are inextricably linked. The LWL will be out of action for nine months whilst the new intermediate lock gates are installed, meaning that the vessels supplying Dow UK will need an alternative route into the Port. The upgraded No. 3 Dock Basin will provide that essential alternative. Without the access provided by the Basin, the lock upgrade project would not be possible.

Alongside the main focus on marine access, we will also be seeking to improve rail and road access to the port.

- **Rail access** is likely to be a key part of the Port's low carbon offer, as well as a way of keeping trucks off local roads. At the moment, the rail service supplies the Dow UK site with silica, a key feedstock. The rail link as aligned now could service Black Rocks and Clean Growth Hub, but is likely to need partial upgrades. We will be looking at the investments necessary to build the offer.
- **Road access** remains important to the Port. We understand that no local junction improvements are imminent, but that the Local Development Plan refresh, due soon, will start to look at how local network capacity and strategic M4 access in the Vale might flex in order to accommodate new development.

Creating the virtuous cycle

This project creates foundational infrastructure for the future of Barry. It creates essential enabling infrastructure for the Marina, positioning the town for the next cycle of change as a residential location. It also creates new growth capacity that can trigger change at Black Rocks and the Clean Growth Hub. The investments we plan allow for the expected development of a new market in the coastal shipping of carbon dioxide to sequestration points, possible (though less likely) hydrogen imports, and servicing for the future speciality chemicals markets.

ABP Ipswich Haven Marina

ABP has considerable experience of running successful marinas around the country. In Ipswich, the marina animates the waterfront and provides a focal point for the town.

2. The Marina project

…is made possible by the Port Access Project. This scheme animates the waterfront, creates new community and business facilities, and creates spin-out benefits that will catalyse Barry's wider regeneration. The Ocean Watersports Trust, currently on the Mole, will be relocated to East Quay

Source: Google Earth

The future marina site today

The Marina will be developed around the Mole – a peninsula created by the original designers of the Port to maximise quayside space. The site is currently largely vacant, with a small area used by the Ocean Watersports Trust (OWT). OWT will be relocated to a tailor-made site at East Quay, allowing the marina project to move forwards.

Port of Barry Marina: initial designs

The Marina creates a new, full facility 400 berth marina on a site at the Mole. A Marina Building (shown in the foreground of this image) will also be provided, with a range of café, restaurant and marina facilities. Note that the external treatment of buildings has yet to be determined. Associated facilities at Junction Cut are not shown here, and Phase 1 will see a 2-3 acre development with a boat hoist, hoist dock, boat storage and boat repair business facilities.

The shared opportunity

This development takes advantage of the Port's strategic situation in the Severn Estuary. Barry has the unique potential for close to round-the-clock access for small craft. The Marina creates a new, full facility 400 berth marina on a 1.5-2ac site at the Mole, with associated facilities at Junction Cut.

The first step is to relocate the Ocean Watersports Trust (OWT) from their current location on the Mole, to a new site at East Quay. OWT are working with Vale of Glamorgan on regeneration funding to create the new premises needed, with ABP support.

We then expect the Marina development proper to proceed in two phases.

