

Literature Review on a Marine Just Transition: UK and International Comparator Countries



AGRICULTURE, ENVIRONMENT AND MARINE

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Introduction

This report presents two related literature reviews which have been undertaken by Marine Directorate social researchers on the topic of a just transition for coastal communities and marine sectors. These are social research outputs intended to collate the existing evidence and understanding of issues relating to a just transition for marine sectors and coastal communities, to inform policymaking. This is not a policy document. This work has been informed by policy priorities and has been undertaken to support policy development. However, the information presented reflects what is found in the relevant evidence and literature and does not necessarily reflect Scottish Government policy positions.

The concept of a just transition for marine sectors and coastal communities is relatively new in both research and policy contexts. Whilst some of the literature on a marine just transition is several years old and has already been considered in the development of policy (e.g. in the development of marine spatial planning in Scotland), these literature reviews bring together research on a marine just transition for the first time. They focus on how marine sectors and coastal communities are affected as we move towards biodiversity and climate goals, and how impacts on the people affected can be, and in some cases have been, minimised. These reviews predominantly consider impacts on fishers alongside coastal communities more broadly, as this is where most research has so far been published. The coverage here therefore reflects the current evidence base, but we are aware that the just transition covers a much wider range of considerations that are not included here. Although the term just transition is commonly used in the Scottish policy context, due to its relatively new and novel nature it is not commonly used within UK or international academic literature. How this impacted the literature searches is discussed in the Limitations sections of both the [UK-based](#) and [international review](#).

The [first literature review](#) presented is focussed on the topic of a marine just transition within the United Kingdom (UK), with a focus specifically on Scotland. This review investigates the impacts of a move towards climate and biodiversity targets on coastal communities and marine sectors in the UK, outlines what measures have been put in place so far to reduce any negative consequences of the aforementioned impacts across the UK, and explores what could be done in the future to support a just transition for coastal communities and marine sectors in Scotland.

The [second literature review](#) investigates existing policy practices on the topic of a marine just transition in an international context, specifically focusing on marine renewables and its impact on fisheries in countries comparable to Scotland. It investigates what “just transition oriented” policies (e.g. policies that help to ensure more just impacts on marine sectors and coastal communities) on marine renewables and fisheries have been implemented internationally in countries similar

to Scotland¹, the strengths and weaknesses of these policies in relation to a just transition, and how these learnings can be applied to Scotland.

The final section of this report brings together the two reviews, providing and comparing the findings of both literature reviews in one place. These literature reviews strengthen our understanding of the evidence base to help policy makers, stakeholders and those impacted by changes to support the delivery of a just transition for coastal communities and marine sectors in Scotland.

¹ The comparator country learnings are appropriately caveated with the nature of the devolution settlement in the UK in relation to marine policy.

1. A literature review on a marine just transition for coastal communities and marine sectors in the UK, with a focus on Scotland

1.1. Executive Summary

1.1.1. Context

This literature review addresses the topic of a marine just transition in the United Kingdom (UK), however it has a particular focus on the evidence concerning how a just transition could be achieved for coastal communities and marine sectors in Scotland. This review investigates the impact of a move towards climate and biodiversity targets on coastal communities and marine sectors in the UK, outlines what measures have been put in place so far to reduce potential negative impacts of a move towards climate and biodiversity targets on coastal communities and marine sectors across the UK, and explores what could be done in the future to support a just transition for coastal communities and marine sectors in Scotland.

This literature review presents findings from published peer-reviewed academic literature, governmental policy documents and published non-governmental organisation reports found through a systematic literature search process. This literature review does not represent the Scottish Government's policy position. It instead provides a summary of already published information from a range of sources and highlights evidence gaps that have been identified. This literature review was produced in line with the Government Social Research Code, which aims to ensure all social research is produced with honesty, integrity, impartiality and objectivity (UK Government, 2024).

1.1.2. Research questions

This review seeks to answer four research questions:

1. What are the main changes that are likely to occur that affect coastal communities and marine sectors in the UK as we move towards biodiversity and climate change goals?
2. How are coastal communities and marine sectors likely to be impacted by these changes in the UK?
3. What has already been done to reduce negative impacts and increase positive impacts on coastal communities and marine sectors in the UK?
4. What should we do to ensure a just transition for coastal communities and marine sectors in Scotland?

1.1.3. Main findings

- The literature reviewed highlights that the main changes likely to occur that affect coastal communities and marine sectors in the UK as we move towards climate and biodiversity goals are:
 - Changes in fish species availability;
 - Sea level rise and increased storm frequency leading to increasingly unpredictable coastal and marine spaces to live and work in;
 - Declining oil and gas production;
 - Increased offshore renewable development;
 - Increased marine protection;
 - Increased competition for space in our seas, especially between fishers, marine protected areas and renewable development.
- Acknowledging the wider benefits of offshore renewables in delivering on Net Zero ambitions and to the economy, some of the evidence consulted as part of this literature review suggests that offshore renewable developments could impact coastal communities onshore and offshore in both positive and negative ways. This includes effects on jobs and the wider economy, visual impacts, infrastructure impacts where developments are connected to the land, and potentially positive and negative impacts on tourism and recreation activity.
- Fishers may also be impacted by offshore renewable developments which could affect fish stocks, or limit fishing grounds. This review identifies evidence gaps regarding safety, liability and insurance concerns of fishers fishing within offshore static and floating windfarms, and on the extent to which projected job opportunities will become available in affected coastal communities or marine sectors, including opportunities for fishers, from the growth of offshore developments and related supply chains.
- This review has found that increased marine protection will benefit the environment but could have positive or negative impacts on people's perceptions of the sea, marine tourism and recreation. Marine protection may lead to increased competition for marine space for fishers, and impacts may affect different fishers differently depending on fisheries management measures.
- As Scotland moves towards climate and biodiversity goals and as the abundance of some marine species decrease or increase due to climate change, fish species availability may change. Some of the sources consulted suggest that quotas and licence restrictions alongside potential spatial competition could make it harder for fishers to adapt to climatic changes if quotas and licenses do not keep pace with changes in species availability.
- This literature review has found that displacement and diversification of fishing effort could occur as a result of spatial restrictions on fishers' actions. This could have adverse effects on fishers, including increased competition for space, costs and safety concerns. Fishers may move into jobs other than

fishing, although ties to the fishing industry are perceived to be strong. The evidence reviewed highlights that changes to the use of the sea may impact cultural, historical and social connections to the sea. Changes to fishing practices could impact the economic viability of some coastal communities and could potentially impact coastal depopulation.

- There is a perception in the literature that there has been low coastal community and fisher participation in marine governance in Scotland and the wider UK, which may be undermining trust in decision-making.
- The literature details where some work by the UK and Scottish Governments, and developers, has already been undertaken to help support more just impacts on marine sectors and coastal communities as we move towards biodiversity and climate goals. These include engagement, participation and co-management opportunities for stakeholders, impacting how government decision-making is done in a more collaborative and therefore just way. It also highlights specific measures which could lead to more just impacts on local communities and marine sectors: community benefit schemes; co-location opportunities and fisheries compensation.
- This review highlights some of the suggestions in the literature that could help make any changes more just for coastal communities and marine sectors in Scotland and the wider UK. These include: improving engagement and participation opportunities, improving the capacity of stakeholders to participate and ensuring participants are listened to. Improved co-management opportunities could provide benefits to marine governance, and more development of co-location opportunities could enable mixed-use of the seas, addressing some spatial concerns. Building wealth in coastal communities is needed to help marine sectors and coastal communities to adapt to changes they are experiencing. This could occur through funding upskilling and diversification; reviewing or standardising community benefits; exploring community ownership of offshore renewables; or reviewing and standardising fisheries compensation. Any policies affecting coastal communities and marine sectors should be monitored and evaluated to ensure they are having just impacts.
- This review has highlighted that there are significant evidence gaps on the topic of a marine just transition in the UK, and some areas of research are not up-to-date. This review predominantly focusses on fisheries, as this is where most literature has been published. Limited research was found by this review on other marine or coastal stakeholders. The topics of aquaculture, marine tourism and wave and tidal developments are areas that also lack evidence in relation to how they may support a just transition. There are also evidence gaps with regards to the extent to which competition for space within our seas is being realised and on impacts of fisheries displacement and diversification. Finally, there are evidence gaps surrounding impacts on coastal communities more broadly.

1.2. Introduction

1.2.1. Overview

This literature review assesses existing research on just transition issues facing marine sectors and coastal communities in the United Kingdom. Although this review distils literature from across the United Kingdom, this review focusses specifically on how a marine just transition could be achieved for coastal communities and marine sectors in Scotland. This review presents the findings of a social research systematic review of the literature. This is not a policy document and this review therefore does not necessarily reflect Scottish Government policy.

The Scottish Government aims to make progress towards its climate and biodiversity targets outlined in the Climate Change (Emissions Reduction Targets) (Scotland) Act 2024 (Scottish Parliament, 2024), setting out the Scottish Government's ambition for net zero emissions of all greenhouse gases by 2045, and to becoming Nature Positive by 2030 (as outlined in the Scottish Biodiversity Strategy) (Scottish Government, 2022a). The Scottish Government's Climate Change Plan (CCP) is a statutory document required in the Climate Change (Scotland) Act 2009 (Scottish Parliament, 2009) and contains proposals and policies to deliver towards net zero targets. The current version of the plan is the third Report on Proposals and Policies, published in 2018 (Scottish Government, 2018a), and the CCP update, published in 2020 (Scottish Government, 2020a).² The Scottish National Adaptation Plan 2024-2029 (SNAP3) defines Scotland's priorities for action to adapt to climate change, fulfilling a legal duty under the 2009 Act (Scottish Government, 2024a). The Marine Strategy Regulations 2010 (UK Parliament, 2010) require the UK and devolved governments to take action to achieve or maintain Good Environmental Status (GES), requiring the production of a "Marine Strategy" for all UK waters. The UK Marine Strategy provides the framework for achieving GES, setting out how we will assess, monitor and take action to achieve or maintain GES (CEFAS, 2018).

These plans and targets should benefit the Scottish population as a whole as they help to limit climate change and improve biodiversity, but the wider implications of these changes and their impacts specifically on coastal communities and marine sectors have not been previously explored in detail. This review specifically focusses on the impacts of offshore renewable development, marine protected areas (MPAs), and associated changes to fishing on marine sectors and coastal communities in the scope of a just transition. Details about why this scope was selected are provided in the methodology (see [1.3. Methodology](#)).

² The Climate Change (Emissions Reduction Targets) (Scotland) Act 2024 modifies the Climate Change (Scotland) Act 2009 in relation to the targets for the reduction of greenhouse gas emissions. The 2024 act replaces the system of annual and interim emissions reduction targets with a system that uses Scottish carbon budgets focussing on emissions over a number of years.

1.2.2. Just transition

In order to understand the context of this review, it is important that a 'just transition' is defined. A just transition is at the heart of Scotland's journey towards net zero (Scottish Government, 2023a; 2024b). Within Scottish policy:

“A just transition is both the outcome – a fairer, greener future for all – and the process that must be undertaken in partnership with those impacted by the transition to net zero. Just transition is how we get to a net zero and climate resilient economy, in a way that delivers fairness and tackles inequality and injustice” (Scottish Government, 2021a).

In the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, five just transition principles are set out which ensure that greenhouse gas emissions are reduced in a way which (Scottish Parliament, 2019):

“(a) supports environmentally and socially sustainable jobs,

(b) supports low-carbon investment and infrastructure,

(c) develops and maintains social consensus through engagement with workers, trade unions, communities, non-governmental organisations, representatives of the interests of business and industry and such other persons as the Scottish Ministers consider appropriate,

(d) creates decent, fair and high-value work in a way which does not negatively affect the current workforce and overall economy,

(e) contributes to resource efficient and sustainable economic approaches which help to address inequality and poverty.”

The Scottish Government has four themes in which it wishes to progress towards a just transition (Scottish Government, 2021a):

- Planning for a managed transition to Net Zero that maximises the economic and social opportunities, whilst managing the risks;
- Ensuring people have the knowledge and skills to benefit from a just transition, ensuring there are safety nets in place so that nobody is left behind;
- Involving people who have a stake in the transition in the design of how we manage it, whilst building more resilient and healthy communities;
- Spreading benefits of the transition widely, making sure the costs don't burden those least able to pay.

A just transition is also needed in how people adapt to climate change. Scotland's National Adaptation Plan 2024-2029 (SNAP3) (Scottish Government, 2024a) highlights that achieving a well-adapted Scotland will require a just transition. It recognises that some people and places may be worse affected by climate change than others, and that a just transition means ensuring that adaptation policies are

fair, meet the needs of different groups and deliver ‘wins’ for health, wellbeing, equity and jobs.

Various Marine Directorate publications have highlighted the role a just transition in the marine sphere may take. In Scotland’s Fisheries Management Strategy (Scottish Government, 2020b), the importance of a just transition to the fishing sector is highlighted:

“Now, more than ever, we need a just transition that supports sustainable economic growth and jobs, whilst ensuring no one is left behind”.

In Scotland’s Blue Economy vision (Scottish Government, 2022b), one of the six blue economy outcomes is that:

“Thriving, resilient, regenerated and healthy communities have more equal access to the benefits that ocean resources provide”.

Although the term ‘just transition’ is commonly used in the Scottish policy context, due to its relatively new and novel nature it is not commonly used within the academic literature. How this impacted the literature review is discussed in the section on [1.3.3. Limitations](#). This literature review applies the definition of justice from *Withouck et al.*, (2023) who suggest that justice can be understood on three levels: recognitional (recognising who will be impacted, their histories, and listening to their knowledge and opinions), procedural (the level of participation in decision-making) and distributive (ensuring fairness in the distribution of benefits and harm) (*Bennett et al.*, 2021; *Evans et al.*, 2023; *Withouck*, 2023). All three forms of justice are essential to enable a just transition for coastal communities and marine sectors in Scotland.

1.2.3. Coastal communities and marine sectors

To progress towards understanding how future changes may affect coastal communities and marine sectors, it is important to consider how we define communities. Communities can be identified according to Scottish Government guidance on developing socio-economic impact assessments for MPAs (Scottish Government, 2022c: page 11), as:

- “Communities of place: the people who are connected through living in a particular place;
- Community of practice: those who are connected through activities or livelihoods that they have in common even if they do not share the place;
- Community of interest: a community of people who share a common interest or passion, but may not be linked in any other way”.

