

Maximising the Marine Economy of the Highlands & Islands

COHI – Orkney – 4th March 2019

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Highlands and Islands Enterprise
Iomairt na Gàidhealtachd 's nan Eilean

1. The Marine Economy

2. The Science & Innovation Audit

- Background
- Findings
- Next steps

3. Future investment opportunities

4. Current Actions and Vision for next 10 years

Blue/Marine Economy Sectors



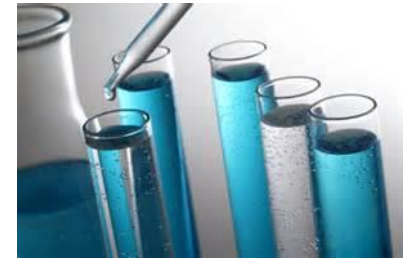
*Blue Growth
Energy (wind, wave, tide)*



*Blue Growth
Seabed Mining*



*Blue Growth
Aquaculture*



*Blue Growth
Biotechnology*



*Blue Economy
Tourism*



*Blue Economy
Shipping (shipbuilding, transport)*



*Blue Economy
Oil and Gas*



*Blue Economy
Fisheries*

Sector Lifecycles

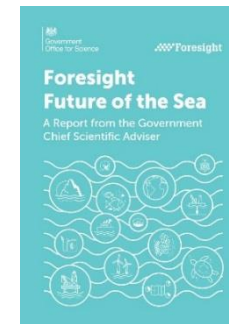
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|-------------------------------|------------|-----|-------------------|------------------|-----------|---------------|--------|-------------|--------------|
| Aquaculture | Blue Skies | R&D | Prototype testing | First commercial | Expansion | Consolidation | Mature | Post Mature | Decommission |
| Offshore Wind | Blue Skies | R&D | Prototype testing | First commercial | Expansion | Consolidation | Mature | Post Mature | Decommission |
| Wave & Tide | Blue Skies | R&D | Prototype testing | First commercial | Expansion | Consolidation | Mature | Post Mature | Decommission |
| Deep sea mining | Blue Skies | R&D | Prototype testing | First commercial | Expansion | Consolidation | Mature | Post Mature | Decommission |
| Biotech | Blue Skies | R&D | Prototype testing | First commercial | Expansion | Consolidation | Mature | Post Mature | Decommission |
| Offshore Oil & Gas | Blue Skies | R&D | Prototype testing | First commercial | Expansion | Consolidation | Mature | Post Mature | Decommission |

The Marine Economy in context

➤ EU: The Ocean Economy in 2030



➤ UK: Foresight Future of the Sea Report



➤ Scotland: An Analysis of the Maritime Sector in Scotland



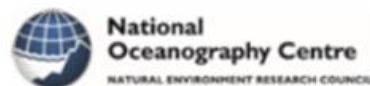
➤ H & I: Maximising the Marine Economy of the Highlands And Islands (MAXiMAR)



The rationale for SIAs:

1. Add to the evidence base that describes the UK's science and innovation excellence and its link to productivity, thereby helping to inform the Industrial Strategy and other central government policy
2. Help local actors understand their own strengths, weaknesses and opportunities, strengthening bids for future assessment and strategic planning
3. Increase collaboration between businesses, universities and local government

