



Blue Economy
Cluster Builder



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Blue Economy Cluster Builder Market Report

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This study was completed for:

Lynsey McCue, Project Manager, Major Programme Management
Scottish Enterprise

Contact:

Tel: +44 (0) 141 468 6030 | Mobile: +44 (0) 7342 068913

Email: Lynsey.McCue@scotent.co.uk

This study was completed by:

Aquatera Ltd
Old Academy Business Centre
Stromness
Orkney
KW16 3AW

Contact: Jennifer Fox

Tel: 01856 850 088

Email: Jennifer.fox@aquatera.co.uk

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1 INTRODUCTION

In 2010, the Blue Economy's output was estimated at US\$ 1.5 trillion in gross value added ("GVA") and this is projected to increase to US\$3 trillion in 2030 (OECD, 2016). The size of the growth related to the Blue Economy represents a significant opportunity for governments, businesses and organisations in Scotland.

This document highlights the evident importance that the Blue Economy (BE) plays in the Scottish economy, shedding light on Scotland's commitment to the Paris Agreement ¹ as a trigger for technological and institutional innovation in the BE. Indeed, the necessity to adopt low-carbon practices in cross-cutting industrial areas is spurring innovation in established sectors in Scotland, particularly in the oil and gas (O&G) industry, opening debates about planning the future through methods that foster technological innovation and collaborative capacity building processes.

Rangen & Foo-Hodne (2019) emphasises that regional business clusters emerge as natural phenomenon around a combination of conditions, but the level of success of the clusters in achieving an increased impact in the local and global markets lies in the stakeholder engagement capacity among the cluster members. In fact, Donahue et al. (2018) highlights that in order to build a strong regional cluster structure, it is crucial to implement cluster interventions that facilitate collaboration among the cluster stakeholders, such as: strengthening information networks, developing shared talents, strengthening research and development (R&D) activities, fostering investments in infrastructure and improving mechanisms to provide capital access.

The core purpose of the Blue Economy Cluster Builder (BECB) is to strengthen the BE cluster in Scotland to operate locally and globally. Therefore, after introducing an overview about the BE sector in Scotland (Aquatera Ltd, 2019), this report offers an overview on the BECB project and its strategies to increase the stakeholder engagement capacity among members of the BE network.

2 AN OVERVIEW ABOUT THE PRESENT AND THE FUTURE OF BLUE ECONOMY IN SCOTLAND

The BE is a natural phenomenon that emerged in Scotland given its geographical conditions that have historically fostered the development of interconnected sectors across ocean industrial activities. Therefore, the importance of the BE is unquestionable to the Scottish Government and society. The main sectors incorporated by Aquatera Ltd in the BECB (Aquatera Ltd, 2019) are represented in Figure 1.

¹ <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>





Figure 1 Industry sectors incorporated into the Blue Economy Cluster in Scotland

The O&G sector is responsible for the largest share in the current contribution of the BE to the national economy, providing 83% of the BE cluster gross value added (GVA) in 2017, and 5.1% of the Scottish gross domestic product (GDP) in 2019 (Annual Energy Statement, 2020). However, when it comes to employment, the coastal tourism sector stands with the highest headcount rate, with 34% of the employment share, while the O&G sector provides 33% of employment in the BE. In terms of carbon emissions, O&G is the leading cause of CO₂ emissions, being responsible for 89% of the CO₂ emissions in 2019 in the UK, according to the Our World in Data (2020) website (See Figure 2 below).