In this review, therefore, coastal communities are those who live in coastal areas; those who undertake activities or make their livelihoods (e.g. working in marine or coastal environments or sectors) in marine or coastal areas; and those who have a common interest or passion in the marine or coastal environment. Marine sectors are those people or organisations whose income is connected to the use of the sea

(perhaps due to them working in marine tourism, fish-related industries, offshore energy or transport (Scottish Government, 2024c)), and in many cases these stakeholders can also be members of a coastal community.

1.2.4. Structure of this report

This review firstly provides a detailed methodology, outlining how this literature review was undertaken and detailing the research questions this review aims to address. In subsequent sections, findings related to the four research questions (as outlined in the methodology) are detailed sequentially. The first findings chapter focusses on the main changes that are likely to occur to coastal communities and marine sectors in the UK as we move towards climate and biodiversity goals, with the second focussing on how these changes may impact these stakeholders. The third findings chapter focusses on examples of what has already been done to reduce impacts on coastal communities and marine sectors in the UK, with the fourth findings chapter detailing what needs to be done to ensure a just transition for coastal communities and marine sectors in Scotland. The conclusion chapter provides a summary of the findings highlighted throughout this report.

1.3. Methodology

This section outlines how this systematic literature review was undertaken. The section first outlines the research questions and then details the literature search and review process. Limitations of this research are detailed at the end of this section.

1.3.1. Research questions

This literature review seeks to answer four research questions:

1. What are the main changes that are likely to occur that affect coastal communities and marine sectors in the UK as we move towards biodiversity and climate change goals?
2. How are coastal communities and marine sectors likely to be impacted by these changes in the UK?
3. What has already been done to reduce negative impacts and increase positive impacts on coastal communities and marine sectors in the UK?
4. What should we do to ensure a just transition for coastal communities and marine sectors in Scotland?

1.3.2. Literature search

Literature searches took place in June 2024, with additional searches on marine protection undertaken in September 2024. Initial search terms were identified on this topic by the author and further developed with the relevant policy team. The search terms shortlisted were:

Just Transition; Fair; Equity; Community Benefits; Social Justice; Environmental Justice; Minimising Negative Impacts; Just; Human Rights; Social Inclusion; Ownership; Engagement; Participation; Inequality; Environmental Justice; Energy Justice; Social Justice; Climate Justice; Injustice; Social Impact; Empowerment; Inclusive Growth; Adaptation; Resilience; Marine; Coast; Ocean; Sea; Fisheries; Fishing; Aquaculture; Offshore Carbon Capture; Offshore Renewables; Offshore Wind Farms; Oil; Gas; Tidal; Wave; Hydrogen; Blue Economy; Species; Biodiversity; United Kingdom; Great Britain; Scotland; England; Wales; Northern Ireland

Additional marine protection keywords included in the second literature search in September 2024 were:

Marine Protected Area; Marine Protection; Marine Restoration; Marine Closure; Fisheries Closure; Marine Management Measures; Fisheries Management; Fisheries Mitigation; Marine Mitigation; Marine Conservation; Marine Biodiversity

The author undertook a systematic literature search, and two additional short reviews were provided by the Scottish Government Library. The Scottish Government Library literature review searches used the following keywords:

Marine; Coastal; Fishing; Aquaculture; Offshore; Oil and Gas; Wind; Renewables; Just Transition; Fair; Equity; Justice; Community Benefit; Resilience; Marine Protected Area; Protection; Restoration; MPA; Closure; Management Measures; Conservation; Biodivers*; Mitigat*; Fisheries Management; Empower; Inclus*; Adapt

Search strings were created and tested, covering a wide variety of marine topics. A full list of search strings used in this review are provided in [Appendix A](#). Towards the end of the literature search period, search terms were combined in order to reduce repetition of sources appearing.

Searches with the terms in [Appendix A](#) were undertaken on Google Scholar, Knowledge and Evidence, The Knowledge Network and on Google. Searches took place in each search engine until two pages of irrelevant results were found.

A total of 421 relevant papers, providing research from the United Kingdom, were identified from their title and were shortlisted. Papers were shortlisted if they were focussed on marine topics affecting people. The titles and abstracts of these papers were then reviewed, and 90 documents were shortlisted for full review. Additional marine protection focussed searches found 31 papers of relevance from their title, which were shortlisted to 23 papers when title and abstract were reviewed. This led to a total of 113 papers for full review from the literature search. In addition, some snowballing of relevant papers took place from the reference lists of those papers found in the literature searches. Alerts were also set up for journals which were frequently found in the systematic literature search. Papers found in these ways were also reviewed where deemed relevant. Not all papers reviewed provided relevant insights, so such papers are not included in this review.

Additional searches were undertaken on Google and on the UK Government, Scottish Government, Welsh Assembly and Northern Ireland Assembly websites to find any relevant policy literature on the topic of a just transition. The terms used to find these policy documents are provided in [Appendix B](#). The majority of sources found were published by the Scottish Government. These policy searches led to 18 policy documents also being reviewed. Some signposting of additional publicly available Scottish policy documents occurred, and these were considered for review where appropriate.

The majority of papers of relevance to a marine just transition were on the topic of fisheries, offshore renewables, marine spatial planning, marine protected areas (MPAs), and community benefits of offshore renewables. Papers on oil and gas or carbon capture and storage were not included in the final review, due to the topics being covered in the Scottish Government's Draft Energy Strategy and Just Transition workstream (Scottish Government, 2023b). Papers on shipping were also scoped out of this report due to the Scottish Government's separate transport just transition workstream (Scottish Government, 2023c). No papers of relevance on aquaculture, and very few on coastal erosion (none from Scotland), were found through the literature searches (this may be due to the search terms used), so these topics were not included in the final review as they could not be sufficiently explored with the available literature and were therefore removed from the scope of

this review. The majority of papers included in this review were academic peer-reviewed literature, although reports by charities and governmental reports or policy documents were also included where deemed relevant. No internal Scottish Government documents were used within this review, as only publicly available information was included.

This paper is structured around each research question, rather than specifically around individual marine sectors, due to the high level of interaction between communities and different sectors within the marine space. A sector-by-sector approach was deemed unsuitable in the context of enabling a just transition.

1.3.3. Limitations

There are several limitations to this research:

- There were restrictions on the scope of this report in order to be able to deliver this work within the available time and resources. This included limiting the topics to those highlighted above within the framing of a marine just transition in the UK to enable each topic selected to be reviewed in depth. These capacity constraints mean that there may be marine topics which are not touched on in depth within this review as relevant literature was not found with the defined search terms (e.g. coastal erosion; tourism) or was deemed out of scope due to being a focus of other Governmental workstreams (e.g. oil and gas, carbon capture and storage). Learning from non-marine sectors (e.g. terrestrial community benefits and community ownership; agriculture) or from international literature has not therefore been included within this review. International insights on some topics are provided in the [international review](#).
- There are significant evidence gaps in the literature on a marine just transition. Only a handful of documents specifically frame the literature as focussing on a just transition, as research into a marine just transition is novel and a new area of interest. To manage these evidence gaps, it was decided that papers were selected if they focussed on a marine topic and its impact on people. Additionally, there were no or limited relevant papers identified through our literature searches (using the search terms in [Appendix A](#)) on key marine topics and a just transition in the UK such as aquaculture, coastal tourism and coastal erosion. This may be due to shortcomings in the search terms used or due to real gaps in the literature available, but subsequently these topics were scoped out of this review. Additionally, the available literature largely focussed on negative impacts, particularly associated with offshore renewable development. The majority of the available literature focusses on fishers, with less available on other marine and coastal stakeholders. Very limited literature is available that focusses on island communities. There are significant gaps around these topics in this review, perhaps due to a lack of research on the topics or due to the reviewers not being able to find this research. This should be considered when reading this review.
- This paper is orientated towards Scottish Government policy, and this is where the topic of a 'just transition' is most used in UK policy. The term 'just

transition' does not appear to be used often elsewhere in policy in the UK. Evidence gaps exist surrounding what other terms are used to cover similar topics across the United Kingdom.

- This literature review reviews published reports or policy documents (academic, government and Non-Governmental Organisation (NGO)), as outlined earlier in this methodology chapter. There is known to have been recent unpublished work on the topics covered in this review in Scotland and the UK which is yet to have been published or made publicly available. Consequently, there may be up-to-date information which this review does not include. This should be considered when reading the findings of this report. This report does not reflect current government policy activity or related workstreams. The policy statement released with this report highlights some examples of work the Scottish Government has done on these topics through recent years.
- As a result of the literature reviewed from the literature searches, this review is orientated towards negative impacts for coastal communities and marine sectors and how they can be mitigated towards a just transition. For instance, some of the evidence considered focused more on negative impacts of developments, particularly in relation to offshore renewables. This was in part due to the framing of the research questions, which were focussed on identifying areas where impacts can be made more just. This review does not highlight the broader impacts a transition to net zero and nature positive may have on the wider Scottish population in any depth as this is outside the scope of this work, which is focussed specifically on coastal communities and marine sectors.

1.4. Findings

The findings from this literature review are outlined in the subsequent four sections, framed around each research question.

1.4.1. What are the main changes that are likely to occur that affect coastal communities and marine sectors in the UK as we move towards biodiversity and climate change goals?

As Scotland and the rest of the UK take steps towards biodiversity and climate change goals, as well as the nation becoming increasingly subject to a changing climate, the evidence strongly suggests that a wide array of changes which may affect coastal communities and marine sectors are likely to occur. This section outlines impacts highlighted in the literature that will have a direct effect on marine sectors and coastal communities. It does not focus on impacts that might affect people who do not reside in these areas across the UK.

1.4.1.1. Climatic changes

Multiple studies indicate that environmental changes will affect coastal communities and marine sectors, as a changing climate and ocean acidification alters commercial fish species availability for fishers (MacNeill *et al.*, 2010; Thornborrow *et al.*, 2024). For example, if fish stocks change in response to climatic changes, they may therefore not match existing quotas and licenses, and these will therefore require updating over time to enable the adaptation of fishers (MacNeill *et al.*, 2010; Thornborrow *et al.*, 2024). More extreme weather conditions may affect the safety of those on and offshore and sea level rise and increased storm frequency may lead to greater coastal erosion (Famuditi *et al.*, 2018; Scottish Government, 2024a). Such changes may mean that coastal areas become - and indeed some already have become - more unpredictable and increasingly risky to live and work in (Famuditi *et al.*, 2018; Scottish Government, 2024a). This may result, and indeed already has resulted, in some of those making a living from the sea, or living near the sea, having to adjust their practices in order to cope with a changing climate (Famuditi *et al.*, 2018; Scottish Government, 2024a).

1.4.1.2. Declining oil and gas extraction

Although energy transitions are not the focus of this review, as they are covered by the Scottish Government's Draft Energy Strategy and Just Transition workstream (Scottish Government, 2023b), the oil and gas context is important for understanding the compounding impacts some coastal communities and marine sectors are facing in Scotland. Declining oil and gas extraction may have an impact on coastal communities and workers, especially in the North East of Scotland, where 28% of the UK's offshore energy workforce were based in 2022 (De Leeuw and Kim, 2022). Some of this employment may be transitioned into renewables sectors, where employment opportunities are currently growing, especially with the announcement that GB Energy, the UK Government's new energy body, will be based in Aberdeen (Marine Alliance for Science and Technology, 2021; Scottish Government, 2023b; Delaney and Porter, 2024). The Scottish Government aims to

maintain or increase employment in Scotland's energy sector, despite a decline in North Sea oil and gas production (Scottish Government, 2023b; Taylor *et al.*, 2024).

1.4.1.3. Increased offshore renewable development

Increased offshore renewable development is going to occur over the coming years and decades. Scotland has set ambitious renewable energy targets, aiming to significantly reduce its carbon emissions and transition to cleaner energy sources. These goals include plans to achieve net-zero carbon emissions by 2045, through substantially increasing the use of renewable energy relative to non-renewable energy sources (Scottish Government, 2023b). Offshore wind energy plays a crucial role in achieving these targets. In addition to the reduction in carbon, the growth of the renewables sector and its supply chains is likely to provide a range of economic benefits including the creation of high quality, green job opportunities (Scottish Government, 2017; 2024d; Withouck, 2023). Scottish Government evidence suggests Scotland's offshore wind sector could support 10,400 - 54,000 jobs across the country (Scottish Government, 2024d). Scotland is perceived in the literature to be a world-leader in the development of nascent offshore renewable technologies, including wave, tidal and floating offshore wind (Kerr *et al.*, 2015; O'Gorman *et al.*, 2024). Offshore renewable energy developments are therefore likely to be of growing importance to coastal communities and marine sectors in Scotland over the coming decades.

While the benefits of offshore renewables are clear for the Scottish population as a whole, some of the evidence considered in this review expressed that the development of offshore renewables may have positive and negative impacts on coastal communities and other marine sectors. Multiple sources consulted suggest that the development of renewables offshore could lead to, and is already leading to, competition for marine space between marine users and sectors, especially fishers, in Scottish and UK waters (Blyth-Skyrme, 2010; Schupp *et al.*, 2021). According to a study by Owusu Bonsu *et al.*, (2024), the UK has the greatest proportion of offshore wind area overlapping with fishing effort, with suitable areas for both often being in the same locations. Studies suggest that offshore renewable developments may also affect other coastal community members in positive and negative ways, with developments often visible from the shore, requiring onshore infrastructure, providing jobs and potentially affecting recreation and tourism (de Groot and Bailey, 2016; Boomsma *et al.*, 2020). The Scottish Government states that the energy transition should benefit local communities and workers, so this needs to be ensured in coastal areas (Scottish Government, 2023b).

1.4.1.4. Increased marine protection

The introduction of increased marine protection measures could benefit marine biodiversity and habitats and the Scottish population more broadly, but may have positive and negative impacts on coastal communities and marine sectors. Greater marine protection to preserve and conserve biodiversity, with the potential introduction of restrictions on activities in these areas, may restrict fisher access and renewable development in some areas of the sea, exacerbating competition for marine space (Yates, 2014; Vaughan, 2017; Birchenough *et al.*, 2020; Scottish

Government, 2022c). 24% of the UK's seas are already covered by MPAs (with 37% of Scotland's seas covered by the MPA network), but a limited number of these currently have restrictions on use of marine space (Rees *et al.*, 2020; Scottish Government, 2024e). Further marine protection measures, could bring greater restrictions than are already in place in seas in the UK, potentially limiting human use of the sea in some designated areas, although benefitting the environment (Benyon *et al.*, 2022). This could impact marine sectors and coastal communities.