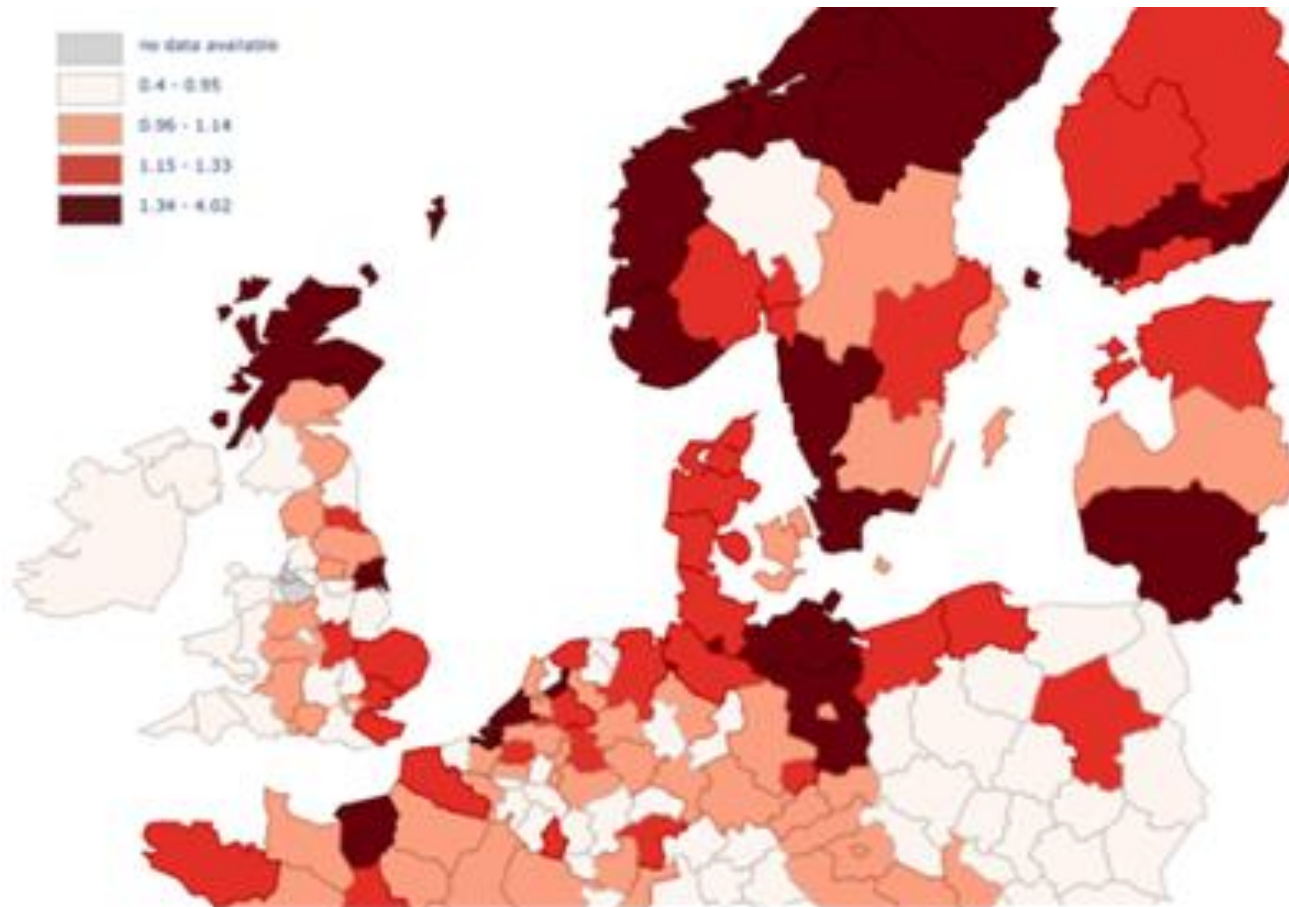
Science & Innovation Audit Consortium



SIA Process:

- July to November 2016 – consultations and workshop
- December 2016 – first Consortium Meeting
- January 2017 – submission of EOI
- November 2017 – confirmation of SIA to proceed
- December 2017 – June 2018 – completion of Audit (Report submitted 29 June 2018)
- Current – awaiting formal publication by UK Govt