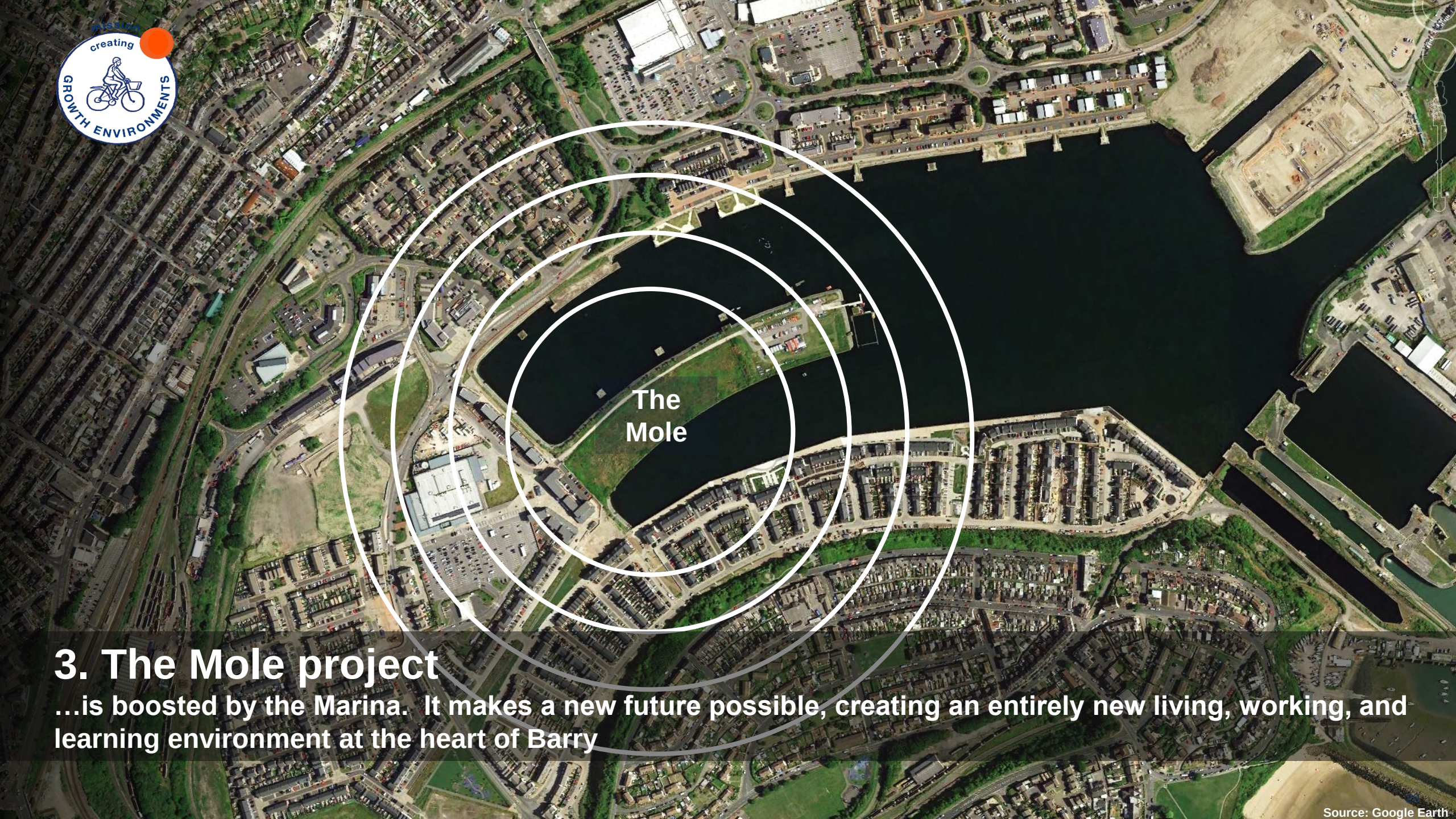
- **Phase 1 happens at two locations: the Mole and the Cut.** At the Mole, phase 1 sees the development of around 225 berths, along with pontoons, piling, storage yard, a marina building, and car parking. This phase will also deliver enabling works at the Mole, including an access road, ground works, utility services and quayside repairs. At Junction Cut (across the water to the east), phase 1 will see associated 2-3 acre development with a boat hoist, hoist dock, boat storage and boat repair business facilities.
- **Phase 2 is triggered when Phase 1 occupancy hits 80%.** This phase would see the development of further berths at the Mole, using the supporting facilities established in phase 1. Projections suggest that this occupancy rate is expected to be achieved in Year 2 to Year 3 of the project.

Creating the virtuous cycle

The marina will have a significant direct jobs impact: work by consultants indicates that similar developments elsewhere have created in the order of 100 jobs (both directly and within the associated supply chain).

But the Marina is more than just a way of creating new jobs – or even a great new community sport and leisure facility. It is perhaps even more valuable in the way it builds wider prosperity. The way that waterfronts create 'magic' has been recognised for over twenty years: in economic terms, the Marina creates the positive externalities that we need. An animated, waterfront location has been proven to be a useful regeneration tool in a number of countries, growing values, development viability and market momentum (URBED, 2001). This is therefore a powerful development tool that will help the development of the Mole and other neighbouring sites, and create an economic lift that will deliver wider benefits.

The Marina will also have a another wider, hard-to-quantify but critically important economic effect. and the marina will reposition and subtly rebrand Barry's offer. The Marina will create the kind of image lift that is hard to value, but centrally important in attracting and retaining the skilled workforces that are critical to future wider prosperity. Barry will not lose its reputation as a good value, family beachside location, but the marina adds new elements – demonstrating that Barry is a great place to visit, a great place to live, and a great place to invest.



3. The Mole project

…is boosted by the Marina. It makes a new future possible, creating an entirely new living, working, and learning environment at the heart of Barry

Source: Google Earth


The business incubator
Plans at the Mole include the creation of a flexible business incubation, training, and event space. Note that the external treatment of buildings has yet to be determined.