1.4.1.5. Competition for marine space

As there are increasingly competing demands on marine space, increased potential competition for this space is likely to occur within and between marine sectors and interests (Shelmerdine *et al.*, 2017; Anbleyth-Evans, 2018; Greenhill *et al.*, 2021b; North Sea Advisory Council, 2021). Our seas are becoming much busier (Withouck, 2023), and marine spatial planning is likely to increasingly be needed to manage competing demands (Smith, 2018; Yates 2018). According to multiple researchers, static uses of the sea that require specified areas of sea space, such as for marine renewables development and aquaculture, are likely to impact access and usage rights to the sea by mobile activities such as fishing and shipping, as well as traditional access and usage rights of local communities (Kerr *et al.*, 2015; Johnson *et al.*, 2016; North Sea Advisory Council, 2021; Morgera, 2023). Competition for use of marine space is likely to be of increasing importance for marine planning and marine users in the coming decades.

1.4.1.6. Summary

With the changes detailed above - environmental changes, declines in oil and gas extraction and employment, growth in renewable development, and increased marine protection – changes are likely to occur to sea space use over the next few decades, which may affect marine sectors and coastal communities. In addition, other uses of marine areas, such as aquaculture, mineral mining, carbon capture and storage, tourism, dredging and shipping place additional pressure on marine spaces and people - although their impacts on people have been subject to limited research in the UK thus far. With a large range of compounding pressures on coastal communities and marine sectors, impacts on those residing near our seas are likely to be significant over the next few decades. Marine sectors and coastal communities are not homogenous, and indeed there is great diversity within the fishing industry, so people may be affected in different ways by these pressures. The next section of this report will provide a more detailed focus on how these communities are likely to be affected, with subsequent sections exploring how we can ensure a just transition for them.

1.4.2. How are coastal communities and marine sectors likely to be impacted by these changes in the UK?

This section focusses on how coastal communities and marine sectors specifically may be impacted by the changes - including impacts of offshore renewable development and impacts of increased marine protection - that are expected to occur as we move towards climate and biodiversity goals in Scotland and the UK. Although moving towards climate and biodiversity targets may benefit the Scottish population, this review focusses specifically on how coastal communities and marine sectors may be affected. It does not focus on impacts that might affect people who do not reside in these areas across the UK. The relatively high proportion of papers related to the impacts on fishers is a reflection of what most academic literature on marine sectors and coastal communities and just transition is focussed on in the UK to date. With the spotlight of this review being on a marine just transition, this review focusses predominantly on potential unfair impacts, and how they might be addressed. The impacts of increased marine protection and offshore renewable development on coastal communities and marine sectors, and environmental changes on fishers, is discussed in turn, with wider impacts such as spatial restrictions on fishing and the effect of a loss of fishing on coastal communities discussed subsequently. The impacts of a low level of trust and a lack of participation in decision-making regarding all of these changes are discussed at the end of this section.

1.4.2.1. Impacts of offshore renewable development on coastal communities and marine sectors

The potential economic and environmental benefits that offshore renewable development may bring has been clearly set out by the Scottish Government (Scottish Government, 2024d). However, the literature reviewed suggests that there may be positive and negative impacts of offshore renewables on coastal communities and on other marine sectors. Impacts to coastal communities and marine sectors directly include the provision of employment opportunities, visual effects, impacts of infrastructure on land, impacts on recreational access to the sea and effects on fishing. Offshore renewables development has created and is likely to continue to create significant employment opportunities in Scotland and the UK (Scottish Government, 2024d). The estimated number of people employed in offshore wind in Scotland has increased by 333% between 2014 and 2022, with an estimated 3,900 people employed in offshore wind in 2022 (Scottish Government, 2024c). Employment is expected to continue to rise in the sector and in its supply chains, with some evidence showing that Scotland's offshore wind sector could support as many as 10,400 - 54,000 jobs (Scottish Government, 2024d). The Scottish Government aims to maximise the economic benefit from offshore wind developments in Scottish waters, and to ensure that host communities share in their benefits (Scottish Government, 2020c). However, Withouck (2022) stresses that information about how job creation will specifically benefit coastal communities is at this stage uncertain.

Renewable developments offshore have to be connected to the land, meaning that infrastructure such as cabling and substations is often situated near communities that reside near the coast (Glasson, 2017). This can cause disruption to local communities during construction, maintenance and disposal of offshore installations (Glasson, 2020; Rudolph *et al.*, 2023). Depending on who owns the land that onshore infrastructure needs to fall in, negotiations could result in economic or access benefits or disadvantages for local landowners or communities (Kerr and Weir, 2017; Withouck, 2023). Infrastructure associated with offshore developments could result in improvements to infrastructure for local residents (e.g. improved roads, ports, facilities or connectivity) or could be perceived negatively by local communities if seen to be to the detriment or inconvenience of a local area (Withouck, 2022). Oil and gas booms could provide some insight to the impact of energy projects on local communities. Although benefitting some people, for instance those directly employed, they can result in others struggling with the cost of living as demand for housing increases or lead to negative impacts or inconvenience to those close to their infrastructure (Bennett *et al.*, 2021). Academics highlight that opponents of offshore wind developments also raise concerns about its visual effects, such as altering seascapes and contesting with flicker, impacting the character of a coastal area (Armeni, 2016; Bennett *et al.*, 2021; Withouck, 2023). However, Buchan (2024: page 10) has found that marine developments are generally “out of sight and therefore out of mind for communities on land”.

Offshore renewable development could impact tourism and recreation in a variety of ways. Offshore renewables could provide a new attraction to an area, with offshore windfarm visitor centres already created to attract tourists in some areas (e.g. in North Norfolk) (Glasson *et al.*, 2022a). Tourism may be positively affected by the creation of a new attraction or could be negatively impacted if visitors do not perceive windfarms and their impact on seascapes positively (Jones, 2002; Schultz-Zehden *et al.*, 2018; Bennett *et al.*, 2021; Glasson *et al.*, 2022a; Withouck, 2023). Tourism could also not be affected at all if offshore windfarms become more common and normalised (Glasson *et al.*, 2022a). Impacts on recreational use of the sea could occur, as offshore wind developments may limit available space, although these impacts are likely to be limited as offshore wind developments are usually further offshore than most recreational activities. However, there is limited data about these impacts (Glasson *et al.*, 2022a; Withouck, 2023). Offshore renewable developments have impacts on fishers, potentially both positively and negatively. For example, on the positive side, offshore fixed renewable developments may result in increased fish stocks, providing new ecosystems and nursery habitats, although there are evidence gaps surrounding how likely this might be for different species and developments (Mackinson *et al.*, 2006; Schultz-Zehden *et al.*, 2018; Withouck *et al.*, 2023). However, offshore renewable developments could reduce fishing grounds during construction and operation, which could result in a loss of fishers’ earnings, as it may restrict available space to fish and increase fishers’ time spent travelling to suitable fishing grounds (Mackinson *et al.*, 2006; Blyth-Skyrme, 2010; Alexander *et al.*, 2013; Withouck *et al.*, 2023).

New job opportunities could appear for fishers in renewable developments, for instance using fishing boats in guarding duties, inspecting devices, survey work, to move equipment or employing fishers as liaison officers, potentially providing another income stream for fishers (Alexander *et al.*, 2013; Haggett *et al.*, 2020; Withouck, 2022; Withouck *et al.*, 2023). Renewables could also present job opportunities when fishing is not available, such as due to seasonal fish patterns or quota restrictions (Withouck, 2022). However, opportunities may not be well matched in timing for fishers, with both fishing and offshore renewables construction likely to occur during calm sea conditions (Withouck *et al.*, 2023). It was mentioned in Reilly *et al.*, (2016) that often renewables developers are keen to employ local fishers, as they best know the local marine area. According to Withouck (2022), one offshore renewables project in Scotland spent £500,000 employing fishers as liaison officers or paying to use fishing boats for supportive work.

However, interviewees in Withouck (2022) did not believe that the jobs for fishers outlined in proposed energy projects would materialise. Many academics raise that there is uncertainty over how many jobs may become available compared to the number of jobs potentially lost in fishing, whether jobs would remain locally available, whether procurement could assure roles to fishers, and whether roles would be available long-term (Reilly *et al.*, 2016; Howell, 2019; Withouck, 2022; Withouck *et al.*, 2023). Additionally, fishing boats may also not be suitable for this work or would need expensive adaptations in order to comply with safety requirements (Alexander *et al.*, 2013; Reilly *et al.*, 2016). Withouck *et al.*, (2023) note that these employment opportunities in offshore developments are likely to only benefit a small number of fishers and be short-term, compared to long-term fishing losses.

Some fishers have successfully fished in offshore windfarms, with a study by Gray *et al.*, (2016) finding a small number of demersal trawlers fishing between turbines. The North Sea Advisory Council (2021) state there is evidence of static gear operating within offshore windfarms, but not conclusive levels of evidence about mobile gear. Offshore renewable developments can present insurance, liability and safety risks to fishers, such as expensive policies or an inability to get insurance cover, making them an unappealing place to fish (Mackinson *et al.*, 2006; Withouck *et al.*, 2023). There are differing opinions amongst developers, for instance, on whether fishers can fish, especially trawl, over laid subsea cables, for risk of damage to both developments and fishers (Blyth-Skyrme, 2010; Gray *et al.*, 2016; Withouck *et al.*, 2023). Fishers using static gear may also be concerned about safety and snagging risks, due to the difficulty in keeping creels in one location, and this becomes more complex with interactions with floating wind developments (Alexander *et al.*, 2013).

Withouck *et al.*, (2023) highlight that the ability and safety of fishers fishing within offshore windfarms is an area of ambiguity that needs to be addressed, with Owusu Bonsu *et al.*, (2024) claiming that the feasibility of fishing within renewable developments has not been sufficiently tested. The practicality of fishing being able to occur within offshore renewable developments is likely to be different for different fishing gear, and within different types of offshore renewable development. One

2023 study undertaken by the Scottish Government's Marine Directorate and commissioned by Equinor at Hywind Floating Offshore Wind Farm in Peterhead found that trial areas for the use of static commercial fishing gear allowed for the safe operation of static gear and sufficient room to manoeuvre for a 30m fishing vessel, however the commercial viability of these fishing methods was not within the project scope (Wright *et al.*, 2023). If fishers are unable to fish within offshore renewable developments, their available space to fish reduces, which could negatively affect their income. Co-location can act as a solution to reduce spatial competition for fishers and is discussed in the international review (see [2.4.4.1. Multi-use and co-location](#)).

1.4.2.2. Impacts of increased marine protection on coastal communities and marine sectors

The introduction of increased marine protection measures could also have positive and negative impacts on coastal communities and marine sectors, alongside their evident benefits to marine biodiversity and habitats and the Scottish population more broadly. Below, impacts on tourism, recreation and fishing are outlined.

Increasing marine protection is likely to have minimal impacts on access to the sea for marine tourism and recreation as most recreational activities are unlikely to be restricted by marine protection measures (Benyon *et al.*, 2022). Increased restrictions on fishing associated with increased marine protection could alternatively provide more space for a range of recreational activities. MPAs could also draw people to visit areas, encouraging tourism, as they may prove to be an attraction if wildlife numbers increase and more marine biodiversity is present (Jones, 2002; Scottish Government, 2019a). Schratzberger *et al.*, (2019) claim that areas with high levels of marine protection measures (e.g. restrictions on damaging or disturbing activities) could provide financial benefits due to tourism and recreation usage. In Lyme Bay on the south coast of England, three years post closure to trawling and dredging, recreation providers had increased their use of the MPA (Rees *et al.*, 2016). This has resulted in around a £2 million economic benefit per year to the total value of tourism and recreation in the area (Benyon *et al.*, 2022), although this does not consider alternative economic costs.

The introduction of fisheries management measures to protect the marine environment may limit where fishers can fish as certain forms, or all, of fishing may be restricted from areas (Shelmerdine *et al.*, 2017; Withouck *et al.*, 2023). Although spatial restrictions associated with marine protection may be perceived negatively by some fishers, others have encouraged their creation even when impinging on their own activities, showing that they can be highly valued by fishers, and may present improved opportunities for them (Yates, 2014; Brooker *et al.*, 2018). Research has suggested that fishing opportunities may improve on the edge of closed areas for renewables or marine protection, with closed areas potentially acting as an environmental reserve, presenting increased fishing opportunities (Withouck *et al.*, 2023). It is however the perception of some fishers that these positive effects are unlikely to be realised (Jones, 2008), with some academics claiming spillover effects are anecdotal and only apparent where stocks are very depleted (Schratzberger *et al.*, 2019). Uncertainty about whether measures will be

introduced in Scotland, and the effects of these, is already perceived by some academics to make fishing an unattractive industry for new crew, undermining job security and existing livelihoods (Alexander *et al.*, 2013; Greenhill *et al.*, 2021a).

Impacts of marine protection on the restriction of fishing are likely to be varied, with different impacts between different types of fishers likely to be evident. Small-scale fishers, stopped from fishing within MPAs, are more likely to experience negative impacts than those who work on a larger scale, as they find it more difficult or expensive to adapt to measures introduced, and find it harder to travel to new fishing areas further away due to the size of their boats (Benyon *et al.*, 2022). Marine protection measures resulting in the restriction of trawling from areas can provide more opportunities for static fishers, by restricting mobile gear. The displacement of mobile gear caused by the Lyme Bay MPA in England has had a negative effect on mobile and mixed gear fishers (and charter boats), however static gear fishers have benefitted from restrictions on trawlers as they are still allowed to fish in the area (Mangi *et al.*, 2011; Rees *et al.*, 2013). A Scottish Government (2019a) study of a MPA on the west coast of Scotland showed around one quarter of fishers had reduced landings since a MPA was designated. However, as shown in Lyme Bay where fisheries management measures associated with the MPA resulted in minimal changes to overall landings of the whole sector despite initial concern, concerns regarding falling fish hauls are not always realised (Mangi *et al.*, 2011; Rees *et al.*, 2013). Effects on fishing will depend heavily on the type of marine protection measure introduced and the type of fishers affected.

1.4.2.3. Environmental changes and fishing

Some of the literature reviewed emphasised that a changing climate and biodiversity crises may require the adaptation of fishers to changing stocks, with quotas and licenses potentially impacting on the ability of fishers to respond, and successfully adapt, to these changes (Thornborrow *et al.*, 2024). Environmental changes may alter where fish are located, with climate change and ocean acidification affecting both fish stocks and ecological community structure (MacNeill *et al.*, 2010; Thornborrow *et al.*, 2024). This could impact fisheries through losses in fish abundance and changes in available species, and one of the sources surveyed suggests that there is a risk of a mismatch with quotas granted based on historical records compared with what stocks are currently available (Thornborrow *et al.*, 2024). Quotas and license policy might negatively impact the ability of fishers to adapt and diversify in the face of climatic and other changes, if they do not keep up with the pace of change (MacNeill *et al.*, 2010). Impacts of quota policy on fishers may be compounded by wider economic and geographical impacts and make fishers more susceptible to any further impacts associated with marine development or protection (Jones, 2009; Scottish Government, 2019a; Weir, 2020).