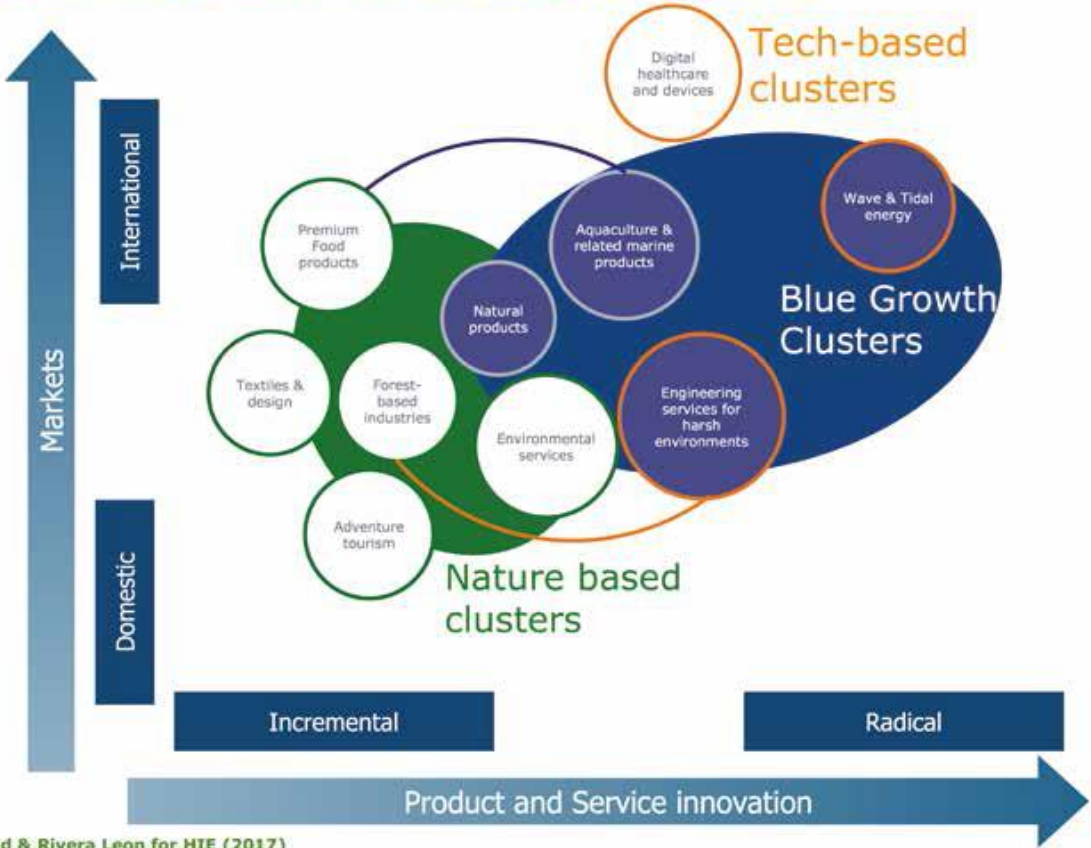
Focus areas



Source: European Cluster Observatory, extracted April 2016, specialisation over 1 indicates a relative specialisation compared to EU average – Blue Growth

Cluster Specialisation

Highlands & Islands Strategic Clusters



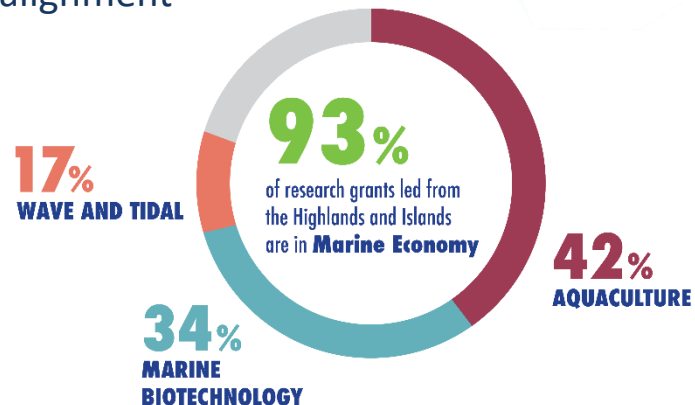
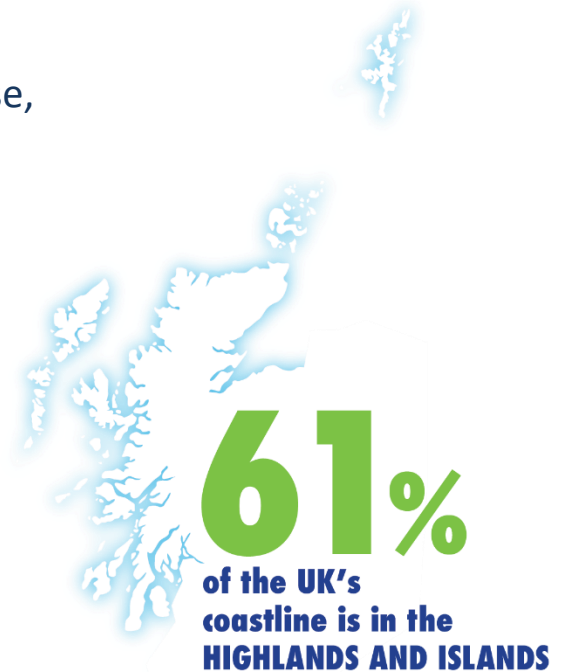
SIA Findings: The Potential

