

# BUSINESS CLUSTER SPECIALISATION IN THE HIGHLANDS AND ISLANDS

Executive Summary - September 2017

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Iomairt na Gàidhealtachd 's nan Eilean

## INTRODUCTION

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Clusters are regional concentrations of activities in groups of related industries. Clusters emerge naturally through market processes, as spill-overs among such activities enhance performance at the firm and regional level. Examples of such positive effects, that often grow with the critical mass in a given location, are a labour market with specialised skills, local supplier networks with specialised capabilities, and a knowledge pool driven by business innovation activities and knowledge institutions. Clusters differ from cluster organisations; the latter manage the networks of firms and other entities within a given cluster. In less populated or rural areas, the 'agglomeration' effects due to the presence of a large number of interdependent firms are weaker. However, rural clusters can be important drivers of development and emerge from: one or more 'pivotal' companies (and their 'ecosystem' of suppliers and partners); from a pre-existing developed set of skills/traditions; or as the result of a natural resource.

The Highlands and Islands region has a rich and diverse economy that has developed significantly over the last 50 years. This study sought to explore and map the Highlands and Islands economy through a fresh lens by identifying the existing relative specialisation (employment, value added, technological and scientific) compared to other European regions. Given the specialisation pattern, the study then explored investment, Research and Development (R&D) and innovation activity driving key sectors and clusters and the international linkages (trade and other business networks) that characterise the Highlands and Islands economy. To do so, we exploited not only 'official statistics' but also 'open data' on public funding being spent on or secured by regional firms (from HIE, Scottish, UK and EU agencies) to create a heat-map of investment.

To provide a comparative perspective, a set of benchmark regions were selected based on similar size of population, comparable population density and similar economic specialisation. The regions are mainly from the neighbouring Nordic countries including four Norwegian regions, the three most northern Swedish regions, the Danish region of North Jutland, the region of Western Finland, the Irish region of Border, Midland and Western, Northern Ireland and the Baltic State of Estonia.

The three Norwegian regions are more specialised than the Highlands and Islands in fishing and fishing products. Environmental services is a clear comparative specialisation for the Highlands and Islands, with none of the benchmarks having a higher specialisation. The Highlands and Islands specialisation in metalworking technology and upstream chemical products is also the highest among the regional benchmarks. Forestry is the fourth most specialised cluster for the Highlands and Islands, however, compared to the Finnish and Swedish regions and Estonia, the Highlands and Islands forestry cluster is relatively weakly specialised.

These 'highly specialised' benchmark regions may provide future opportunities for 'learning' for the Highlands and Islands business cluster, when comparing skills profiles of employees, new product development or novel business models emerging in the benchmark regions.