The shared opportunity

The Marina development leaves land for development at western side of the Mole. We see a major opportunity for a distinctive new urban quarter for Barry, but one which will integrate well into existing homes and communities. Most likely developed either alongside or soon after the Marina (in order to benefit from the environmental improvements and consequent value uplift created by the Marina), we envisage an improved development package which includes

- **New waterside residential space with a linear park**, with a mix of tenures in a number and proportion to be determined by site viability and negotiation. And with a distance of around 600m from the Mole to Barry station as the crow flies, and a short commute time to jobs on the Mole, in Barry and in Cardiff, this counts as Transport Oriented Development (TOD) which helps cut unsustainable commuting and minimises loads on local road infrastructure.
- **A flexible business incubation, training, and event space**. Industry standard job density guidelines suggest that this facility could accommodate 200 jobs – although the provision of the shared space that is critical to the offer may see that number fall a little. Subject to receipt of funding, the incubator will be delivered for the Council by ABP, and we are building relationships with the Vale of Glamorgan, the College, and innovative incubator operators in order to bring this site forward. The model we are exploring stresses flexibility, providing innovative workspace for new micro businesses, with move-on space for businesses as they grow. These buildings can be made to work very hard, also providing evening event space and accommodation for students on courses at Cardiff and Vale College (CVC), and also being strategically positioned near to the proposed new CVC site immediately south of the Goodsheds.

The overall approach is to build on the new direction that Barry established at the Goodshed and Pump House, creating a modern, innovative offer for the town, and providing a focus for aligning young peoples' skills to the new opportunities located at the business incubator.

Creating the virtuous cycle

This project creates important direct and spin-out benefits for Barry.

The linear park and public walkways create a shared community resource that reconnects the people of Barry to their waterfront.

The incubator facility reinforces this offer. It creates new employment space that will help Barry shift to a new, post-Covid economy – as well as reducing the need for commutes into Cardiff. Office occupation patterns are shifting from the fixed, long-lease model typical before Covid; the Incubator will create a collaborative working environment suitable for a 'hybrid' office/home working future. There will be an emphasis on creating the shared services and facilities that can grow an innovative business ecosystem for Barry, and is one that could prove very influential if partnered with College provision and apprenticeship programmes. The project will reinforce Barry's status as an employment location, balancing Barry's offer as a place to work as well as live.

The creation of a new residential community helps complete the strategic shift that Barry has made over the last decade, and brings much-needed new housing development to a sustainable, transport-connected central urban location.

Case study: Cardiff Tramshed

Tramshed Tech developed the Cardiff Tramshed, and could be useful partners in bringing forward any future incubator provision at the Mole, subject to a competitive process.

Tramshed Tech report that experience of building Cardiff's Tramshed Tech #1 has enabled the development of a commercial model for a co-working innovation space and tech/digital/creative sector office units, where meet-ups, meetings and events can be delivered alongside high-level digital skills training. Tramshed report they have witnessed the increasing demand for co-working in collaborative innovation spaces, where people can come together on a regular basis to discuss ideas, make introductions to like-minded people and to potential project partners, develop ideas into products and services and grow and scale companies. Provision is very well aligned to a post-Covid hybrid working.

Tramshed Tech differentiate themselves from other co-working spaces which only provide a space offer by providing a wide range of industry and business growth services. In Cardiff, the site offers space and some financial support for local community groups and organisations including the Grangetown Business Forum, the local Hindu temple, Grange Pavilions and the Jason Mohamed Academy for disadvantaged young people, provided in partnership with Cardiff and Vale College. In Barry, Tramshed #1, Tramshed would also provide a range of dedicated support for the local community.

Tramshed Tech is run as a commercial model on a revenue-driven basis: Tramshed's growth has been built upon market demand, not market failure. However, capex and early-stage revenue costs would need to be supported until the commercial revenue-driven model (based on commercial rents and charged services) can be achieved. Tramshed anticipate moving into a subsidy-free position within the first three years (as a comparator, it took 2 years for Tramshed Tech #1 to move from deficit to a break-even and then revenue-positive profit position). As Tramshed's brand and market position has been established, revenue at the Cardiff site has quadrupled in the past four years.

4. The Black Rocks Growth Zone

…benefits from the new investment environment. Black Rocks will be a major strategic asset for Wales, with all the components needed for success in a decarbonising economy. We are putting together a blend of two classic technologies – rail and sea access – with three new technologies that move us towards our net zero targets: green energy, carbon capture and hydrogen availability. These are set to become key determinants of industrial location choices in a decarbonising world, creating a new strategic advantage

Source: Google Earth

The Black Rocks Growth Zone

The Zone provides a range of assets in a unique combination that will interest investors looking to make a strategic move towards decarbonising manufacturing processes. The precise site layout will be tailored towards the needs of the end user.