- Potential to grow seven-fold in value by 2035
 - Aquaculture: £3.6bn by 2030 (H&I)
 - Wave and tidal energy: £800m by 2035 (UK)
 - Marine biotechnology: £600m by 2030 (H&I)
- Drivers of change:
 - Digital technology, robotics, and automation
 - Increasing demand for fish protein
 - Clean energy
 - Marine biotechnology applications in health and life sciences, food, energy, and other high value applications
- Opportunities and challenges are global and so to realise the potential, our responses must be global

Aquaculture contributes
£1.8bn
per annum to the UK economy
the majority
£1.4bn
is within the Scottish economy

SIA Findings: Assets

- Strengths lie in the combination of natural assets, people, enterprise, and research expertise and facilities
- The natural marine environment is a high quality, abundant and under-used resource
- Significant science and innovation assets across education, the public sector, industry bodies, research centres and private companies
- Private sector innovation and involvement in science – though more scope for research and industry alignment
- Existing examples of, and more potential for, cross-sector clustering and synergies

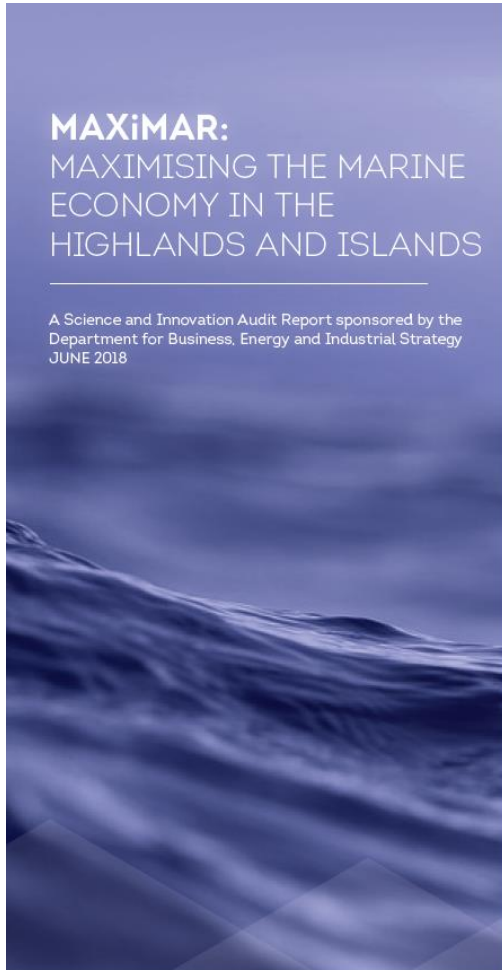


SIA Findings: The Challenges



- Skills is a key challenge, and skills needs are changing rapidly with technology
- Talent retention and attraction in H&I – the region loses around 2,500 young people every year
- Focus must be on Scotland’s reputation and position as a quality producer
- Complex and changing funding landscape, and access to finance
- Gaps in physical infrastructure to support scientific research, test and demonstration
- Commercialisation of innovations and access to markets, especially for marine biotechnology and wave and tidal energy
- Planning and regulation processes can inhibit innovation and growth

Cluster Specialisation proven



- Strong evidence base of H & I specialisation – strengths in science and innovation – 93% of research grants led in the region are in the marine economy
- Growing number of blue growth businesses actively innovating in region (56% vs 52% in Scotland in 2015)
- Confirmed **uniqueness of place** – physically, biologically and innovatively
- However, also found, current degree of education, skills, research provision and test & demonstration capabilities not enough to fully maximise the opportunities afforded by marine
- Set of actions