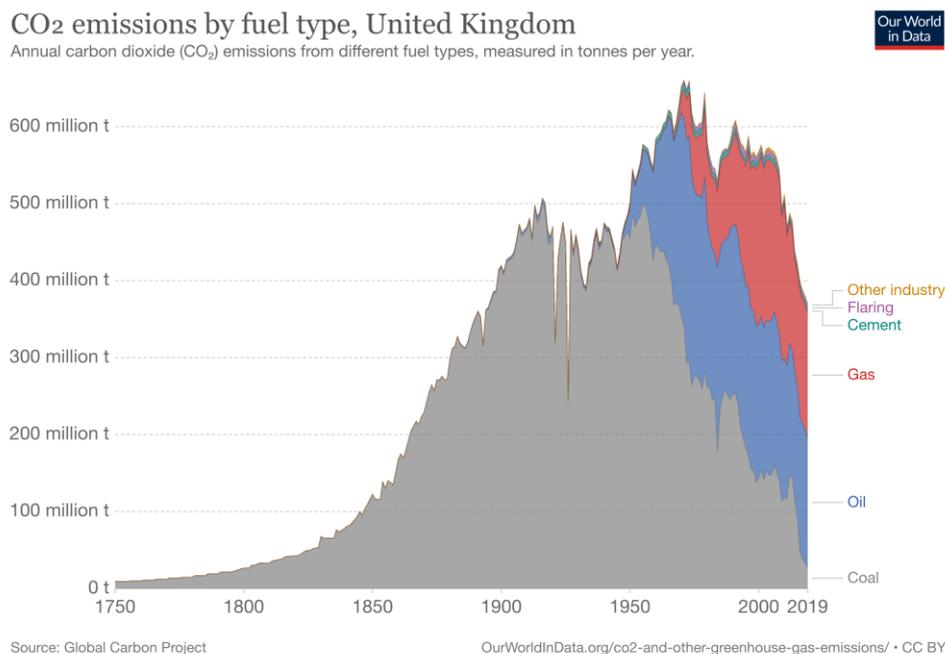


Figure 2 Historical records of CO₂ emissions by fuel type in the UK

Source: Our World in Data, 2020

The commitment of the Scottish Government to the Paris Agreement is clearly pushing the O&G sector to decarbonise its operational structures, as the sector will unavoidably continue to play a significant role in the global energy matrix by 2050 (Annual Energy Statement, 2020). Moreover, the global pressure to decarbonise economies is leveraging



authorities to disincentivise the O&G sector with public policies designed to shift the energy matrix around the globe. The result of this global pressure on the O&G sector is clear in the projected numbers for the Scottish BE, illustrated in the Table 1. Indeed, the Scottish Government is strategically incentivising low-carbon energy solutions (such as Hydrogen and Marine Renewables) in order to support the country to meet the country's carbon neutrality commitment by 2045 (*Annual Energy Statement 2020, 2020*).

A comparative analysis conducted by Aquatera Ltd (Aquatera Ltd, 2019), illustrated in Table 1, suggests that the O&G sector is projected to reduce their participation both in the national employment and GVA results. Table 1 also suggests that this reduction might also reduce the participation of the Blue Economy in the national GVA in 17% by 2030, illustrating the importance of strengthening the Blue Economy Cluster Builder in Scotland in order to increase the BE's ability to develop intertwined capacities to innovate in low-carbon solutions.

Table 1 Employment and GVA growth analysis in the Blue Economy in Scotland (Aquatera Ltd, 2019)

Sector	Employment (2017)	2017 Employment Share	Projected Employment (2030)	Employment Growth Rate (2017-2030)	GVA (2017)	2017 GVA Share	Projected GVA (2030)	Projected GVA Growth Rate
Coastal tourism	28.386	34%	35.530	25%	568	4%	788	39%
Oil and gas	27.800	33%	23.762	-15%	11.697	83%	7.361	-37%
Fish processing	7.575	9%	7.262	-4%	406	3%	668	65%
Shipbuilding and repair	7.013	8%	6.154	-12%	198	1%	242	22%
Fisheries	4.747	6%	5.543	17%	315	2%	530	68%
Ports, warehousing and water Projects	4.221	5%	8.501	101%	438	3%	700	60%
Aquaculture	2.344	3%	3.231	38%	236	2%	568	141%
Shipping/ Maritime transport	1.955	2%	1.909	-2%	126	1%	176	40%
Marine renewables	463	1%	7.237	1463%	70	0%	648	826%
Overall	84.504	100%	99.129	17%	14.054	100%	11.681	-17%
Desalination	Unknown	-	Unknown	-	Unknown	-	Unknown	-
Coastal and environmental protection	Unknown	-	Unknown	-	Unknown	-	Unknown	-
Blue biotechnology	Unknown	-	Unknown	-	Unknown	-	Unknown	-



3 STRENGTHENING THE BLUE ECONOMY THROUGH CLUSTER INTERVENTIONS

Pinto et al. (2015) states that the natural emergence of clusters is based on the presence of multiple actors in a determined geographical context, operating interconnected industries, suppliers, service providers and associate institutions, influenced by positive externalities of knowledge share and workforce agglomeration. Donahue et al. (2018) suggests that, in fact, firms and regions might benefit from clustering, but successful clusters must identify constraints and opportunities into the clustering industries in order to respond to constant internal and external demands for innovative solutions for global challenges (Rangen & Foo-Hodne, 2019).

Donahue et al. (2018) indicates that the first step of the cluster strengthening process to foster innovation and market growth is a “quantitative and data analysis to identify and prioritize cluster opportunities in service of broader economic development goals”. After identifying constraints and opportunities, Donahue et al. (2018) suggests that interventions to strengthen clusters must address actions to improve the capacity of the cluster to share knowledge and information, develop talents and research capabilities, invest in shared infrastructure assets and provide capital access.

Finally, Pinto et al. (2015) reveals that the strength of the links among cluster members might spur innovation and the regional development around human and social capital, however the quality of the cooperation among cluster members depend on their capacity to cooperate, as well as the members’ experience with innovation and collaborative processes.

Given that strengthening innovation capacity and developing new products and services are key actions in the Scottish Blue Economy to support the sector to overcome the challenges imposed by global climate change policies and address the national energy transition strategies, the Blue Economy Cluster Builder was designed to **strengthen the connections among SMEs from different sectors within the Blue Economy in order to leverage their capacity to innovate and collaborate.**

4 THE BLUE ECONOMY CLUSTER BUILDER ACTION AND COMMUNICATION PLAN

Given that achieving a higher level of stakeholder engagement among BE actors is a key output for the success of this project, the action and communication plans of the BECB project are constantly focused on actions to increase the level of interactions among cluster members and non-members. Indeed, the Communication Plan was designed to implement action in multiple public engagement platforms, such as: events and 1-2-1 activities, mailing list, bulletins, and the website and social media platforms.