1.4.2.4. The impact of spatial competition: displacement and diversification

Many academics highlight that spatial competition as a result of increased offshore renewable development or marine protection measures, could result in perceived

negative impacts for fishers as we move towards climate and biodiversity goals (Gray *et al.*, 2010; Kafas, 2017; Shelmerdine *et al.*, 2017; Marine Alliance for Science and Technology for Scotland, 2021; Scottish Government, 2022b). Spatial restrictions could result in increased competition for sea space between users, with some fishers and academics claiming that there is a 'spatial squeeze' occurring, and increasing, which is pushing fishers out of the seas (Cohen, 2019; Clarke, 2021; Withouck, 2023; Just Transition Commission, 2024). However, there are considerable evidence gaps surrounding this topic.

Some fishers are able to adjust to spatial competition, by displacing their actions to different fishing grounds or diversifying their practices. Displacement from usual fishing grounds due to marine protection or offshore renewables development can have a range of negative impacts on fishers. The knowledge of particular stocks and fishing areas that fishers have built up over generations may be lost if they have to move to new areas (Mackinson *et al.*, 2006). This may result in lower productivity and higher costs according to a range of academics, as fishers may struggle to find new stocks, and may have to travel further to find suitable fishing grounds, increasing time spent steaming, decreasing time available for fishing and increasing associated fuel costs (Mackinson *et al.*, 2006; Blyth-Skyrme, 2010; Alexander *et al.*, 2013; Kafas, 2017; Scottish Government, 2020d). There may also be additional safety concerns associated with displacement, as fishers may be pushed further offshore, leading to exposure to poorer weather conditions, and longer working times, which is especially risky for small-scale inshore boats (Ross, 2013; Vaughan, 2017). Greater competition in limited space could also lead to increased competition between fishers, which may reduce positive relationships in the industry (Mackinson *et al.*, 2006; Blyth-Skyrme, 2010; Scottish Government, 2020d). There is currently limited data available on fisheries displacement, with fishers often nervous to share their fishing locations publicly (de Groot *et al.*, 2014; Vaughan, 2017; Yates, 2018).

Fishers may also diversify into using different gear types or targeting different species as a result of restrictions in MPAs or spatial competition with offshore renewables developments (Vaughan, 2017). A Scottish Government report in 2019 found that ports near MPAs on the west coast of Scotland showed increased employment in static gear vessels and a decrease in trawl and dredging vessels – which could suggest a switch to static gear in reaction to marine protection measures, although other factors may have also had an influence (Scottish Government, 2019a). Diversification was also evident amongst fishers in other ways in the Scottish Government (2019a) report, with some changing grounds or changing boats, which helped to maintain fishing businesses. This however is to the cost and inconvenience of fishers and can cause new pressures on the environment (Mackinson *et al.*, 2006; Scottish Government, 2019a). Opportunities to fish in other ways may also be limited due to fish availability, oversubscription by other fishers, or limits in quotas, licensing, costs or gear availability (Mackinson *et al.*, 2006). Increased costs associated with diversification (or displacement) could reduce the profitability of the fishing industry and its adaptive capacity, reducing resilience to additional pressures and resulting in people moving out of the industry (Vaughan, 2017). Larger-scale fishers may have more flexibility in their fishing

practices, whereas small-scale fishers may have smaller buffers in their income, smaller areas they can work in and smaller vessels, and may find it harder to diversify when competing with larger economic interests (Bennett *et al.*, 2021; Evans *et al.*, 2023; Gill *et al.*, 2023; Gray *et al.*, 2023).

Fishers may also choose to diversify into other sectors, and indeed some fishers already work in multiple industries so their income is not solely reliant on fishing (Jones *et al.*, 2014). For instance, fishers could host tourists, hosting angling or diving trips, wildlife tours or visiting renewable development sites or aquaculture infrastructure (Schultz-Zehden *et al.*, 2018). However, there are concerns that safety requirements of vessels would not be sufficient to host tourists, and that fishers may not have the experience nor want to provide these opportunities (Schultz-Zehden *et al.*, 2018). Other opportunities in marine sectors may include fishers becoming part of the merchant navy, aquaculture or supporting offshore energy (Jones *et al.*, 2014). Fishers in Alexander *et al.*, 's (2013) study suggested that jobs as boat crew or fish farm crew would be most suited to them as means of alternative employment.

Fishers may also choose to leave fishing entirely. Skills shortages may however affect the ability of fishers to transfer to new industries (Alexander *et al.*, 2013; Howell, 2019; Reilly *et al.*, 2016). Fishers often feel deeply attached to the fishing industry with some fishers highlighting that they simply do not want to do anything else, and therefore alternative employment may not be seen as an option (Ross, 2013). Some academics highlight that taking away the right of the public to fish anywhere may be seen to threaten a fundamental human right, with fishers having historical access to the seas (Johnson *et al.*, 2016; Bennett *et al.*, 2021). According to some academics, restricting fishing may also be perceived as destroying a way of life, rather than simply taking away a way to earn a living (Jones, 2009; Weir, 2020). Families may have fished for generations, passing skills and traditions through families (Brooker *et al.*, 2018). Fishing can be ingrained in coastal communities, with the impacts of this further discussed in [1.4.2.5. Impacts of changes and a loss of fishing on coastal communities](#). Fishers needing to move out of the fishing industry and into alternative jobs may therefore be met with high levels of resistance (Ross, 2013).

1.4.2.5. Impacts of changes and a loss of fishing on coastal communities

Coastal communities may have cultural, historical and social connections to the sea, and offshore renewable developments or changes in marine protection may not be welcomed (Bennett *et al.*, 2021). Some academics highlight that some people value the sea as a 'wild' space, that nobody owns, and a place where human structures do not belong, although others may have conflicting views on what the sea represents and should be used for (Boomsma *et al.*, 2020; Bennett *et al.*, 2021). When the Burbo Bank offshore windfarm was proposed to be extended, opponents expressed concerns that the windfarm would change the character of the heritage of the area (Armeni, 2016). Offshore renewable development could therefore lead to valuable ecosystem services being perceived to be lost. Marine protection could help enhance cultural connections to the sea and enhance environmental protection (Benyon *et al.*, 2022). The Benyon Report (2022)

concludes that HPMAs could help to enhance non-use values associated with the sea, including aesthetic, educational, cultural and spiritual ecosystem services. Knowing that marine environments are protected can help to improve human wellbeing simply due to its existence (Benyon *et al.*, 2022). MPAs off the west coast of Scotland have been shown to increase educational and community opportunities, improving connections to the sea, and providing opportunities for citizen science (Scottish Government, 2019a).

If a loss of fishing activity does occur, due to the changes expected as we move towards climate and biodiversity goals, this could cause considerable effects on coastal communities (Jones, 2009; Brooker *et al.*, 2018; Haggett *et al.*, 2020; Korda *et al.*, 2021). In coastal areas, fishing may be ingrained in the local area, with a large proportion of local people either working in fishing itself, or associated processing and supporting industries, having family connections to fishing or valuing the fishing heritage in the area. Changes to fishing due to marine protection or renewable developments may affect the feel of coastal areas and may also have wider economic impacts than just on those who are directly employed in fishing-related industries. According to multiple academics, threatening fishing may impact upon the culture and heritage of coastal communities (Jones, 2009; Brooker *et al.*, 2018; Haggett *et al.*, 2020; Korda *et al.*, 2021). Other researchers highlight that reducing fishing may result in significant changes in coastal areas (Mackinson *et al.*, 2006; Jones *et al.*, 2014; Brooker *et al.*, 2018; Weir, 2020; Withouck, 2022). Physical buildings associated with fishing may strengthen a sense of place, contributing to its character, acting as a sticking point for community cohesion and even acting as an attraction into the area (Brooker *et al.*, 2018). Interpersonal relationships are important in fisheries and declines in fishing may therefore affect a community's dynamics (Ross, 2013). The case study of Fraserburgh below highlights how a community can be affected by a loss of fishing.

Fraserburgh (Ross, 2013)

Ross' 2013 study found that people depend on the fishing industry in Fraserburgh for more than employment and income.

Strong interpersonal relationships are necessary for the fishing industry to thrive, and businesses on shore benefit from fishing – being part of a 'chain' of networks is recognised by those involved in fishing – including fish processing workers, vessel specialists and shops that sell food and boat supplies.

Although Fraserburgh may be dependent on fisheries income, dependency is also apparent on the traditional way of life and cultural connections to the sector. Even those who did not work in fishing in Fraserburgh, but were born in the town, were classed as part of the 'fishing community', showing that dependency goes beyond being involved in fishing directly.

A decline in fishing would also be likely to have monetary impacts on coastal communities, especially in remote and rural areas (Greenhill *et al.*, 2021a). In coastal areas with a high proportion of employment either directly or indirectly in fishing, areas may be classed as fishing dependent (Jones *et al.*, 2014). The

income provided by fishing may help to support many local businesses, with fishing institutionalised in the local economy (Mackinson *et al.*, 2006; Withouck, 2022). Processors, gear manufacturers, ship chandlers, salesmen and accountants, as well as businesses such as food providers or shops could be affected (Alexander *et al.*, 2013; Withouck, 2022). Restrictions on fishing practices may therefore present a threat to the local economy and local wellbeing (Ross, 2013).

According to Korda *et al.*, (2021) a chain reaction could occur, with lower economic value of fishing in the local economy, people may have to move away from coastal areas to find alternative employment, and this could lead to some coastal communities depopulating or experiencing increased deprivation. In some Scottish islands, for instance, where the fishing industry often dominates a larger proportion of the economy, spatial competition could make living on islands increasingly unviable, with respondents in Alexander *et al.*, (2013) claiming this could cause 'island clearances'. Jones *et al.*, (2014) however claim that historically perceived 'fishing dependent communities' are in fact increasingly dependent on other sectors, with fishing now only representing a small proportion of employment in these areas. Economic impacts could therefore be limited in some coastal communities (Jones *et al.*, 2014).

New industries such as offshore renewables or marine tourism opportunities are already presenting new job opportunities - employment was up in the marine renewables sector by 333% between 2014 and 2022 (Scottish Government, 2024c). Some jobs are expected or already present in remote and rural areas, where jobs are often scarce (Rudolph, 2017; Schultz-Zehden *et al.*, 2018; Withouck, 2022; Withouck, 2023; O'Gorman *et al.*, 2024; Scottish Government, 2024d). Although new jobs may be viewed as a beneficial impact for remote and rural areas, this depends on whether the jobs match available skills in local communities, whether workers want to fulfil them, or whether new workers would have to move into the area (Marine Alliance for Science and Technology for Scotland, 2021; O'Gorman *et al.*, 2024). This could result in more people moving to these areas, which could have a range of positive and negative impacts (e.g. on infrastructure, house prices and community cohesion). Oil and gas jobs are likely to decline over the coming years, and if the transition to renewables and other industries is not well planned, this could present significant problems for communities, especially in the North East of Scotland (Marine Alliance for Science and Technology for Scotland, 2021). Evans *et al.*, (2023) suggest that a trickle-down from ocean-based economic growth to local communities is not likely, with the extent local employment will be impacted still up for debate.

1.4.2.6. The impact of a low level of trust and participation in decision-making

It is evident in the literature that there is a perception that coastal communities and fishers have historically had low participation in marine governance, and that this is leading to low levels of trust in decision-making, especially where outcomes for coastal communities and marine sectors are perceived to be negative (Fletcher *et al.*, 2013; Padda, 2019; Korda *et al.*, 2021). It is noted that the majority of sources focused on engagement and participation highlight issues occurring in England,

with less literature available focussed on Scotland or other UK nations. Withouck *et al.*, (2023) have also highlighted perceived improvements to fisher engagement in offshore renewable developments in Scotland in recent years. Further information about recent work of the Scottish Government to embed active stakeholder participation into policymaking (e.g. in marine protection and in developing National Marine Plan 2 (NMP2)) is provided in the accompanying policy statement.

According to academics such as Fletcher *et al.*, (2013) coastal communities have historically been under-represented in marine governance in the UK. Local communities are less politically powerful than other stakeholders with louder voices (or bigger economic actors) and therefore can be marginalised from decision-making (Evans *et al.*, 2023; Gill *et al.*, 2023). Not including local communities in decision-making can present a risk to a just transition and can lead to social and cultural contexts being ignored through top-down decision-making (Bennett *et al.*, 2021). Changes to local coastal and marine management without local community input can lead to disenfranchisement (Famuditi *et al.*, 2018). Greenhill *et al.*, (2021b) state that there is not a consistent model for community participation in marine management in Scotland.

The literature also highlights a general perception of low fisher participation in decision-making. More restrictions on fishers' actions are often seen as inevitable by fishers and academics, with national targets for renewables or biodiversity protection prioritised by the UK and Scottish Governments, making fishers feel that they are unlikely to compete with these policy demands (Gray *et al.*, 2010; Haggett *et al.*, 2020; Withouck, 2022; Withouck *et al.*, 2023; Shucksmith and Withouck, 2024). Many academics in England have found that fishers often feel that the UK Government (or developers) are making decisions about their livelihoods without consulting them and to the expense of their incomes (Fletcher *et al.*, 2013; Padda, 2019; Korda *et al.*, 2021; Schéré *et al.*, 2021). Even where participation opportunities are provided, resource (human, financial and political) constraints can stop fishers (especially small-scale fishers) from participating in decision-making (Johnson *et al.*, 2016; Bakker *et al.*, 2019; Clarke, 2021; Withouck *et al.*, 2023). This can lead to less informed decisions being made, as local knowledge and experiences is not included in decision-making (Korda *et al.*, 2021; Withouck, 2022). It is also easy for local decision-making to be dominated by individual loud voices, or be influenced by dominant groups, which can make fair representation of all different types of fishers difficult. According to the literature, those with less power (e.g. small-scale fishers) are less likely to have their voices heard (Rees *et al.*, 2013; Gill *et al.*, 2023; Gray *et al.*, 2023). Korda *et al.*, (2021) suggest that the lack of quota for the small-scale sector in England is a symptom of this lack of equal voice.