Science & Innovation Audit Themes

- 1 Edinburgh and South East Scotland City Region**
Digital technology and Data-Driven Innovation
- 2 Sheffield City Region and Lancashire**
High value manufacturing
- 3 Greater Manchester and East Cheshire**
Health Innovation and Advanced Materials
- 4 Midlands Engine**
Advanced Manufacturing; Digital Technologies and Data; and Systems Integration
- 5 South West England and South East Wales**
Advanced Engineering and Digital Innovation
- 6 Enabling Technologies in Scotland's Central Belt**
High value manufacturing
- 7 Bioeconomy of the North of England**
Agri-tech and industrial biotechnology
- 8 East of England**
Life sciences and agri-tech
- 9 Innovation South**
Digital enabling technologies
- 10 Leeds City Region**
Medical technology
- 11 Liverpool City Region+**
Infection; Materials Chemistry; and High Performance Computing
- 12 OffShore Renewable Energy**
Offshore energy and sustainable ocean technologies
- 13 Oxfordshire Transformative Technologies**
Quantum computers; autonomous vehicles; digital health; and space and satellites
- 14 Cyber Resilience Alliance**
Cybersecurity
- 15 Maximising the Marine Economy of the Highlands & Islands**
Aquaculture, wave and tidal energy and marine biotechnology
- 16 North West Nuclear Arc Consortium**
New nuclear technology
- 17 North West Coastal Arc Eco-Innovation Partnership**
Low carbon energy and eco-innovation
- 18 Northern Powerhouse Chemicals and Processing Science**
Chemicals
- 19 Northern Powerhouse in Health Research**
Medical
- 20 The South Wales Crucible**
Steel innovation; smart manufacturing; health informatics; and agri-tech
- 21 Upstream Space**
Space infrastructure and technology
- 22 Precision Medicine Innovation in Scotland**
Precision medicine
- 23 Applied Digital Technologies**
Digital capability
- 24 Sustainable Airports**
- 25 The Knowledge Quarter**
Biomedical; heritage; digital publishing; and data science