Direct access to rail

The Zone brings together rail and quayside access

The shared opportunity

The site makes an unusually rich offer, combining available land, quayside access for 15,000 to 20,000 dwt vessels, direct access to rail and container handling facilities, and direct access to behind-the-wire zero carbon energy from a PV array.

This creates a range of possibilities including battery supply chain, advanced manufacturing, rare earth mineral processing, and next generation biofuel manufacturing. We are working with Welsh Government and BEIS on identifying the next generation of investors ready to take the site forward.

The precise layout of the site is hard to predict: the best way forward is to build the site to suit the needs of incoming investors. However, at this stage, we envisage breaking the site into four plots of between 5ha to 6ha each, with each plot seeing built development of 25,000 to 30,000 sq m and accommodating between 100 to 300 jobs onsite, depending on end use. An alternative that we are exploring sees around 24 acres of additional PV in a northern extension to the existing solar array. Over the longer term, and as demand develops, we expect that it will also play a role in futureproofing around 600 jobs at Dow UK through provision of carbon sequestration facilities, possibly via the adjacent Navigator Terminal. There may also be scope to extend the existing PV array onto part of the site.

- **Workstream 1: site preparation.** ABP is already running a significant site clearance programme, and has spent £2m on site clearance and ground works through 2021/22. We will need to drive this initial programme forward, and bring the site up to a 'ready-to-go' status.
- **Workstream 2: flood remediation.** the site is largely defended from marine flooding although the TAN15 flood map suggests that some areas of the site will be subject to tidal flooding in the 1 in 200 year flood in 100 years' time. Policy interpretations around TAN15 exemptions on port PD rights are being reviewed.
- **Workstream 3: road and rail upgrades.** We may need to move Atlantic Way to the eastern boundary of the site. This would allow us to create the unconstrained access to the quayside that investors are likely to need, and also avoid workplace safety issues. We will also be looking carefully at any necessary rail system upgrades to the existing tracks.
- **Workstream 4: Site assembly.** The Wimborne Buildings are coming to the end of their design lives. Over time, there may be requirement to find new facilities for tenants, and demolition will allow their replacement with more energy efficient, up-to-date facilities designed to suit incoming investors. The exact timing of this process will depend on how investor demand builds, and we expect to be able to develop this part of the site last.
- **Workstream 5: energy generation.** Local behind-the-meter generation will be an important part of the site's USP, so we envisage integrating PV generation into the site, with both rooftop and ground-mounted arrays. Array sizing and locations depend on customer demand, and the locations and building types associated with meeting that demand.

Creating the virtuous cycle

The Black Rocks project is the potential opening move in creating a new industrial growth pathway for the Vale's manufacturing sector – both at the Port, and beyond. This is the way that Barry will stake its claim to a future in high productivity zero-carbon manufacturing.

On its own, this is potentially exciting 40-60 acre strategic development site that combines a range of advantages. But the way that this site prepares the way for the larger (110 acre) Clean Growth Hub site is possibly even more important. When seen together, these two sites will create a strategically located manufacturing complex big enough to develop new capabilities, with shared facilities such as the existing at-scale grid connections, shared heat systems, alongside possible future CO2 liquefaction and hydrogen electrolysis facilities. Targeted at major inward investors, the site will be suitable for activities including speciality chemicals, ceramics, advanced materials, and a future Bro Tathan supply chain, possibly including a future Gigafactory that we know the Welsh Govt is keen to see at the site.

We will continue to work with the South Wales Industrial Cluster (SWIC) project as these concepts develop.

5. The Port Clean Growth Hub

…is boosted by the Port Access Project and Black Rocks. Knitting together South Wales' wider clean growth plans, the Port's Clean Growth Hub is a potential game-changer for Barry – and Wales. Building on Barry's existing chemical sector expertise, this will be a strategic 120 acre site primed for the next cycle of manufacturing innovation, combining access to sea, rail, a major grid connection, PV generation, future hydrogen supplies and the port's proposed Carbon Capture, Utilisation & Storage (CCUS) facilities

Source: Google Earth

The Port Clean Growth Hub

The Hub will work alongside Barry's existing strategic employment assets at Dow, and contribute to the future decarbonisation of manufacturing in Wales.

Direct access to CCUS

The Port Clean Growth Hub and the Black Rocks Growth Zone could both benefit from proposed Carbon Capture Utilisation and Storage (CCUS) facilities offered via the Port.