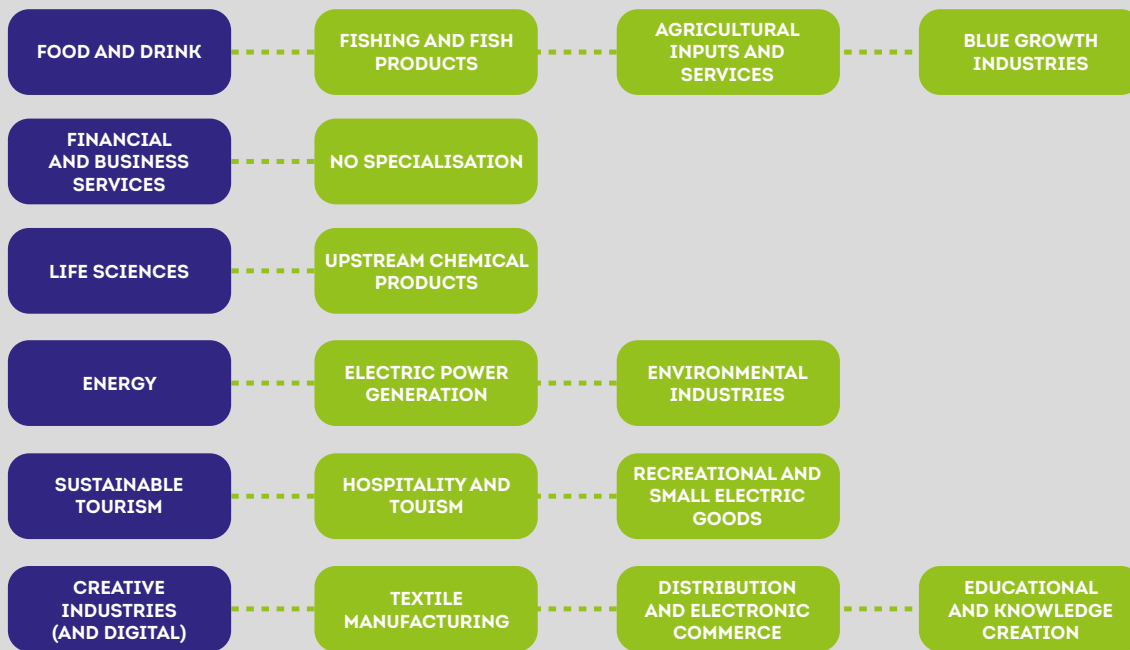


## HIGHLANDS AND ISLANDS BUSINESS CLUSTERS: CLUSTER SPECIALISATION

Relative to other EU regions, the 5 most specialised clusters by employment are fishing and fishing products, environmental services, metalworking technology, forestry and upstream chemical products.

In contrast, the 5 most specialised by GVA are metal mining, aerospace vehicles and defence, printing services, medical devices and lighting and electrical.

### SPECIALISED CLUSTERS GROUPED BY KEY SECTOR



\* Analysis is based on the cluster definitions of the European Cluster Observatory.



The Highlands and Islands region is relatively specialised (employment criteria) in two European emerging industries: blue growth industries and environmental industries; and in medical devices in GVA terms.

## EMPLOYMENT AND PRODUCTIVITY



14 specialised clusters (employment criteria) account for 66% of total cluster employment. Distribution and tourism alone employ a third of the workforce

# 52%

15 specialised clusters (GVA criteria) account for 11% of total cluster employment, but 52% of regional GVA



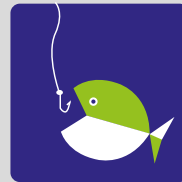
Compared to equivalent clusters in selected benchmark regions: environmental services (16%), metalworking (15%) and textiles (14%) created relatively **more jobs**; while textiles environmental services and environmental industries paid relatively **higher wages** (2010-14)

**Employee qualifications** in Highlands and Islands clusters are relatively more sophisticated, on average, compared to benchmark regions

**Productivity performance** relative to benchmarks is good in agricultural services, electricity generation, forestry, non-metal mining and recreational products clusters; as well as in **blue growth** and **environmental industries**

## INNOVATION AND INVESTMENT

The share of **innovation active enterprises** in the growth sectors and specialisation clusters is higher and in the food and drink and tourism sectors the share is **double** the Scottish average



# 40%

of all Scottish R&D performing fishing and fishing products firms are located in the Highlands and Islands



Cross-industrial and cross-technology patenting activity point to interesting opportunities in biological materials, medical technology and measurement technologies



Public investment to Highlands and Islands firms is estimated to be at least £213m since 2009. At least £35m has been for innovation projects. Four clusters absorbed a third of funding - renewable energy, tourism, aquaculture and metalworking (engineering)



EU funding has been critical for wave and tidal and marine life science investment (a total of £27m since 2007)

## STRATEGIC CLUSTERS

The research identified three classes of clusters, namely clusters of distinction, clusters of competence, and clusters of opportunity. The proposed clusters are intended as a basis for further discussion by 'cluster stakeholders' in the Highlands and Islands.

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### CLUSTERS OF DISTINCTION

### QUINTESSENTIAL CLUSTERS THAT BOTH DEFINE AND BRAND A LOCAL ECONOMY AND PARTICULAR PLACE

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Wave and tidal energy

Unique natural resource twinned with world-leading know-how and technology demonstration sites attracting significant UK and EU funds into region. The wave and tidal energy sector is already well structured in terms of sectoral associations, energy research and demonstration facilities and innovative funding mechanisms like WES. Geographically concentrated in the Orkney-Caithness area, the cluster may face challenges from the BREXIT outcome given the importance of EU funding and support to date.

Aquaculture and marine products

Significant scientific and business activities are concentrated in the region, although many firms are not locally owned. A number of strategic initiatives already in place but there is potential for stronger growth and to diversify production (e.g. seaweed cultivation and harvesting). The cluster benefits from the Scottish seafood brand internationally and Scottish wide initiatives such the SAIC. The cluster has also been a key recipient of EU funding and alternative funding sources may be required post-BREXIT.