Moreover, the Blue Economy Cluster Builder project framework aligns with combined cluster strengthening actions suggested by Donahue et al. (2018) and Rangen & Foo-Hodne, (2019) as key strategies to achieve self-reinforcing cycles of growth, which include:

- producing shared knowledge and information – in a specific platform designed for the project - conducting data collection and analysis to identify threats and opportunities for the sector;
- increasing the engagement capacity of SMEs with multiple national and international stakeholders and sectors (going beyond basic interactions among Universities, Government Bodies and Private Sector);
- increasing the awareness of the BE about investment mechanisms and capital access for innovation, and
- leveraging capacity building actions and investments in shared infrastructures.



The Project Team is working with over 850 companies (Figure 3) that have been identified thus far, encompassing the Highlands and Islands and Scottish Enterprises' priorities. Our purpose is to increase this number through targeted efforts in dissemination, engagement and networking with our SAG experts in order to maximise the representative nature of the Cluster Builder of the BE in Scotland.

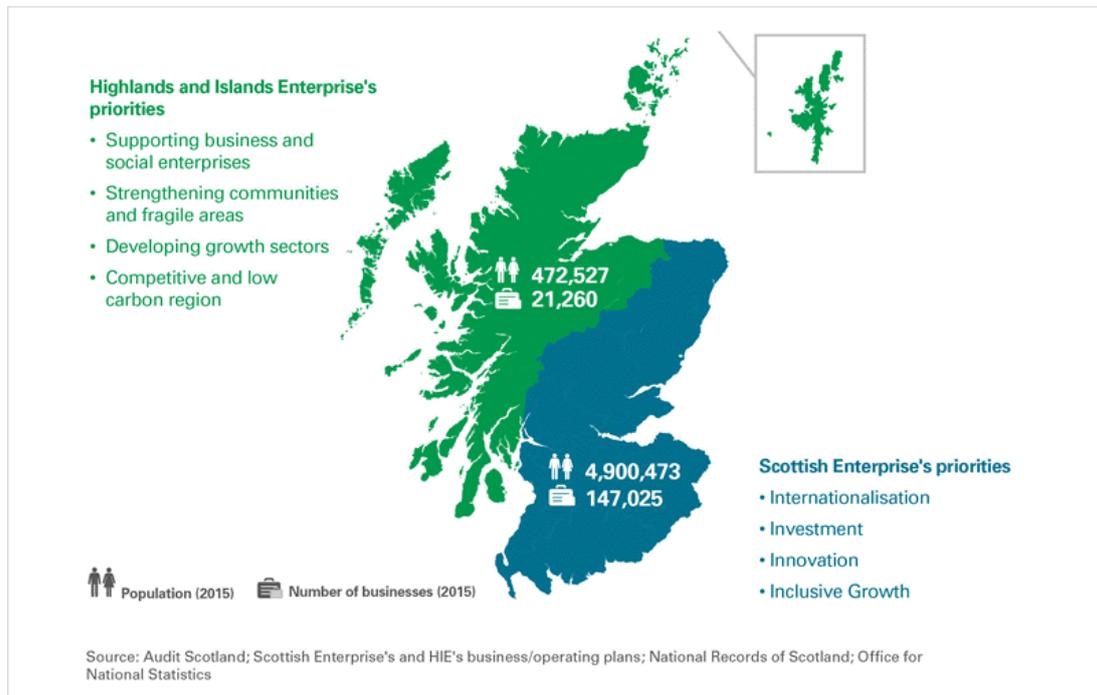


Figure 3 - Map of Scotland showing the SE area and Highlands and Islands Enterprise (HIE) area.

Source: Audit Scotland; Scottish Enterprise's and HIE's business/operating plans; National Records of Scotland; Office for National Statistics

5 CONCLUSION

The Blue Economy plays a key role in the Scottish political-economy due to several factors such as its geography, the historical interaction between the ocean and communities, and the natural environment. Additionally, the presence of the O&G sector and its supply chain in the industrial BE cluster has leveraged the importance of BE in the Scottish economy, given its share in the national GVA. However, the impact of global measures against climate change is pushing the sector to invest in innovation to both decarbonise BE industrial sectors and shift the energy matrix to low-carbon alternatives.

Academic studies about industrial clusters suggest that external influences, such as climate change, on regional clusters demand cluster interventions in order to strengthen the clusters' capacity to innovate and avoid industrial disruptions. Cluster intervention actions must focus on improving the capacity of the cluster members to share knowledge and collaborate in actions for capacity building and innovation.

The Blue Economy Cluster Builder project is designed exactly to improve the capacity of BE members in Scotland to collaborate in innovative actions. Activities of public engagement, capacity building workshops, data collection and data



analysis and direct support for SMEs will underpin the strategies of this project in order to leverage the capacity of SMEs operating in BE in Scotland to collaborate and innovate.

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