The shared opportunity

The Clean Growth Hub is a 110 acre zero carbon manufacturing hub site of UK significance. The investment is already seeded: there is an existing chemicals cluster in place, including key manufacturers at Dow UK, Cabot Carbon and Bakelite. But the growth dynamic needs to be re-established. Our aim is to rebuild site activity levels to the more intense uses seen in the 1970s, but with a focus on zero or low carbon manufacturing rather than petrochemicals. The concept is to grow out from the existing core of expertise, building on the momentum created by i) new marine capacity through the Port Access Project and ii) the market confidence created by the development of the Black Rocks site, and iii) the growing imperative to decarbonise manufacturing operations in readiness for the carbon charges which are expected to be introduced to stimulate the move to net zero.

Water access is likely to remain a key advantage for the site. The site is within 1km of the Navigator Terminal berth at No 2. Dock, and this means that the site has access to imported feedstocks. This also allows the development of future CCUS facilities and, depending on viability, possible hydrogen import facilities. The site enjoys rail access via the Container Terminal and a major grid connection via the historic Centrica CCGT site (which had 240MW export at the time of power station operation).

We expect the Clean Growth Hub to develop in a number of workstreams, which may run concurrently.

- **Workstream 1: establishing strategic property control and the right permissions**. Whilst ABP is the freehold landowner at the Sully Moors Road site, over the years the site has been subject to a series of sub-leases and tenancies. This fractured control has meant that coherent development strategies such as the one set out here have not been possible before now. We are working to resolve this complexity, in preparation for major developments that can set us on a new growth pathway.
- **Workstream 2: site preparation.** Subject to future commercial deals, we will clear building remnants, take out foundation slabs and level the site. We will seek to minimise waste by crushing concrete on site and re-using it as construction fill. Where we have good visibility on future requirements, we will establish services and road access.
- **Workstream 3: planning, permitting and flood remediation.** At the Clean Growth Hub, the issue is fluvial (river) flooding rather than inundation from the sea: parts of the site are subject to flooding from Sully Beck and the Cadoxton river, particularly at high tides. We need to work with partners on the changing implications of TAN15 flood policy, but early analysis suggests that there are some relatively straightforward flood remediation projects such as clearing the Sully Beck outfall, and that we may need a more extensive programme of flood works aimed at storing flood waters behind a series of swales. This may require some land acquisition. We hope to be able to create a set of win-win solutions that can create wetland flood storage areas along with a carbon sink function that will both improve biodiversity whilst maintaining our ability to help decarbonise Welsh industry. There may also be an opportunity to redirect the Cadoxton river into the Dock, making a dock feeder that would reduce (but not entirely replace) the need for impoundment. We look forward to working with Natural Resources Wales, the Vale of Glamorgan, and other partners in order to develop these concepts. Where necessary, we will work with the Vale on the necessary permissions to make future change.

The shared opportunity (cont)

Workstream 4: energy generation. One of the key selling points for the site is the proximity of 'behind the meter' energy connections that provide zero carbon electricity to our tenants for a proportion of their consumption. We envisage a significant increase in energy demand, both from ABP and our customers, so we expect to be able to expand the generation of renewable energy at the port. The Port already has a successful (4.5 MW) PV array, and we are currently looking at how we can extend energy production across the Black Rocks site, the Port Clean Growth Hub, and even the surrounding area - although the exact quantum and location of PV is to be determined. Solar power produced is likely to be used by on-site energy off takers and a hydrogen electrolyser which will produce green hydrogen. Our current high level thinking suggests that the electrolyser could be best located between the Dow and Cabot sites. The PV energy offer could be supplemented with a low carbon 12 MW baseload energy from the Biomass 2 Power plant, assuming it gains regulatory approval in future.

As ever, these actions depend on us getting the right balance of risk and return, both for our shareholders and the local community. But there is clearly a very significant shared opportunity here.

Creating the virtuous cycle

This site creates the possibly of a clean, low carbon manufacturing renaissance for Wales. When this project is complete, Barry would have a significant competitive advantage over a range of European and global industrial locations: access to development land, green power, hydrogen, and carbon sequestration facilities at a rail-linked site. Together, this project is expected to be one of the strategic sites that Wales can use to help deliver the ten points of the Manufacturing Strategy for Wales and the wider strategy of the South Wales Industrial Cluster (SWIC).

Case study: the SWIC Clean Growth Hub concept

Industrial geography is due to change over coming years, as access to low carbon energy, feedstocks and carbon sequestration becomes a key determinant of industrial location choices following the future adoption of carbon pricing. The Port of Barry could play a key role.

The Clean Growth Hub concept developed by SWIC and CRPlus anticipates this process of change. It has been advanced as a way of co-locating future zero carbon industries to create efficient access to future decarbonisation technologies such as energy provision and storage, emissions capture, and the re-use of by-products such as waste heat and chemicals to help create a 'circular economy'. Heavy energy users or carbon emitters such as chemicals, ceramics, or cement sectors would be early targets.