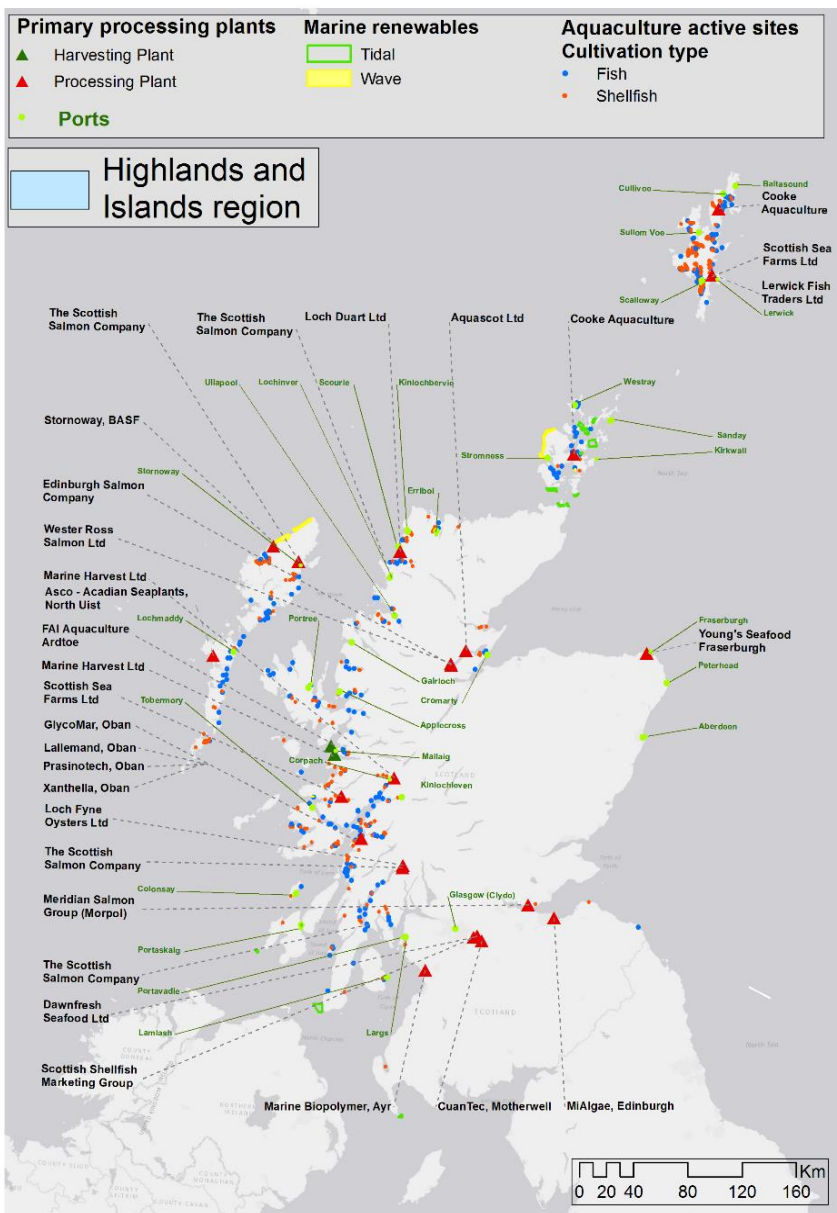


'Science and Innovation Audits help local organisations map their research and innovation strengths, and identify areas of potential global competitive advantage.'

SIA – 4 Targeted Opportunities

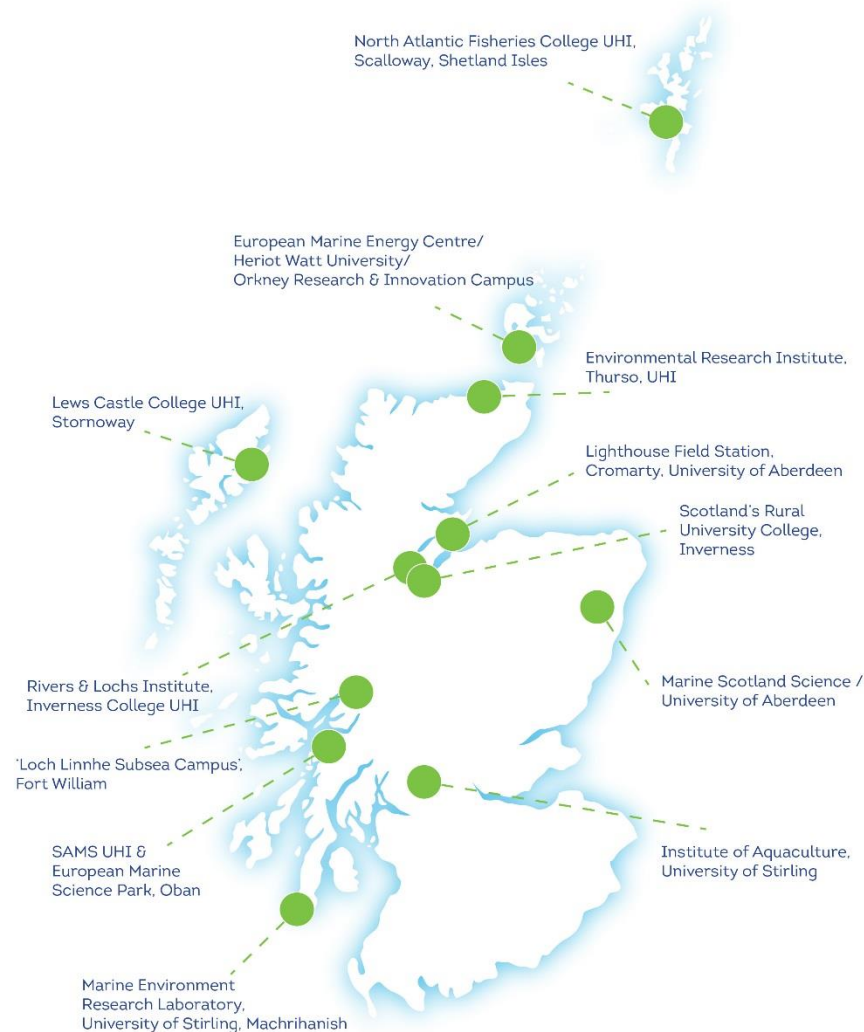
1. Create a regional cluster model for marine innovation, technology & skills through:
 - A. Workforce development
 - B. A Marine economy innovation infrastructure plan
 - C. Scaling and alignment of science, regional and industry
2. Address challenges associated with routes to market – identifying new markets; new technologies
3. Refresh and challenge the current planning & regulation framework
4. Develop a regional marine economy prospectus

Marine Technology & Innovation Cluster



- 61% of UK Coastline
- 188 Marine Energy companies
- 92 Aquaculture companies
- 22 Marine biotechnology
- 16 education and research providers
- 5 NRIP Sites; major port developments; Ultra Deep-water Decomm site
- Marine Tourism, Fisheries, Decommissioning