Engineering services for 'harsh environments'

Building on the strong metalworking technology specialisation cluster, with notable interlinkages to offshore energy but also economy-wide applications. Clustering could help define the engineering skills needs of the region and brand and market the existing expertise in relevant international markets. Promoting joint demonstration, testing or consortia for larger projects may help scale up smaller engineering operations and increase R&D spend, etc.

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**CLUSTERS OF COMPETENCE****HIGH CONCENTRATION OF COMPANIES, SKILLS AND SPECIALISED SUPPORT BUT LACKING UNIQUENESS AND OPERATING WITHIN A MORE DIVERSIFIED REGIONAL ECONOMY**

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Adventure tourism, including maritime	The tourism sector is facing up to digitalisation and global market trends and seeking to increase the value added it generates. Efforts to develop and structure 'adventure tourism' to exploit the natural environment of the region are underway. Initiatives such as North Coast 500 are helping to redefine the regional brand. In this respect, digital skills and specialised design and marketing expertise in the regional creative industry sector will need reinforced. The potential for increased maritime (e.g. yachts) tourism offers a cross-cluster linkage to a 'mini-cluster of boat-yards' and related engineering services that could foster the expansion of skilled and value-added services around the region.
Premium food products	Food and drink sector is critical for economy but there is a fragmented innovation effort with limited cross-sectoral linkages. This suggests a possible role for several larger firms to lead and structure larger and longer-term food innovation partnerships. There are clear cross-cluster linkages with (marine) bioscience but also tourism and hospitality businesses and creative industries (packaging design, digital marketing, etc.).
Creative industries (textile and design)	The Creative Industries sector in the Highlands and Islands is diverse and HIE with regional partners has already put in place a Creative Industries Strategy for 2014-19 including a broad range of actions and initiatives (e.g. XpoNorth, creative industry networks for screen and broadcast, writing and publishing, craft fashion and textiles and music). The region has a traditional textile sector which is not homogenous in nature (ranging from traditional knitwear and tweed to more modern fabrics) and is geographically dispersed. Within the creative industries key sector, the textile and textile products sector has benefitted from over a third of total funding during the past 5 years. The cluster has also shown a trend towards being a relative specialisation of the region. Related (digital) design skills and know-how are located in the region and the recent development of the Creative Campus of Glasgow School of Art and a number of related projects to draw on and develop design skills. Transforming and further increasing the added value that can be generated from textile and related designer goods based on the Highlands and Islands culture and landscape is one possible focus for a future cluster initiative.

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**CLUSTERS OF OPPORTUNITY****SEEDS OF CLUSTERS OF SUFFICIENT SIZE AND RESOURCES TO PORTEND GROWTH, OR DECLINING CLUSTERS WITH THE FORESIGHT AND CAPACITY TO REINVENT THEMSELVES**

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'Natural products'	This cluster has been identified in past HIE strategy work and emerges clearly from the technological and scientific specialisation as well as being captured in the mapping data through companies in several of the specialisation clusters (upstream and downstream chemicals, environmental services, biotech under professional, scientific and technical activities, etc.). A challenge is that the significant investment into scientific activity on marine biosciences (SAMS, etc.) is not yet matched by the same scale of business growth. The cluster has a high potential for generating sustainable, high value-added jobs across the region. There are also clear linkages to the Scottish industrial biotechnology strategy.
Forest-based industries	The forestry sector is an important natural resource and the region has a range of companies operating in various related activities, including some larger and technology advanced companies in the wood processing chain. However, value added is lower than in other benchmark regions and more could be done to build cross-sectoral linkages with sustainable construction or natural products. A strategic initiative adopting a value chain perspective could help leverage the full economic value of the forest-based industries sector (including new bioenergy or industrial biotechnology products)
Environmental services	The region has a relatively important scientific output in environmental science and ecology and a growing environmental services sector. In addition, other relevant companies are captured under the SIC code for professional scientific and technical activities. Given global trends, the cluster is likely to be a source of growth in higher value-added niche but currently the companies active in this cluster are not well identified.
Digital healthcare and devices clusters	The technology profile of the region includes a significant concentration of know-how in medical technology, biotechnology, analysis of biological materials and related instruments. A range of public-private digital health initiatives are already being developed and the region hosts both a large international firm and a range of smaller tech-based firms. The potential for cluster growth is dependent on whether the smaller companies can 'scale-up' and grow internationally while retaining ownership locally.