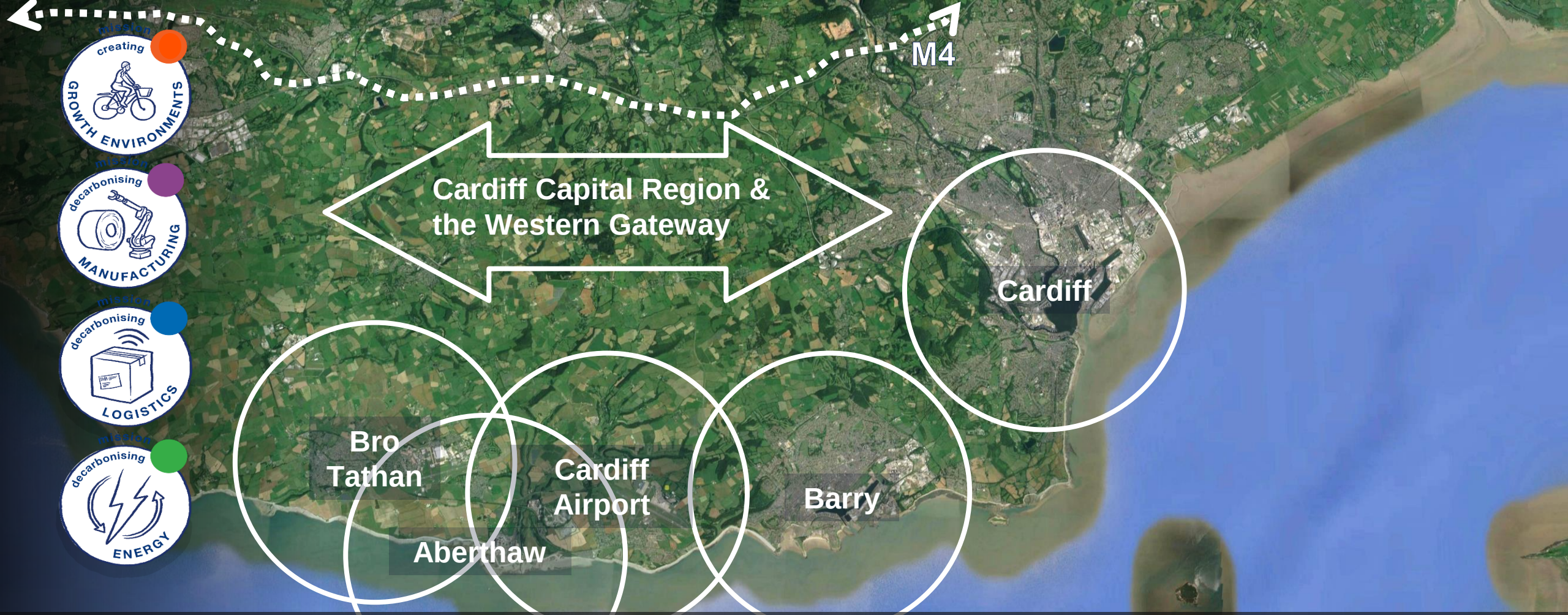
Early concept work suggests that Barry could be a useful location for this type of development. The concept suggests that buildout from an anchor user, or anchor energy generator, is an important feature. Dow UK provides part of the anchor tenant function, but there is scope to add incoming inward investors. In many ways, the concept is a return to the integrated 'chemplex' concept of the 1960s and 1970s which was in place at Barry before BP's exit, which used a shared service model based around a central power station and steam distribution network.

The future 'Clean Growth Hub' concept at Barry could bring together on-site PV energy generation, blue and green hydrogen production, Carbon Capture and Storage facilities via the port, shared waste heat and hydrogen networks, and even vertical farming.

However, concepts remain at an early stage. And, like the other elements of this vision paper, we have a 'systems' problem to solve: we currently have a chain-link system which is operating sub-optimally. At the moment, there is no overarching strategic actor with the deep domain knowledge that can create the Hub we need.

As the leasehold picture evolves, it is clear that irrespective of operational control, the creation of the integrated offer we are looking for may need a single leaseholder able to take a long-term, strategic view of market development, along with significant public sector seedcorn funding. Together, this would allow us to transition the site into a cycle of positive change.

Dow UK and the Port of Barry



Creating a wider growth environment

We know that creating sustainable growth is about much more than the Port. The Port works within the wider context of the Vale, the Cardiff City Region, Wales, and the Western Gateway. The opportunities are remarkable - and whilst ABP wants to make major investments, we cannot invest alone. We will succeed if we work together with our customers, communities, the wider private sector and Government at all levels

Source: Google Earth

A wider growth environment

A range of partners will need to work together if we are to deliver lasting change in Barry.