Academics such as Dixon *et al.*, (2024) have found low levels of trust in fisheries governance by fishers and fisheries governance institutions in England. Fishers mistrust in decision-making is believed to be related to previous negative experiences, and the recent experience with a perceived lack of consultation and collaboration surrounding the Highly Protected Marine Area (HPMA) proposals in Scotland may have further reduced levels of trust in decision-making (Haggett *et al.*, 2020; Scottish Government, 2023d). Sometimes, even when fishers are

consulted, they feel that their input is ignored, with preconceived decisions already having been made, undermining their trust (Mackinson *et al.*, 2006). Lack of trust is also perceived to be evident regarding the science used to guide decision-making in England, highlighting the need for fisher local knowledge to be included (Korda *et al.*, 2021). All of these factors combined can make fishers feel unheard, reducing their trust and participation in the decision-making process, leading to less informed policies and greater disenfranchisement with policymaking. If this continues, this will not enable a just transition to take place.

1.4.3. What has already been done to limit negative impacts on coastal communities and marine sectors in the UK?

Policymakers, developers and non-profit organisations in the UK are already involved in limiting negative impacts and increasing positive impacts on coastal communities and marine sectors due to changes towards environmental and biodiversity goals. This section focusses on four main areas where work has been undertaken in the UK to increase positive impacts and reduce potential negative impacts: engagement, participation and co-management; community benefits; co-location and fisheries compensation. There is known to be recent additional work in this area that this review does not cover, as this literature is yet to be made publicly available. This should be considered when reading this review.

1.4.3.1. Engagement, participation and co-management

More inclusive decision-making is desired by the Scottish Government (Scottish Government, 2023e). According to the literature, enabling and facilitating engagement and participation of marine sectors and coastal communities can help to improve marine decision-making, by including local voices to better understand local coastal contexts and aid more inclusive decision-making (Kelly *et al.*, 2014; Yates, 2014; Rudolph, 2017; Haggett *et al.*, 2020; Gill *et al.*, 2023). This can help to increase trust in decision-making processes and lead to decisions that may have greater buy-in and be better respected by stakeholders (Scottish Government, 2023e). The Scottish Government has a vision for the public to be able to participate in decisions that affect them, including that meaningful participation opportunities should be created (Scottish Government, 2024f). Scotland's National Adaptation Plan commits to working in partnership with marine sectors and coastal communities to support an effective just transition for these stakeholders (Scottish Government, 2024a). The Just Transition Commission have highlighted how important building trust is for those working in the marine environment (Just Transition Commission, 2024). This section provides some overall reflections on past engagement opportunities for fishers and the public, and details examples of engagement and co-management initiatives that have already occurred within the context of marine policy or development in the UK: specifically in marine spatial planning; participation in offshore renewable developments; and co-management.

In the literature consulted it has been suggested that some fisheries representatives have felt overwhelmed with consultation requests, and that the associated costs of participating in engagement activities (e.g. through lost fishing time and therefore potential income) for fishers and their representatives can lead to low levels of participation (Yates, 2018). Often it is those with the most capital who are able to participate most strongly in these processes – meaning that less resource-rich voices can be left unheard (Clarke, 2021). Concerns have been raised by Ritchie and Ellis (2010) and Yates (2018) at the quality and accessibility of engagement processes, for the public, fishers and other stakeholders in governmental decisions in the UK. Approaches which involve only speaking to local chairs or only consulting online are not inclusive and can lead to voices being left unheard (Korda *et al.*, 2021). Smith (2018) highlights that it is often perceived that participation occurs too late, once decisions have already been made, or that too

much participation is required, leading to stakeholder fatigue. Meaningful participation needs to take place in fisheries decision-making, as cosmetic ‘lip-service’ can undermine trust (Gray *et al.*, 2010; de Groot *et al.*, 2014; Haggett *et al.*, 2020; Korda *et al.*, 2021). Many fishers feel that they are not given enough opportunities to participate in marine management which can lead to their alienation and lack of support for policies which are put in place (Yates, 2014).

1.4.3.1.1. Marine spatial planning

Marine spatial planning (or marine planning) is one example in which many stakeholders, such as fishers, conservationists and developers, can participate in managing the sea. The aim of marine spatial planning is to achieve sustainable development, balancing competing interests including minimising impacts on the marine environment (Scottish Government, 2024g). Marine spatial planning is a public process used internationally and should involve the participation of all interested stakeholders (Intergovernmental Oceanographic Commission, 2024).

Marine spatial planning processes have historically been criticised in Scotland by some academics for having minimal public engagement, due to unsuitable or limited engagement opportunities, a lack of stakeholder interest in engaging or other barriers to participation (Johnson *et al.*, 2016; Bakker *et al.*, 2019). According to Clarke (2021), those stakeholders with greater resources (e.g. developers) can often have a louder voice in these processes than the public or fishers, and often these better resourced stakeholders find it easiest to participate due to fewer resource constraints (Bakker *et al.*, 2019). Smith (2018) highlighted that participants have historically not been included early enough in the marine spatial planning process in Scotland, meaning they are not involved in initial idea creation. Past approaches to participation in marine spatial planning in Scotland have been criticised by Smith (2018) and Clarke and Flannery (2019: 16) as ‘tokenistic’. The participatory nature of marine spatial planning can be challenging as broad participation is time consuming and expensive, contrasting with the need to efficiently produce plans (Fletcher *et al.*, 2013; Yates, 2018). Interviewees in Clarke (2021) highlighted an example of a marine spatial plan in England disappearing from public viewing after consultation and returning completely different many months later, undermining wider participatory actions. Yates (2018) argued that inadequate participation of stakeholders can cause marine spatial planning to fail.

There has been recent work in Scotland to enhance engagement and meaningful participation in marine spatial planning particularly through the development of Scotland’s NMP2 (Scottish Government, 2024h; 2024i). Recent Scottish Government policy publications detail how the development of NMP2 is and will continue to be supported by a programme of inclusive stakeholder engagement, demonstrating learning from previous experiences (Scottish Government, 2024h; 2024i). The stakeholder engagement involved in this work has yet to be completed or evaluated. More details are provided in the accompanying policy statement.

1.4.3.1.2. Offshore renewable developments and fishers

Some level of stakeholder engagement and participation takes place during offshore renewables developments, although Buchan (2024) highlight that developer motivation to complete engagement is often limited to corporate environmental and social governance obligations and regulatory requirements. Withouck *et al.*, (2023) believe that over time the level of engagement of the fishing industry in offshore renewables developments has improved, especially since the implementation of the National Marine Plan in Scotland (Scottish Government, 2015). Fishers' involvement in design of developments from an early stage, e.g. surrounding spacing of turbines or coverage of cables, can help mitigate future issues once developments are built (Mackinson *et al.*, 2006; Haggett *et al.*, 2020; Withouck *et al.*, 2023). License conditions have historically required offshore renewables developers to form a Commercial Fisheries Working Group, to have fishers and the developer around a table throughout a windfarm's lifecycle about once every six months, with more regular informal smaller meetings also beneficial (Withouck, 2022; Withouck *et al.*, 2023). These groups are only usually formed where a license has been granted and when it is a stipulated requirement of the license - they are known to exist within the Tay and Forth, and Moray regions (Withouck, 2022).

The Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW) (see case study below) is a group which has been formed to help improve communication between fishers and offshore renewables developers (de Groot *et al.*, 2014; FLOWW, 2015; Schultz-Zehden *et al.*, 2018; Haggett *et al.*, 2020). FLOWW (2015) recommends that developers should employ Fishing Liaison Officers to communicate between developers and fishers. Fishing Liaison Officers are frequently mentioned in the literature as being of benefit to facilitate engagement (Haggett *et al.*, 2020; Withouck *et al.*, 2023). Fisheries Liaison Officers nominated by the fishing industry but appointed by windfarm developers can increase trust in these representatives (Blyth-Skyrme, 2010). Fishers might be more receptive of advocates who are also fishers (Yates, 2014). FLOWW (2015) recommends finding a suitable fisher to act as a Fishing Industry Representative to work alongside a Fishing Liaison Officer.

FLOWW – Fisheries Liaison with Offshore Wind and Wet Renewables Group (FLOWW, 2014; 2015)

FLOWW was established in 2002 to foster good relations and develop best practice guidance and communication between renewables developers and fishers. It is funded by the Crown Estate and consists of fisheries groups, renewables developers, government agencies, the Crown Estate and consultants.

FLOWW has produced a variety of best practice guidance. It provides information on managing contacts, fisheries liaison, guard vessels, information regarding construction and maintenance, assisting fishers, compensation and community funds, dealing with entangled fishing gear and dealing with claims for lost or damaged gear.

1.4.3.1.3. Co-management

One step further than increasing and improving participation opportunities, is enabling co-management. Co-management in Scotland (shared responsibility for management and delivery of management with stakeholders, whilst respecting the accountability of Scottish Ministers) can help fishers to have a greater role in decision-making, where fishers and regulators work in partnership to sustainably manage fish stocks or biodiversity (Jones, 2009; Scottish Government, 2024j). Scotland's Fisheries Management Strategy 2020 - 2030 commits to strengthening co-management groups including the Regional Inshore Fisheries Groups (RIFGs) to develop local projects and attain buy-in from the fishing industry (Scottish Government, 2020b).

Co-management can help fishers to have a greater role in decision-making, where fishers and regulators work in partnership to sustainably manage fish stocks or manage biodiversity (Jones, 2009). The Scottish Government has committed to the principle of co-management in Scotland's fisheries (Scottish Government, 2020b), with fisheries stakeholders and governmental officials working together to make key decisions for fisheries management, however the Scottish Government has recognised that co-management needs further strengthening to work effectively (Scottish Government, 2020b). RIFGs aim to facilitate co-management of Scottish seas, to enable fishers to be consulted on topics related to fisheries, streamlining engagement, to help ensure local understandings are included in decisions, and to encourage buy-in to decisions (Haggett *et al.*, 2020; Weir, 2020; Thornborrow *et al.*, 2024). It was recognised in Withouck *et al.*, (2023) that not all fishers are aware of RIFGs existence, so it is evident not all fishers are able to feed in through this co-management process. The Scottish Government have previously stated that they wish to strengthen the role of RIFGs to deliver local fishery management (Scottish Government, 2020b), although inshore fisheries management is currently under review by the Scottish Government (Scottish Government, 2024j).

These examples highlight that although attempts have been put in place to ensure fisher (and other community member) participation in the management of marine space, there is much space for improvement to help facilitate more inclusive participatory processes and to enable co-management to occur.

1.4.3.2. Community benefits

Community benefit schemes generally provide contributions from the developer to the community local to a development (Armeni, 2016). Community benefit schemes can help to recognise and empower host communities, enhance positive impacts, and potentially boost local acceptance of developments (Howell, 2019; Glasson, 2020; Rudolph *et al.*, 2023). There is no legal obligation for developers to provide community benefit schemes in the UK, and consequently schemes are developed outside of the licensing and planning process, so that they do not impact these decisions (Scottish Government, 2018b; Rudolph *et al.*, 2023). However, the Scottish Government's Good Practice Principles for Community Benefits from Offshore Renewable Energy Developments provide guidance in relation to shaping community benefits from offshore energy production (see case study below)

(Scottish Government, 2018b). A consultation is currently being undertaken by the Scottish Government on community benefits for net zero energy developments, to review these Good Practice Principles (Scottish Government, 2024k).

Community benefit schemes are the norm for onshore wind developments in the UK, but for offshore wind developments, arrangements are more ad-hoc and some developers pay no community benefits at all (Kerr and Weir, 2017; Boomsma *et al.*, 2020; Rudolph *et al.*, 2023). Boomsma *et al.*, (2020) claim that this may be explained by offshore wind being in its relative infancy compared to onshore developments, and potential harms to communities perceived to be lower. According to Rudolph (2017) some developers may feel that the uncertain nature of financing surrounding offshore windfarms makes them cautious to support community benefit funding, with the Contracts for Difference framework pushing for cheaper energy and potentially dissuading developers from being able to support community benefits. There is also difficulty in defining eligible communities for benefits from offshore developments (Boomsma *et al.*, 2020). Offshore windfarms often have wider geographical dispersal of benefits than onshore windfarms (Glasson, 2020).

Scottish Government's Good Practice Principles for Community Benefits from Offshore Renewable Energy Developments (Scottish Government, 2018b; 2024k)

The Scottish Government has produced a document outlining good practice guidance for community benefits from offshore renewables. It is currently in the process of updating this document, with this under public consultation. These guidelines are set to reflect the early-stage nature of the offshore wind industry and the financial sensitivities surrounding this.

Developers are recommended to undertake an initial study to understand the geographical area that should benefit from a development and identify appropriate contacts within this area, before the public are consulted. Thought should be given as to where community benefits should be focussed and how they should be delivered, and this should be designed with the local community. The guidance suggests a wide range of options that community funds could benefit and details the different types of benefits offshore developments could fund.

Community benefit funds are considered fundamental components of benefit packages. It is highlighted that these should be dealt with separately to compensation and that any benefits are dependent on the financial means of the developer.

Community benefits associated with offshore wind can include community funds, visitor centres, local infrastructure, environmental activities, affordable housing, training schemes, discounts on utilities, profit sharing, or can include fisheries funds (community benefits are also covered in the [international review](#)) (Armeni, 2016; Glasson, 2017; Kerr and Weir, 2017; Rudolph *et al.*, 2023). Some windfarms close to the shore in England have benefits per MW (e.g. North Hoyle), but in most cases community benefits offshore are ad-hoc, vary considerably and are usually lower

than onshore (Glasson, 2017; Glasson, 2022b). Glasson (2020) found that offshore projects in the UK most commonly offer around £250 per MW per year, although some pay from £500 per MW per year up to £1500 per MW per year. Comparably, the onshore norm is £5000 per MW per year (Glasson, 2020). There is some evidence that community-wide benefits are perceived more positively by communities/ local residents than individualistic benefits (such as money off energy bills) (Walker *et al.*, 2014; Glasson *et al.*, 2022b).

According to Glasson's (2020) study, around two thirds of offshore wind developments in operation or under construction propose to establish annual community benefit funds - this is the most common form of funding (Rudolph *et al.*, 2023). Some funds include direct funds to benefit those living nearby, but others may go into a more centralised pot (e.g. for a local authority area) (Glasson, 2017). Who is in charge of managing a community fund, and how they are distributed, can be a contentious issue, as they can involve large amounts of money over a long period of time (Glasson, 2017). Often the developer chooses who and what benefits from community benefit funding, rather than engaging the local community in this decision (Kerr and Weir, 2017). However, Glasson (2020) and the Scottish Government guidance (2018a) have highlighted the importance of involving local communities in the process of developing community benefit schemes, to ensure they most benefit the community who receives them. The establishment of community benefits in Aberdeen for the European Offshore Wind Deployment Centre involved early engagement with the local authority and community councils well before construction of the project, which was supported through a community liaison officer, meaning that benefits could be designed to meet the wants of the local community and were positively received (Glasson, 2020).