Marine Technology & Innovation Assets



- NAFC UHI, Shetland
- EMEC, HWU
- IC, UHI (Rivers & Lochs)
- ERI UHI
- 'Loch Linnhe Subsea Campus'
- SAMS UHI, EMSP
- MERL

NATIONAL Underwater Innovation 'Hub'



- EMEC
- National Decom Centre
- JFD Nat Hyperbaric Centre
- Balmoral Subsea Test Centre
- Loch Linnhe Subsea Campus
- SAMS
- MOD Faslane
- Edin Centre for Robotics
- TUV SUB NEL
- OGTC
- Subsea Centre of Excellence
- Baker Hughes GE CoE
- National Renewable Energy Centre
- Tyne Subsea Neptune Centre
- Underwater Archaeology Centre
- National Oceanography Centre

Future Investment Opportunities

- Funding opportunities in the H & I:
 - Orkney Renewables Innovation Campus - £6.5m approved investment
 - Marine Bio-processing Centre, extension to the European Marine Science park
 - Phase 2 Funding approved
 - Marine Environment Research Laboratory, Macrihanish – as part of University of Stirling International Centre of Excellence/Stirling & Clacks CRD
 - Islands Growth Deal - proposals under development
 - Argyll Growth Deal - proposals under development
 - Marine Training Facility at EMSP – under development
 - Aquaculture Acceleration Innovation Funding (HIE)

- Alignment with national infrastructure – NMIS; BAYES; Innovation Centres

- EU research funding; Shared Prosperity Fund; International funds

- UK Industrial Strategy/UKRI funding calls - **Strength in Places Fund** →

Strength in Places Fund

- New fund launched at the end of May 2018 - high level aims of the Strength in Places Fund are:
 - To support innovation-led relative regional growth by identifying and supporting areas of R&D strengths that are:
 - driving clusters of businesses across a range of sizes that have potential to innovate, or to adopt new technologies;
 - in order that those clusters will become nationally and internationally competitive.
 - To enhance local collaborations involving research and innovation. Building on the underpinning regional economic impact role of universities, research institutes, Catapults and other R&D facilities (such as Innovation and Knowledge Centres - IKCs); and engaging those businesses at the forefront of delivering economic growth through innovation within the identified economic geography.
- EOI submitted 25th July 2018 – **NOT SUCCESSFUL** (confirmed 1/3/2019)

Highlands & Islands – Technology Innovation in the Marine Environment (HI-TIME)

Vision – A regional cluster model for marine innovation, technology and skills

The Highlands and Islands is at the forefront of the development of the marine economy with its abundance of natural marine resource, major test and demonstration infrastructure, and strong science and innovation foundations.

Global aquaculture, marine biotechnology and wave & tidal industries, amongst others, are seeking locations to research, test and demonstrate new technologies in the marine environment, and the Highlands & Islands will develop its key strengths to position itself as the most desirable international location. **The Strength In Places Fund will help us provide the key ingredients of scientific knowledge, state-of-the-art equipment and facilities, technical support, business investment, a skilled workforce, and attractive incubation and touchdown space for businesses, and become recognised internationally as an Innovation Region for Marine technologies.**

In doing so, as well as generating increased economic value to the UK, the people and communities of the Highlands & Islands will enjoy economic gain through the growth and sustainability of jobs; new investments in key regional infrastructure; and direct benefit from the users of our marine and coastal assets.

So, right now....

- The MAXiMAR Consortium is fleshing out its detailed action plan (picking up the actions from SIPF) and considering resource requirements
- Organising industry and academic workshops to inform the innovation and technical challenges that need to be taken forward
- Working across Scotland to develop a wider Scottish Marine Economic Strategy – Marine Scotland; Crown Estate Scotland; Scottish Enterprise; Business-University Leaders Forum
- Working hard to align these marine opportunities with other funders and funding bids eg. Macrihanish; European Marine Science Park
- Reaching out to Arctic regions/Norway/Canada/EU to develop relationships and future collaborative funding opportunities
- Raising awareness, eg with COHI partners