Reinforcing change: creating a growth environment in and around the port

One of the central themes of the 'system thinking' approach we have used in this vision paper is that the Port, town, community, employment market, business and natural environments are all connected. Finding and working on those connections is central to our thinking.

We are excited by the possibilities opening up. We are working with Vale of Glamorgan Council on bidding for regeneration funding, and looking at an innovative new approach to its Investment Fund. The Welsh Government is exploring new funding streams for port infrastructure, site development and marine energy. And there is substantial funding available for regeneration, decarbonization and inward investment support from central Government. To this picture, ABP brings patient, long term investors. Just like Government, ABP is constrained in its investments by what is financially possible at certain times and in specific places. But we do know that our investors are looking for good quality projects which give stable returns at the right rate.

We now need to create a new partnership that can convert these funding streams to real opportunities. We want to look at how we:

- **Align this vision work** with some of the regeneration thinking undertaken by the Vale. One notable aspect is the idea of a circular walk around No1 Dock. This would be an asset for Barry, and would require a road/ cycle/ pedestrian swing bridge over The Cut, and pathways over the main lock – also having the benefit of connecting the Wales Coastal Path. These links would also have labour market benefits. We note that initial costings for the necessary swing bridges are high, and that we also need to comply with International Ship and Port Facility Security (ISPS) Codes which require us to maintain a secure perimeter for port activity. However, we will participate positively in these discussions as they develop.
- **Develop a set of short, medium and long term objectives together** - both directly on port innovation, and more indirectly on wider development opportunities.
- **Integrate the Port into the wider economic geography.** The Port becomes a key building block in the wider South Wales offer to the new clean industries of the twenty-first century, providing a gateway to the nationally significant development sites at Bro Tathan (1,200 acres), Cardiff Airport (500 acres) and Aberthaw project (500 acres). The plans we are presenting here align perfectly with this wider context.
- **Ensure that we create the capacity that will release growth** – particularly around strategic transport links to the M4, which currently constrain our ability to attract new port customers. Smaller, local scale projects will also be useful in creating traffic capacity at specific bottlenecks.
- **Keep working with the local community,** for example with the Ocean Watersports Trust, Pride in Barry, FocusBarry, and the Barry Yacht Club.
- **Create the policy flexibility** and fast track consenting needed to harness innovation.
- **Bring in new marine occupiers and academic institutions,** possibly including Cardiff and Vale College and research centres from Wales' academic institutions, including with Cardiff and Vale College on their innovative plans for a new site immediately south of the Goodsheds.
- **Develop joint investment and funding structures** that allow us to work together on some of the really big changes Barry needs.

Case study: how the Port can help the strategic growth opportunity in VoG

A range of strategic economic development options are emerging in the Vale of Glamorgan area that could substantially reposition this part of South Wales, and the Port of Barry could play an important role.

Bro Tathan is around 11 kilometres from the Port of Barry. Bro Tathan is an 1,200 acre ex-MoD site being marketed for strategic industrial uses, and is currently home to Aston Martin manufacturing facilities. The site was recently announced as the proposed location for the development of the new BritVolt gigafactory facility until the investment was relocated to Teesside - but great potential remains.

From Bro Tathan, it is around 2km to the ex-RWE power station site at Aberthaw. This site has been recently purchased by Cardiff City region. As an ex-power station site, Aberthaw has very substantial grid connection capacity, and could therefore be a key grid connection point for

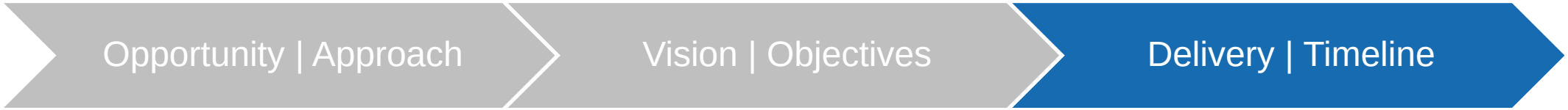
- **FLOW (floating offshore wind) turbines from the Celtic sea.** An Aberthaw connection could be a useful way of sidestepping the substation planning issues that have held up the development of landing points for wind farms in the Southern North Sea; and the
- **proposed Severn Estuary tidal barrage**, which could generate up to 7% of the UK's energy needs, depending on chosen routes and technology. A detailed engineering study into the tidal barrage opportunity has recently been announced, with an Aberthaw to Minehead barrage option being a leading contender. This initiative is backed by significant funding from the Welsh Government's Marine Energy Programme, which remains at budget discussion stage but is understood to be of the order of £100m, with ringfenced allocations for FLOW and a tidal marine challenge.