Below, a selection of case studies provide examples of some of the forms of community benefits (through community funds) which have been provided from offshore wind developments in the UK to date. In the international literature review, examples of community benefit practices in other nations are outlined (see [2.4.1.1. Community benefits schemes](#)).

Burbo Bank Extension Community Fund (Armeni, 2016)

A 25-year fund was established with the development of the Burbo Bank Extension offshore windfarm in Liverpool Bay. This fund provides up to £225,000 per year to nearby community groups and organisations. The fund is administrated by a national grantmaking charity, GrantScape, and is supported by local councils through an advisory group. The communities benefitting from this fund are those that are situated within 5km of the nearby coast.

The community were consulted on how a fund should be established, where should be funded, and the types of projects and size of grants which could be provided. This took place through a couple of rounds of consultation, including a survey and public exhibitions.

Projects funded include community buildings, environmental projects, open space enhancements, coastal improvements, community and social enterprise projects, and any other community project which may benefit the local area.

East Coast Community Fund (Glasson, 2020)

The East Coast Community Fund was set up to ensure local benefits associated with the operation of the Hornsea (1.2GW) and Race Bank (580MW) windfarms, off the east coast of England (Yorkshire, Lincolnshire, North Norfolk). Public consultation took place to decide which areas should benefit from the fund. The first applications for the fund were in 2017.

The Fund distributes around £465,000 per year over 20 years, supporting local community and environmental initiatives. £75,000 per year is reserved for a skills fund. Over 20 years, £9.3 million will be provided to the fund – averaging £265 per MW per year. The fund is managed by a UK community fund administrator called GrantScape.

Grants from £1000 to £50,000 are available from the fund. These are available for: community buildings and facilities; community activities and services; environment and open space projects; and sports, recreation and play facilities. Eligible organisations include voluntary and community groups, charities, parish and town councils and local authorities. Funding has gone to support the replacement of old equipment for a local bowls club; improvements to disabled beach access; to refurbish a toilet block; to support a soup kitchen; to provide technology to an after school club; and to support homeless young people (and to many more projects).

The Beatrice Community Benefits Fund (Glasson, 2020)

The Beatrice Community Benefits Fund, associated with the Beatrice Offshore Wind Farm (558MW) off Caithness, was agreed in consultation with Highland Council and Moray Council, using the Scottish Government's Good Practice Principles. The Fund became operational in 2017, ahead of the 2020 completion of the windfarm.

The Fund promises £300,000 per year over 20 years, totalling £6 million (this is an average of £500 per MW per year). The fund is split between the council areas of Highland and Moray, with two thirds going to the Highland area. The money is divided into a Local Fund for each area affected, to support community organisations from the local area, and to the Beatrice Partnership Fund, which has a broader reach. Projects apply for the funding and must fit one of three themes: creating opportunities, empowering communities and building sustainable places. An independent panel decides the allocation of the Partnership Fund.

Money has been used for projects such as renovating an old schoolhouse as a community hub and supporting the Scottish Dolphin Centre.

1.4.3.3. Fisheries Compensation

According to Withouck *et al.*, (2023), when considering impacts of development of offshore wind on fishing, and mitigations of these impacts, compensation of fishers should be at the bottom of the mitigation hierarchy, where avoiding impacts (e.g. by changing designs during the pre-application process) or minimising impacts (for instance by avoiding construction during fish spawning seasons or communicating in advance of construction activities) are to be sought first (see Figure 1) (Withouck, 2022; Withouck *et al.*, 2023). Compensation should aim to limit residual impacts according to Withouck *et al.*, (2023).

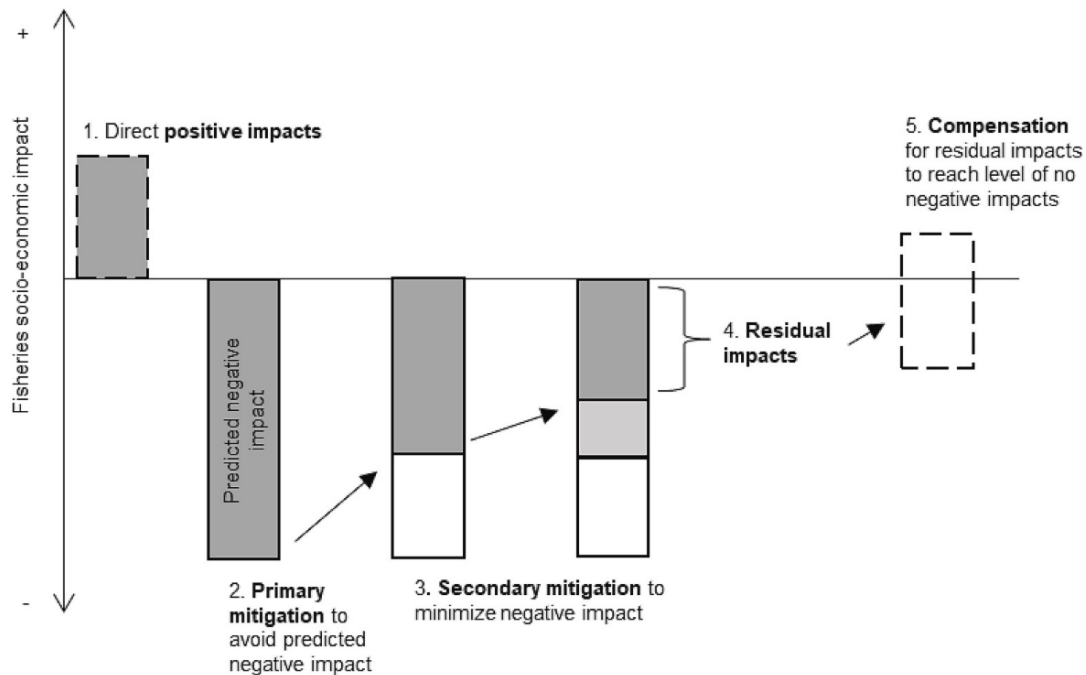


Figure 1. Mitigation hierarchy (Withouck *et al.*, 2023)

Some fishers have called for compensation where there has been disruption to their fishing activities (Reilly *et al.*, 2016; Haggett *et al.*, 2020). Indeed, in some areas a precedent for compensation has been set by the oil and gas industry, setting expectations that losses to fishers will be paid for (Reilly *et al.*, 2016). Withouck *et al.*, (2023) highlight that Scottish legislation in particular does not obligate offshore renewable developers to compensate fishers (or shipping) for impacts on them. FLOWW (2015) states that fishers should neither be advantaged or disadvantages by offshore renewable developments. According to academics such as Blyth-Skryme (2010) and Reilly *et al.*, (2016) any mitigations or compensation need to be cost-effective for developers, with the economics of delivering compensation for fishers potentially more difficult for offshore renewables than for the oil and gas industry due to greater economic constraints and higher degrees of uncertainty.

Compensation could take the form of payments to fishers directly (e.g. disruption settlements) or to a group of fishers through a fishers' community fund (which could be used to provide communal resources such as tractors for vessel launching, storage facilities or life-saving equipment, a fuel cooperative, undertake research)

(Gray *et al.*, 2016; Haggett *et al.*, 2020; Withouck, 2022; Withouck *et al.*, 2023). Disruption settlements tend to be for short term disruption (for instance paying when construction means creels have to be removed) and therefore do not provide long-term monetary relief, whereas fishers' community funds tend to provide longer term benefits (Blyth-Skyrme, 2010; Reilly *et al.*, 2016). Some fishers prefer the idea of direct settlement, whilst others are more supportive of shared funds or nationwide initiatives which can benefit a wider number of fishers (Withouck *et al.*, 2023). No single approach to compensation is likely to work in every area, as different types of fishers and different restrictions on their actions will likely have different impacts on fishers' ability to fish, requiring compensation (FLOWW, 2015). The below case studies provide some examples of fishers' community funds.

Thanet Fisheries Association Fuel Fund (Reilly *et al.*, 2016)

The Thanet Fisheries Association Fuel Fund is a novel form of compensation provided by a renewable developer. Thanet Fisheries Association set up a fuel company, with the local renewables developer setting up a contract to buy fuel from them.

This was perceived to be a successful fishers' benefit scheme, that helped fishers to buy fuel cheaply and helped to pay for improvements to the harbour and employ fishers. It enables fishers to benefit from the offshore windfarm throughout the operation of the development. It has led to better fisher perceptions of the windfarm.

West of Morecambe Fisheries Ltd Fund (Withouck, 2022)

The West of Morecambe Fisheries Ltd Fund was a non-profit company organised to help manage funding provided by an offshore windfarm developers to support the fishing industry. This funding was used to set up projects (such as research, equipment purchasing, the purchase of a refrigerated van, and harbour improvements) to benefit fishers in the areas the windfarm affected. It was frequently brought up by interviewees in Withouck (2022) as an example of good practice.

There is difficulty in defining who needs to be compensated when sites are developed, as it is often unclear where people fish and the proportion of their catch that will be affected. Often there is little evidence and significant data gaps regarding fishers' activities (Gray *et al.*, 2010). It is therefore difficult for developers to rely on data when deciding on compensation (Gray *et al.*, 2010; Reilly *et al.*, 2016). Gray *et al.*, (2010) reports that one developer believed fishers wanted to make money out of compensation, and therefore the developer preferred paying into long-term community benefit schemes than directly compensating individual fishers. FLOWW (2015) recommend that any disruption settlement should be based on evidence to prove that claims are genuine, and to ascertain the amount of each settlement. Alternative dispute resolution (e.g. mediation) through a neutral third party is recommended by FLOWW (2015) where settlements cannot be agreed.

1.4.3.4. Co-location

Co-location can help to address competition for space enabling multiple industries to be situated within the same area when appropriate. This term is often used when referring to offshore wind and other sectors co-existing in the same space. Static gear fisheries, aquaculture, marine protection, and recreational fisheries have been studied most as potentially being able to share the same space as offshore renewable developments (Haggett *et al.*, 2020). Scotland's National Marine Plan encourages co-location between offshore windfarm projects and fishers, where the industries are compatible, to make good use of space (Schultz-Zehden *et al.*, 2018; Scottish Government, 2015). There has reportedly been little interest by offshore renewable developers in developing co-location projects, due to concern about risks to their work and associated costs (Shelmerdine, 2017; Weir, 2020; Schupp *et al.*, 2021). There are some safety and liability concerns associated with co-location which would need to be addressed to benefit all parties (Haggett *et al.*, 2020; Weir, 2020; Schupp *et al.*, 2021).

Fishers are more likely to push for co-location initiatives, as they may be more negatively impacted without them (Schupp *et al.*, 2021). Vaughan (2017) states that improved technology and liaison with developers is resulting in fishers having increased confidence to fish between wind turbines. Smaller boats may be more suited to working within offshore wind developments than larger vessels (Blyth-Skyrme, 2010). Some forms of fishing (for example, static gear), bivalve aquaculture and seaweed harvesting may be more compatible with co-locating in offshore windfarms; some marine sectors, such as mobile fishing, may be harder to co-locate (Hooper *et al.*, 2018; Schupp *et al.*, 2021). There are a range of successful co-location projects already underway in the UK (Mangi *et al.*, 2011; Rees *et al.*, 2016; Shelmerdine *et al.*, 2017; Ashley *et al.*, 2018; Schéré *et al.*, 2021). The case study below exemplifies how this is working in Lyme Bay. Internationally, co-location practices vary considerably (see [2.4.1.1. Multi-use and co-location](#)).

Lyme Bay Marine Protected Area and Fishing (Rees *et al.*, 2016; Shelmerdine *et al.*, 2017; Schéré *et al.*, 2021)

The Lyme Bay MPA provides a successful co-location example. A 60 square mile area was closed for scallop dredging in order to protect important marine features, but static fishing gear was allowed to continue to be used within it. A working group, consisting of stakeholders of all interests in the area, had a positive effect on ensuring collaboration and an inclusive way towards management. There have been positive outcomes for both the marine ecosystem and static fisher wellbeing due to co-location. This shows the effect that meaningful communication can have on producing successful co-location opportunities. Partnership groups such as these highlight how gaps can be bridged between stakeholders of different levels (such as government, fishers and other interests) thereby benefitting co-management processes.

1.4.4. What should we do to ensure a just transition for coastal communities and marine sectors in Scotland?

The following section of this review will pull out findings from the literature to present potential approaches to facilitate a just transition for coastal communities and marine sectors in Scotland. This will cover topics such as improving engagement and participation; facilitating co-management; encouraging co-location; supporting communities economically; and monitoring and evaluating initiatives. These different approaches could lead to distributional, recognitional and procedural justice for coastal communities and marine sectors. The different pathways forward identified towards a marine just transition, are reflective of the Scottish Government's just transition themes (Scottish Government, 2021a):

- “Planning for a managed transition to Net Zero that maximises the economic and social opportunities, whilst managing the risks;
- Ensuring people have the knowledge and skills to benefit from a just transition, ensuring there are safety nets in place so that nobody is left behind;
- Involving people who have a stake in the transition in the design of how we manage it, whilst building more resilient and healthy communities;
- Spreading benefits of the transition widely, making sure the costs don't burden those least able to pay.”

1.4.4.1. Improve engagement and participation

Trust is reported by some academics such as Alexander *et al.*, (2013) to have historically been lacking in marine management in the UK, between fishers, the government(s) and other stakeholders, and it is said by such academics to be essential that trust is rebuilt to sustainably manage marine resources. Meaningful engagement, and improved communication can help to rebuild trust and lead to better relationships in resource management (Yates, 2014; McKinley, 2023; Dixon *et al.*, 2024). If participation opportunities are to be improved, it is important that opportunities are increased; it is ensured that stakeholders have the capacity to engage in opportunities; and that views of all stakeholders are listened to and acted upon in order for trust to be rebuilt. This could help to improve recognitional and procedural justice.