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## CLUSTER CATEGORIES AND FUTURE PLANS

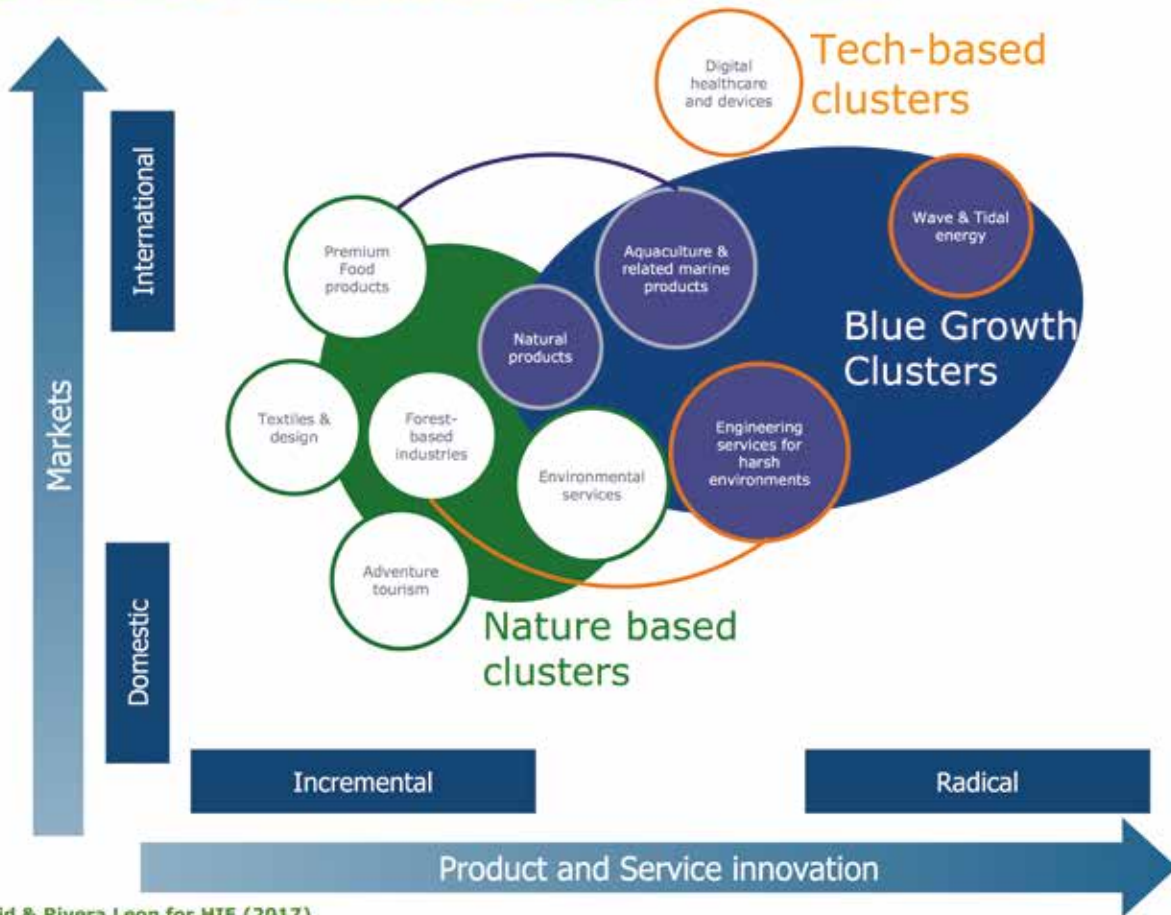
The ten strategic clusters identified can be grouped in three broad categories:

- blue growth clusters;
- nature based clusters;
- technology-based clusters.

The diagram and the classification are illustrative and should not be read as 'set-in-stone', rather the proposed strategic clusters and grouping are intended to stimulate further discussion amongst business, innovation, public and indeed community stakeholders. It should be little surprise that the sea-land nexus so present in the life and culture of the Highlands and Islands is reflected also in the mapping of strategic clusters.

Perhaps more unpredictably, the findings point to a critical and increasingly important role for advanced engineering, analytical and testing expertise in two hybrid 'manufacturing-service' clusters: engineering services for harsh environments and environmental services. The former is based on a significant number of long-established companies spread across the region (but notably concentrated around the Moray Firth coast line centred on Inverness but ranging from Elgin to Thurso) that serve both the offshore industries (initially oil and gas and increasingly marine renewable energy) and civil engineering and manufacturing projects on land; the latter, is a newer, emerging cluster that provides expertise to both maritime and land based industries and includes several 'start-ups' in specialised niche such as water ecosystem restoration.