The Port of Barry could function as a critical gateway to these developments, forming part of a marine or rail supply chain for future development at Bro Tathan and Aberthaw (rail links run between the Port of Barry and the Aberthaw site). The Port's proximity to possible future tidal barrage developments could also make it an important part of the construction process for what could be a £30 billion project.

Connecting local strategic assets

The Bro Tathan site is in the foreground, whilst the ex-RWE Aberthaw power station site is nearby. Barry is visible on the coast towards the top of this image.

Part 3 – Delivery | Timeline



Delivery | Timeline

Here, we set out the changes we intend to deliver. We know that timelines will flex, some projects will change, and new projects may come into the plan, but – depending on resource availability and wider carbon policy shifts - we aim to make some big moves inside the next five years, and have the process substantially completed by 2035.

Delivery: Barry 2035 - the optimal scenario

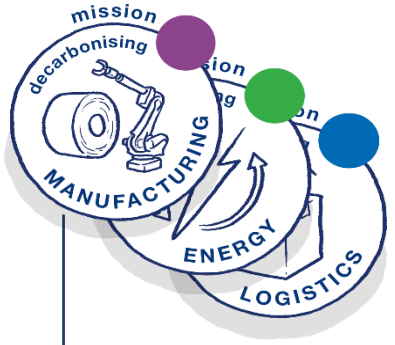
Exact delivery dates depend on viability and funding

Timeline for Growth to 2035

All timings are approximate and subject to project viability

Funding bids
Levelling Up Fund, Shared Prosperity Fund (tbc) and ongoing opportunities

Marina
Assumed start 2022, subject to grant funding. Permitting and consenting 2022/3, opening 2024



Black Rocks
Selective site clearance and demolition started 2022, with energy study, outline planning application (under v1 TAN15 rules) possible 2022/3 if not PD. Public sector support likely needed, rolling delivery in line with customer requirements. Full vision delivery dependant on wider UK policy change, which is of uncertain timing.

Now

2025

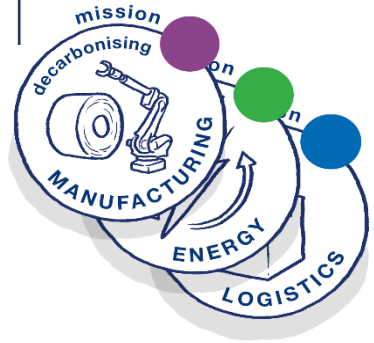
2030

2035

Port Access Project
Assumed start 2022, subject to grant funding. Marine consenting & scheme design, procurement & construction through 2023

Ocean Watersports Trust relocation
East Quay homes and waterside park development
Via housing consortium through 2022/3

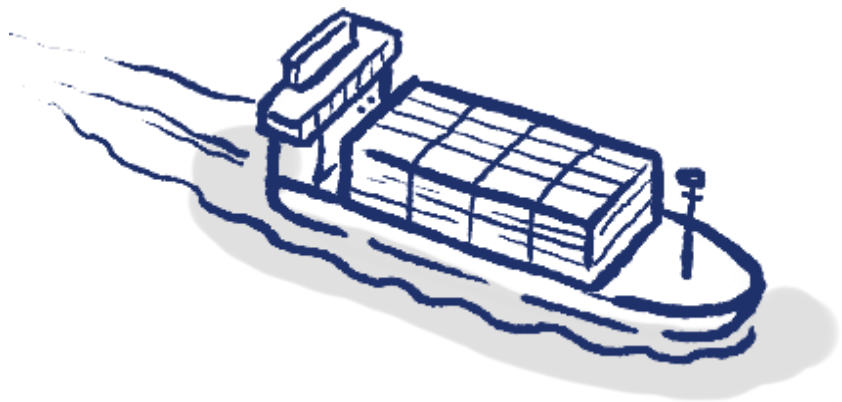
Mole development
Assumed start 2022, subject to grant funding. Outline/hybrid detailed planning application 2022/3, construction through 2023/4, first sale and incubator opening 2024



Clean Growth Hub
Lease and land title work through 2022/3. Flood study and possible flood mitigation land acquisition. Possible need for ongoing development work possibly through SWIC, with public sector support for any major decarbonisation investments. Rolling delivery in line with customer requirements. Full vision delivery dependant on wider UK policy change, which is of uncertain timing.

What do you think?

The best visions evolve and adapt: we present this paper as a work in progress which is intended to start an ongoing conversation. We welcome your comments, ideas and improvements. Please get in touch via email at WalesVision@abports.co.uk



ASSOCIATED BRITISH PORTS