1.4.4.1.1. Increase and improve opportunities to participate

Famuditi *et al.*, (2018) highlight that conflict regarding decisions surrounding developments and policymaking is more likely to occur if local communities are not given opportunities to participate. Yates (2014) stated that fishers feel that they are not given enough opportunities to participate, especially in discussions surrounding marine protection, which can alienate them and limit their support for policies. A lack of participation was highlighted by Korda *et al.*, (2021) to be the root cause of problems faced by inshore fishers in England. Consultation opportunities that limit options for respondents to provide and expand on views such as surveys or closed consultation questions do not provide meaningful ways for people to participate (Gill *et al.*, 2023).

Providing opportunities for local stakeholders to participate meaningfully in policymaking and development processes can provide many benefits. It can improve understanding of specific local contexts, culture and histories; lead to better knowledge of local impacts; improve marine citizenship; and can lead to more fair and informed policies that may have more buy-in from stakeholders, and therefore increased levels of compliance (Kelly *et al.*, 2014; Yates, 2014; Rudolph, 2017; Haggett *et al.*, 2020; Gill *et al.*, 2023). Participatory approaches can help to support recognition and procedural justice as it can help to address power imbalances and conflicts (Gill *et al.*, 2023).

In order to ensure that participatory processes are meaningful, they should be more equitable to ensure a broad range of values are incorporated into decision-making (Greenhill *et al.*, 2021a). They need to ensure all relevant sectors of the fishing industry are represented, not just those with the loudest voices or the most money, which can be difficult to achieve (Mackinson *et al.*, 2006; Korda *et al.*, 2021; Kelly *et al.*, 2021; Withouck, 2023). It is important that power differentials are considered in the design of participatory approaches so that everyone is able to contribute (Yates, 2018). There also needs to be a genuine belief that participation will make a difference to encourage participation (de Groot *et al.*, 2014; Schéré *et al.*, 2021). When fishers choose to stop attending participatory opportunities, this should prompt discussion of why this is the case, rather than letting attendance stop without understanding why, as it may mean participation no longer feels meaningful or has become challenging for all stakeholders (Korda *et al.*, 2021). It is essential that engagement continues throughout the decision-making process and is not just done at the beginning of a process (Withouck *et al.*, 2023).

Buchan (2024) highlights that any changes encouraging more participation need to come through regulatory requirements. FLOWW's guidance could help to ensure better participatory opportunities between fishers and offshore renewable developments (FLOWW, 2014). The Scottish Government's participatory engagement toolkit could also be used to help design and shape meaningful participatory approaches (Scottish Government, 2023e). Designing meaningful participatory opportunities to suit the required stakeholders is challenging, and considerable time and expertise is needed at an early stage to ensure opportunities are suited to those that need to be engaged.

1.4.4.1.2. Ensure stakeholders are listened to

Korda *et al.*, (2021) suggest that fishers will only participate in engagement processes if they feel that they will actually be heard and have an influence on decisions and outcomes. Frequent face-to-face, one-to-one interactions can help to make it clear to stakeholders that they are heard and can help to build trust (Yates, 2014; Dixon *et al.*, 2024). Feeling disconnected to those responsible for making decisions about managing local environments and feeling that these managers do not have knowledge of what is happening on the ground, can be a barrier towards positive perceptions of policymaking (Korda *et al.*, 2021). Having locally available representatives can increase local stakeholders trust in decision-making processes and help them to feel heard (Anbleyth-Evans, 2018). Providing stakeholders with evidence of how they have shaped decisions is necessary, to show that they are

influencing outcomes. Changing plans after stakeholder consultation, without explaining to stakeholders why, can lead to frustration and a feeling of their voices not being valued, which can result in a lack of future participation (Clarke, 2021). Ensuring that when engagement exercises happen, they do shape decisions, or it is explained why this has not happened and expectations are managed, is necessary.

Fishers, in general, feel that their knowledge should be included more in decision-making (Jones, 2009). In Withouck *et al.*, (2023) a perceived lack of developers' regard for fishers' knowledge was raised as a frustration by fishers. Expectations have to be managed about how much influence fishers will have on developers' decisions. Developers may be cautious about including fishers' opinions when other factors will also influence how developments are sited (Withouck, 2023). Including local knowledge in decisions however can lead to more informed policies and better environmental outcomes. Expert knowledge should not be solely relied upon (Yates, 2014; Gallacher *et al.*, 2016; Anbleyth-Evans, 2018; Evans *et al.*, 2023). Local knowledge and lived experiences can help to fill data gaps which would otherwise be unfilled or would be expensive to fill (Alexander *et al.*, 2013; Yates, 2014; Greenhill *et al.*, 2021b). Local knowledge can therefore help to improve decision-making, can better reflect local contexts and can help to provide a holistic understanding to base decisions on.

1.4.4.1.3. Increase stakeholders' capacity to participate

A lack of capacity (resources, time, or knowledge) to engage in decision-making has been highlighted throughout the literature as a reason that fishers and community members find it difficult to participate in engagement processes run by the government or developers (Evans *et al.*, 2023; McKinley, 2023). Participation can also seem inaccessible to some stakeholders, due for example to unsuitable engagement times and locations or a lack of understanding of engagement processes or needs (Yates, 2014). It is important that participatory opportunities are inclusive and that stakeholders' capacity to participate is improved (Bennett *et al.*, 2021). If the below points are put into place, stakeholders should begin to have increased capacity to engage in decision-making.

Listening to stakeholders to understand what their needs are to participate in decision-making processes is important. Group meetings can be difficult for fishers to attend, as they are often working during the day and attendance could mean missing out on fishing opportunities (Yates, 2014). Ensuring participation opportunities are at suitable times and places that do not negatively impact stakeholders, or if participants are negatively impacted, they are compensated for their attendance, is essential to encourage participation (de Groot *et al.*, 2014; Haggett *et al.*, 2020). Giving fishers the ability to participate in locations (e.g. at harbours) and at times (e.g. when not at sea) suitable to them can help them to feel their views are valued, and can increase their ability to participate (Yates, 2014). Face-to-face in-person meetings and interactions are often seen to be more beneficial, with large public meetings limiting openness of participants (Mackinson *et al.*, 2006; Gray *et al.*, 2010; Yates, 2014; Haggett *et al.*, 2020).

Ensuring stakeholders have the knowledge to participate in engagement processes through increasing their ocean literacy and understanding of decision-making processes, and ensuring accessible language is used, will lead to more informed engagement (Rudolph, 2017; Hagggett *et al.*, 2020; Evans *et al.*, 2023). Information needs to be made available ahead of discussions to ensure stakeholders can make informed opinions and that they understand why it is beneficial for them to engage (Mackinson *et al.*, 2006). Building on and strengthening existing relationships within the fishing sector and within local communities could also help to build community capacity to participate (Ross, 2013). It is essential to ensure communities have resource-rich representatives - including fishing industry representatives and fishing liaison officers - who understand and can communicate the disparate viewpoints of those who are represented by them (FLOWW, 2014; de Groot *et al.*, 2014; Yates, 2014; Clarke and Flannery, 2019).

1.4.4.2. Enable co-management

Evans *et al.*, (2023, page 11) state that “it will be vital to include community representatives in co-developing regional, national and local sustainable blue economy visions and plans”. A step further than ensuring meaningful engagement is to undertake truly inclusive decision-making through enabling co-management of areas between governing bodies and local stakeholders (Mangi *et al.*, 2011; Weir, 2020; Greenhill *et al.*, 2021a; Evans *et al.*, 2023). This involves ensuring communities are involved in decision-making from the beginning of a project, and must ensure meaningful collaboration between all stakeholders, at different scales (from national to local) (Evans *et al.*, 2023; Gill *et al.*, 2023; Buchan, 2024). Co-management is a more inclusive form of management in partnership as it does not involve top-down governance and can help increase buy-in to policies and lead to a greater reflection of local contexts (Schéré *et al.*, 2021; Gill *et al.*, 2023; Thornborrow *et al.*, 2024). It is important to ensure that a definition of co-management is created before such processes begin, so that everyone is working towards the same process and goal (Thornborrow *et al.*, 2024). Co-management can help to enable procedural justice. Examples of enhanced participation and co-management in Sweden are presented in [2.4.3.1. Inclusive decision-making processes](#).

The Benyon Review states that the government should adopt co-management approaches when creating policies surrounding future marine management (Benyon *et al.*, 2022). Benyon *et al.*, (2022) believe that those responsible for managing marine areas should enable partnerships with stakeholders resulting in a sharing of responsibilities between the state and marine users. Schéré *et al.*, (2021) highlight that co-management partnerships should be integrated into MPA management in order to increase their chance of success. Co-management has to involve some transferral of power away from central government to more regional and local management to be successful (Greenhill *et al.*, 2021a). Decision-making should be fully transparent and lead to co-development of pathways forward (Gill *et al.*, 2023; Buchan, 2024). Involving fishers in creating regulations on the ground could be beneficial and help to increase their feeling of agency (Padda, 2019; Hagggett, 2020; Weir, 2020), with Korda *et al.*, (2021) highlighting that there is increasing demand by fishers to be involved in managing fishing. The evidence

suggests that co-management could be used further to help facilitate a just transition for coastal communities and marine sectors.

1.4.4.3. Encourage co-location

Co-location could be beneficial for allowing multiple sectors (such as offshore wind and fisheries/ marine protection/ aquaculture/ tourism) to co-exist within the marine space, helping to reduce the potential for competition for space (Kafas, 2017; Shelmerdine *et al.*, 2017; Ashley *et al.*, 2018; Schultz-Zehden *et al.*, 2018; Thurston *et al.*, 2018; Schupp *et al.*, 2021a). The Scottish Government has recognised that co-existence may present an approach to effectively using Scotland's seas (Scottish Government 2020c; 2022a). According to Schupp *et al.*, (2021), co-location could play an integral role in future offshore renewable development. Co-location could help to support distributive justice.

With industry concerns about safety and liability (see [1.4.3.4. Co-location](#)), to encourage co-location, governmental policy, investment, and research into safety, insurance cover and cost concerns is needed to help support co-location to take place (Kafas, 2017; Greenhill *et al.*, 2021a; Schupp *et al.*, 2021). Government licensing could require co-location to be explored, helping to proactively encourage its use (Kafas, 2017; Schultz-Zehden *et al.*, 2018). Areas for potential mixed-use could also be highlighted in spatial marine planning (Kafas, 2017). Good practice guidance may help to aid co-location, informing developers and other interests of what to expect (North Sea Advisory Council, 2021; Schupp *et al.*, 2021). Innovation funding from large developers (for instance offshore renewables developers) could also help to enable co-location, through facilitating research to improve the knowledge base on the topic (Kafas, 2017). Proposals could be created by developers to explain how they will enable and facilitate fishing within their windfarm (North Sea Advisory Council, 2021). Co-location can only occur if trust is built, and new approaches are needed to collaboratively develop businesses (Yates, 2018; Greenhill *et al.*, 2021b). It does however need to be recognised that co-location may not be universally suitable, and that regulations are needed to enable it (Hooper *et al.*, 2018).

1.4.4.4. Ensure wealth is built in coastal communities

For a just transition to be reached, it is essential that the retention of shared wealth in local coastal communities affected by changes in the marine and coastal area is supported. This support would allow coastal communities to better adapt, reskill and mitigate any potential negative impacts (Evans *et al.*, 2023, Greenhill *et al.*, 2021a, MacNeill *et al.*, 2010). Community Wealth Building (CWB) has been recognised in the Shetland Just Transition Report as essential to minimising negative impacts on lives and livelihoods, enabling local communities to be empowered by opportunities that the (energy) transition creates (Just Transition Commission, 2024; Scottish Government, 2025). A range of wealth building activity needs to occur, whether through supporting skills growth and or diversification, enabling community benefits, providing ownership opportunities or compensating fishers. These approaches can ensure local economies create the shared wealth

and prosperity necessary to support communities to thrive in an economically sustainable and resilient way, helping lead to distributional justice.

1.4.4.4.1. Increase resilience through upskilling and diversification funding

Financial support may be required for industries to adapt and diversify to a changing climate and to meet governmental policies and climate and biodiversity targets (Stead, 2005; MacNeill *et al.*, 2010; Brooker *et al.*, 2018; Greenhill *et al.*, 2021a). Resilience needs to be built in small-scale coastal businesses, including fishers, to enable them to continue to exist (Benyon *et al.*, 2022). According to Korda *et al.*, (2021) small-scale fisheries deserve governmental support as they provide an array of public goods (including monitoring ecosystems; providing knowledge about fish stocks; supporting struggling coastal economies; rescuing sea-goers) which outweigh their negative impacts. Greenhill *et al.*, (2021a) highlight that the fishing industry may need financial support through difficult periods, but this should not be used to enable overexploitation of resources.

The Scottish Government commits to ensuring workers have the skills to access green jobs, including those within the blue economy (Scottish Government, 2022d; 2023a). Skills may not be directly transferrable to new green jobs. It is important to ensure that people can afford to gain the skills they need to participate in new industries, to give them the best chance of being able to fill new roles if old jobs are no longer available (de Groot and Bailey, 2016; Greenhill *et al.*, 2021a).

1.4.4.4.2. Provide community benefits

Community benefits may also support a just transition. They can help to increase acceptance of offshore renewable developments, especially when provided as community, rather than individual, benefits, and can lead to increased resilience of local communities (Walker *et al.*, 2014; Glasson *et al.*, 2022a; Just Transition Commission, 2024). According to Rudolph *et al.*, (2023) defining the community of interest, deciding on types of benefits and considering impacts of developments on communities³ should all be considered when developing community benefit models. Defining the community affected by changes in the marine sphere is difficult but is also essential for determining which communities should receive benefits (Kerr and Weir, 2017; Boomsma *et al.*, 2020). Considering these findings, governmental guidance on defining communities for offshore developments could be improved to aid developers. Rudolph *et al.*, (2023) highlight that community benefit models should be flexible and reflect the needs of local communities. The limitations and meaning of community benefits should be detailed when engaging with local communities, which should occur early on when determining appropriate benefits (Kafas, 2017; Scottish Government, 2018b; Rudolph *et al.*, 2023).

³ Community benefits do not compensate for impacts in Scotland, but this is considered important for community benefits in general.

Walker *et al.*, (2014) argue that greater regulation and governmental institutionalisation of community benefits (e.g. making them a policy requirement) can help to address the social costs of a development and can improve perceptions of community benefit schemes, by increasing their standardisation. Rudolph (2023) recommends that restrictive guidelines for defining community benefits of offshore renewables should be avoided, due to the developing and risky nature of the industry. The Scottish Government is currently reviewing its Good Practice Principles for Community Benefit from Offshore Renewable Energy Developments (Scottish Government 2018a; 2023a; 2024k). For Scotland, the power to mandate community benefits is reserved to the UK government. There are evidence gaps surrounding comparing the mandating and voluntary models of community benefit and their respective connections to more just outcomes for coastal communities and marine businesses. Noting that some of the international literature surveyed and discussed in [2.4.1.1. Community benefits schemes](#) expressed a preference for voluntary models, learning could take place from approaches to community benefits internationally, with examples of mandatory community benefit schemes in Denmark and tax revenue distribution in Germany providing alternative models to be considered.