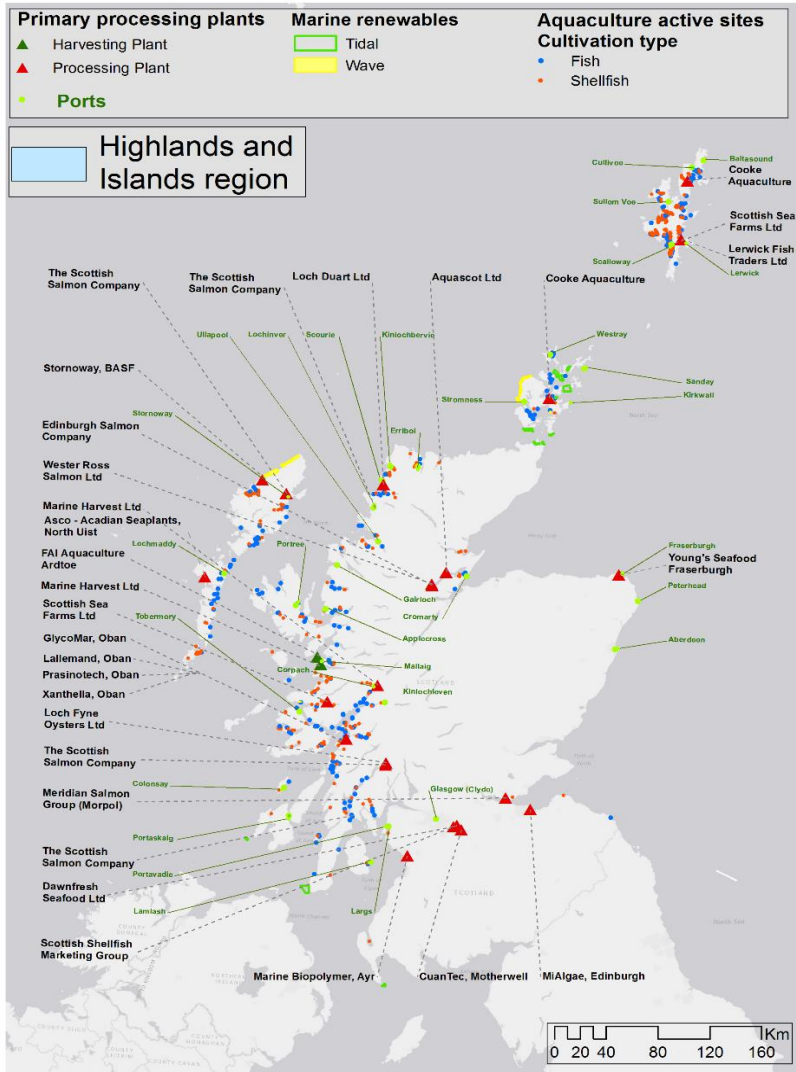
Future Vision

- A region that, alongside regions in Norway and Canada, is recognised as THE best place to go for the marine industry to invest, test, demonstrate, innovate, and locate – **Jobs; Investment; Community benefit**
- Strong partnerships are developed to foster greater co-operation in maritime science and technology to stimulate innovation - **H & I recognised for its part in Advancing Science and Innovation globally – Building on our academic capability and reputation**
- Infrastructure in key locations like Macrihanish, Dunstaffnage, Stornoway, Stromness, Scalloway are invested in and joined up to provide a regional proposition – **Scaled up activity; Multi-site investments; State-of-the-art facilities**
- Education and research provision doubles in size thus training our own workforce in the region for the region – **Skilled workforce; Attractive place to Study**
- Recognition of the sustainable manner in which our unique environment is being both economically and environmentally optimised – **an internationally exemplar region**

How can COHI partners help

- Recognise that we are in this together competing with a global market
- Look for areas of synergy with your local developments – how do they support the regional proposition? How can areas join forces to create something with more reach?
- Talk up the 'marine opportunity' at every opportunity to reinforce our unique area of specialisation
- Engage with HIE as we develop a marine economic strategy
- Support local activities that fit with this strategy eg. the developing Marine Training Facility at the European Marine Science Park
- Alignment of regional growth Deals

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- 5 NRIP Sites; major port developments; Ultra-Deep water Decomm site
- Plus Marine Tourism, Fisheries, Decommissioning....

We need **SCALE – COLLABORATION – FOCUS – ENERGY – CO-ORDINATION** and the ability to react quickly