### Highlands & Islands Strategic Clusters





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The wave and tidal energy cluster is primarily located in the Orkney-Caithness corridor but draws on expertise from across the region (the previously mentioned engineering and environmental services) and indeed from further afield in Scotland, the rest of the UK and the EU. The cluster has been a magnet for funds, notably EU regional and R&D funding and is, today, on the cusp of full scale commercial exploitation of wave and, particularly, tidal power. The cluster is already relatively well-organised with various 'industry associations', public initiatives such as Wave Energy Scotland and triple-helix (public-private-academic) type co-operation and investment into required technical and technological infrastructure. However, the shift from development to full-scale commercial operations (and how to ensure business models adopted favour that value added and profits are retained in the region) and the risk of a negative effect from BREXIT leading to the flow of European funds drying up, may require further efforts to boost coordination and networking between regional businesses.

Within the blue growth 'mega-cluster' aquaculture and natural products (marine biotech, algae and seaweed cultivation) are significant clusters of activity, with both regional and internationally owned firms actively investing in developing new technical solutions and products to enhance productivity and value added. The aquaculture cluster, in particular, has developed a strategic plan and secured recent investment to support innovative developments and tackle technical and environmental obstacles to further growth. Further efforts to develop the cluster could bear fruit in terms of solving common challenges (fish-health, reducing environmental side-effects, etc.) but also through exploring potential synergies with offshore or deeper water expertise available in the engineering or marine renewable clusters.

Natural based products are notably based on the marine biology know-how located in the region (the SAMS research centre) with a distinction between several larger firms operating at industrial scale and a number of smaller newer ventures seeking to exploit potential niche. There has been less attention paid to natural products from land-based ecosystems. The potential for cross-cluster linkage with forest-based (and other mountain/rural) businesses are under-exploited and there are grounds for exploring how environmental expertise on ecosystem restoration, protection and valuation can be twinned with that of the forestry and food clusters with a view to the development of higher value added 'bio chemicals', natural food products, etc.

The three clusters grouped under the heading of tech-based clusters reflect the technological specialisation (digital medical and measurement technologies, captured in the analysis of patenting), the flow of money to R&D and pre-commercial development of wave and tidal energy and the embedded expertise of the region's many engineering companies in developing both mechanical and electronic solutions that can withstand harsh (notably marine) environments. The label 'tech-based' should not be interpreted to suggest that other clusters are not developing new technologies, rather it is a pointer to a fundamental driver of competitive advantage for the three clusters. Only in the case of the digital healthcare and devices clusters is technological know-how the main driver, in the others locational advantage (oil and gas initially and latterly tidal and wave energy potential) and accumulated expertise are equally important.

Turning to the nature based clusters, the Highlands and Islands has a significant group of larger companies operating in premium food sectors with strong international brand recognition allied to a range of smaller/newer firms that are developing additional niche products (e.g. craft beers, gin and new whisky distilleries, etc.) as well as traditional family-run food companies that are internationalising (e.g. in the bakery sector). The study has pointed to a somewhat 'fragmented' innovation effort and the opportunity to structure and enhance growth based on stronger joint branding or marketing efforts.

Links to other premium products (e.g. textiles, high-value tourism, creative industries, etc.) already exist but could be further developed through more pro-active cluster management.

Past work on adventure tourism has highlighted the potential of this cluster for the region (and Scotland, more generally). The tourism sector is a major source of revenue and jobs in the region but in terms of value added and scale of operations there remain challenges to be overcome. Cross-cluster co-operation with food, textiles and the forestry sector are to be encouraged. The growing pressure on land use is a global trend and in the Highlands and Islands the longer-term balance between different forms of activity and land-use could potentially threaten the growth potential of adventure tourism, forest-based bio-products, food and other natural products. Hence, a cross-cluster roadmap/action plan drawing on expertise from the nature-based clusters would be a potential idea to explore.

The creative industries sector in the Highlands and Islands has in place an ambitious strategic plan and has developed a series of actions to further develop the various sub-sectors. The argument for further efforts to structure textiles and design potential relate to both the recent trends and investment patterns in the textile sector and the potential for enhanced interaction with (digital) design expertise; both in other creative industry firms and initiatives such as the new Creative Campus, located near Forres, of the Glasgow School of Art.

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