1.4.4.4.3. Provide fisheries compensation

Although mitigations should ideally be put in place to limit negative impacts, compensation is likely needed for the fishing industry to offset remaining impacts (FLOWW, 2014; Haggett *et al.*, 2020; Greenhill *et al.*, 2021a; North Sea Advisory Council, 2021; Kemp *et al.*, 2023; Withouck, 2023). Fishers feel they need to be compensated when governmental policies or developments are affecting their income, and that it is a social injustice not to do so (Jones, 2009). According to the Just Transition Commission, consistent and equitable compensatory mechanisms for those whose livelihoods are affected by changes towards Net Zero need to be developed (Just Transition Commission, 2024). Knowledge gaps exist surrounding who should be compensated, in which circumstances, and how, and academics argue that these issues are hampering a just future (Owusu Bonsu *et al.*, 2024). Further work is required to help address these knowledge gaps. Currently, there is no governmental obligation on developers to compensate marine users (Withouck, 2022). Fisheries funds, training to diversify or direct compensation are approaches that could be explored, together with options for rules about providing these and deciding who should be in receipt (Reilly *et al.*, 2016). Reilly *et al.*, (2016) highlight that a standardised framework for compensation should be created. Mandatory fishers' compensation schemes do exist internationally in Denmark, Norway, Sweden and The Netherlands (see [2.4.1.3. Fisheries compensation](#)). There are gaps in the evidence surrounding this topic, on whether compensation measures should be mandatory or not, and whether this would lead to increased financial stability of fishers and increased trust in the government.

1.4.4.4.4. Promote community ownership

Community ownership of offshore renewables is one area that has not been particularly explored in the UK marine space but has been explored further in terrestrial spaces in the UK with some exploration of offshore community ownership

present in other countries (see [2.4.1.2. Community ownership](#)) (Akerboom and Van Tulder, 2019; Schultz-Zehden *et al.*, 2018; Scottish Government, 2019b).

Community ownership could help to expand local benefits of energy initiatives, building wealth in often remote and rural locations and allowing communities to use profits to fund local priorities (Greenhill *et al.*, 2021b; Just Transition Commission, 2024). The Scottish Government states that it encourages renewable developers to offer local communities an opportunity to have a stake in renewable developments to deliver economic and social benefits to communities (Scottish Government, 2020c). The Scottish Government has committed to having 2GW of community and locally owned energy by 2030 (total for onshore and offshore, with most progress towards this expected onshore) and encourages new renewable energy projects to offer community benefits and shared ownership opportunities as standard (Scottish Government, 2023b). Joint ownership schemes of offshore renewable developments with communities (or fishers), or shares in a project, could help to provide revenue to local residents or workers (Reilly *et al.*, 2016). Moving community ownership models from terrestrial environments to marine will be challenging, as developments are often more expensive, and there are different land ownership rights and therefore this may not be as accessible for communities (Reilly *et al.*, 2016). However, there are evidence gaps surrounding offshore community ownership.

In 2017, Scottish Ministers committed to distributing 100% of net revenues from marine assets belonging to the Crown Estate which are within 12 nautical miles of the coast to local authorities to benefit coastal communities via the Scottish Consolidated Fund (Scottish Government, 2022e). Moving land ownership of the sea away from The Crown Estate to communities could increase the power of local residents to take part in negotiations about their future (Kerr and Weir, 2017; Weir, 2020).

1.4.4.5. Monitor and evaluate policies

The literature suggests that it is essential that monitoring and evaluation of policies affecting a marine just transition take place to allow an adaptive approach to decision-making, enabling the Government to work responsively to the impacts of policies (Greenhill *et al.*, 2021a). Monitoring and evaluation help to improve planning and future decision-making, allowing policymakers to see what is and is not working (Kelly *et al.*, 2014). Co-management practices, for instance, should be evaluated to see if they are leading to improved governance (Greenhill *et al.*, 2021b). One development that needs to be put in place is an evaluation framework to assess policies and their impacts on coastal populations, with transparent monitoring for those who are impacted (Greenhill *et al.*, 2021a; Padua, 2019). Adaptive management, where adjustments to decisions are made in light of new information, may be an important way forwards, as not everything can be known about policies before they are put into place if we are to meet climate and biodiversity goals (Korda *et al.*, 2021). One area where adaptive management is going to be helpful in enabling a marine just transition is adaptive licenses and quotas to meet needs when fish stocks change location due to climate change, enabling fishers to adapt to changing locations and stocks (MacNeill *et al.*, 2010; Greenhill *et al.*, 2021a). Monitoring and evaluation of policies is necessary to

ensure a just transition, to see what the impacts of decisions are, so that they can be adjusted if they are not achieving their desired aims.

1.4.5. Evidence gaps identified

This literature review has demonstrated that there are gaps in our understanding of various topics related to a marine just transition in Scotland. The below points highlight examples of areas where there are evidence gaps:

- other areas and sectors related to a just transition for marine sectors and coastal communities. These specifically include aquaculture, marine tourism and wave and tidal energy, where impacts on people associated with changes towards biodiversity and climate goals (or climate change) have had limited research in Scotland. Impacts on non-fishers and on island communities have also been under-researched.
- understanding the extent to which competition for marine space within our seas (and on land) is occurring to marine sectors and coastal communities. There is a perception highlighted in this review that less space is/ may be available to fish, but this review did not find any published research that quantifies to what extent this has materialised in UK seas to date as a result of offshore renewable development and increased marine protection. A better understanding of the extent that competition for marine space is occurring could help policymakers to ensure mitigations are in place.
- understanding the unintended impacts and feasibility of fisheries displacement into new areas or moving into alternative forms of fishing, on existing fishers and fish stocks.
- impacts of wave and tidal energy installations on people in the UK (although some information is available internationally – see [2.4.2. Wave and tidal energy](#)), and how a marine just transition could be enabled in relation to these developments. With these novel technologies, these evidence gaps need to be filled to understand their impacts on people.
- understanding how compatible fishing within offshore renewable developments is. Evidence gaps need to be filled to understand barriers to fishing within offshore renewable developments, including safety, liability and insurance concerns, to understand how these can be mitigated.
- understanding how coastal communities are impacted by offshore renewable developments, including on the impacts of local infrastructure and job availability.
- defining communities affected by offshore developments.
- understanding whether community benefits would be better facilitated through policy or as voluntary approaches.
- feasibility of community ownership of offshore renewables.
- ascertaining how fisheries compensation should best be facilitated, how best to include the participation of fishers and the public in marine governance, and how to address barriers to their participation.

1.5. Conclusion

This literature review has focussed on the topic of a marine just transition in the United Kingdom, with a specific focus on the Scottish policy context and how a just transition could be achieved for coastal communities and marine sectors in Scotland. This review has investigated the impact of a move towards climate and biodiversity targets on coastal communities and marine sectors in the UK, outlined what measures have been put in place so far to limit negative impacts, and explored what should be done in the future to enable a marine just transition for coastal communities and marine sectors in Scotland. A combination of factors are likely to lead to compounding impacts on coastal communities and marine sectors over the next few decades in Scotland. For example, through increased offshore renewable development, increased marine protection, or climate change. Although some progress towards limiting impacts on fishers and coastal communities and marine sectors has occurred, the literature suggests that there is more that could be done. A marine just transition is a new and novel topic of interest but is an area which will likely grow in scale and importance in order to ensure that any changes as we move towards biodiversity and climate goals have fair impacts on marine sectors and coastal communities.

The key findings of this review are summarised by research question:

What are the main changes that are likely to occur that affect coastal communities and marine sectors in the UK as we move towards biodiversity and climate change goals?

- The main changes likely to occur that affect coastal communities and marine sectors in the UK as we move towards climate and biodiversity goals, and are increasingly affected by climate changes, are:
 - Changes in fish species availability; sea level rise and increased storm frequency leading to increasingly unpredictable coastal and marine spaces to live and work in;
 - Declining oil and gas production;
 - Increased offshore renewable development;
 - Increased marine protection;
 - Competition for marine space for example between fishers, marine protection and offshore renewable development.

How are coastal communities and marine sectors likely to be impacted by these changes in the UK?

- Offshore renewable development impacts those on and offshore both positively and negatively. The provision of job opportunities, visual impacts, impacts for infrastructure where developments are connected to the land, tourism and recreation could impact local communities. Fishers may also be impacted as developments could affect fish stocks or limit fishing grounds.

There are gaps in the evidence surrounding the ability and willingness of fishers to fish within offshore windfarms, or undertake work for offshore developments.

- Increased marine protection to help meet biodiversity goals could have positive or negative impacts on marine tourism and recreation. It could also lead to spatial restrictions for fishers – although impacts will depend on marine protection measures and may affect different fishers differently.
- A changing climate and biodiversity crises may require the adaptation of fishers to changing fish stocks, with quotas and licenses potentially impacting on the ability of fishers to respond, and successfully adapt, to these changes, if they are not updated at pace. This may be compounded by wider economic and geographical impacts which may make fishers more susceptible to any further impacts associated with marine development or protection. Displacement and diversification of fishing effort could occur as a result of spatial restrictions on fishers' actions. Fishers may move to fish in new areas, although this may be easier and safer for larger vessels than those small-scale. Fishers may choose to diversify into using different fishing gear, although this could especially be costly and more difficult for smaller-scale fishers, and could cause conflict with existing fishers. Fishers may also choose to diversify into other sectors, such as tourism or working in renewables, or may leave fishing entirely. Leaving fishing may not be wanted or possible for some fishers.
- Changes to the use of the sea may impact cultural, historical and social connections to the sea. A loss of fishing could result in considerable changes to coastal communities, impacting generations of workers, the physical character of areas and the economic viability of some coastal communities. Jobs in new industries could present opportunities to some coastal communities, although may not appear or be suitable or accepted.
- There is a perception that there has been low coastal community and fisher participation in marine governance in the UK, which may be undermining trust in decision-making.

What has already been done to reduce negative impacts and increase positive impacts on coastal communities and marine sectors in the UK?

- A variety of work has already been undertaken to try and make changes in the marine sphere more just for coastal communities and marine sectors. Four areas of effort are recognised within this report, with case studies of examples provided:
 - The importance of engagement, participation and co-management opportunities has been recognised. Some engagement practices in the past have been perceived to be poor. Engagement in marine spatial planning has provided some opportunity for communities to participate, however some of the literature reviewed has suggested that historically this has not always been successful. The Scottish Government plan to

improve engagement opportunities within the creation of NMP2. Work has been done to improve engagement of fishers in offshore renewable developments. The Scottish Government strives for co-management of inshore fisheries, and this could be further developed in the future.

- Community benefit schemes can help to provide benefits of offshore renewable developments to local communities. These schemes are voluntary within Scotland. The Scottish Government's Good Practice Principles for Community Benefits for Offshore Renewable Energy Developments provides some guidance for developers. Examples are provided of community benefit fund policies and schemes within the UK.
- Fisheries compensation could help to mitigate impacts of offshore renewable developments on fishers. Scottish legislation does not oblige developers to compensate for their impacts. Some examples of successful fisheries compensation schemes are detailed.
- Co-location could provide a way of addressing competition for marine space, allowing multiple industries to occur in one space. Some successful examples of co-location schemes are provided.

What should we do to ensure a just transition for coastal communities and marine sectors in Scotland?

- There are a variety of avenues for exploration which could further enhance a just transition for coastal communities and marine sectors. The approaches identified towards a marine just transition as highlighted reflect well on the Scottish Government's just transition themes, and provide ways of improving distributional, recognitional and procedural justice.
- Improving engagement and participation is essential to build trust in marine decision-making and to ensure stakeholders views are considered. Increasing and improving engagement opportunities, making them suited to those who need to be engaged and be listened to can benefit marine decision-making by increasing local understandings in decisions. Improving stakeholders' capacity (time, knowledge, resources) to participate is important, and may enable better participation. Ensuring participants are listened to, and that engagement is not tokenistic, is important to ensure further participation.
- Co-management opportunities should be improved to enable real partnership in marine decision-making, enabling greater buy-in to governance decisions and processes.
- Co-location should be encouraged to enable mixed-use of the sea. Concerns surrounding liability, safety and trust need to be understood and addressed to enable co-location to occur.
- Wealth building of coastal communities and marine sectors needs to occur in order for these stakeholders to be able to adapt, reskill or mitigate negative impacts of the changes expected as we move towards biodiversity and

climate goals. Providing funding to support upskilling and diversification, improving guidance and regulation (where issues are devolved) of community benefits, promoting community ownership opportunities and improving fisheries compensation could help to enable a just transition.

- Policies affecting marine and coastal communities should be monitored and evaluated, to ensure they are having the desired outcomes and enabling a just transition.
- A variety of evidence gaps are detailed and filling them could help address the considerable knowledge gaps evident on the topic of a marine just transition.

2. A literature review on international marine just transition oriented policies

2.1. Executive Summary

This literature review investigates the existing policy practices on marine just transition in an international context, specifically focusing on marine renewables and fisheries. This literature review seeks to enhance understanding and consider learning opportunities from international marine just transition oriented practices.

The literature review seeks to answer the following questions:

1. What just transition oriented policies on marine renewables and fisheries have been implemented internationally in countries similar to Scotland?
2. What were the strengths and weaknesses of these policies from the perspective of the Scottish Government's just transition strategy?
3. How can the learnings from these policies be applied in Scotland?

2.1.1. Key findings

- Scotland is considered by some academics as one of the leading countries in offshore renewables development which limits the learning opportunities from other countries with similar marine spaces.
- The most common just transition oriented policies identified in the international literature include community benefits, community ownership and compensation measures from offshore renewables; local action groups for fisheries; and multi-use and co-location in marine spatial planning.
- In the context of offshore renewables, a just transition is conceptualised around the distribution of benefits from renewable energy developments and the mitigation of negative impacts on other marine users, especially fishers.
- Just transition for fisheries includes better recognition of small-scale fisheries and improved access to decision-making processes.
- The policies identified from the international literature with the greatest learning potential for Scotland is community ownership of offshore wind with strong potential to learn from domestic onshore and international offshore practices.
- All marine sectors are deeply intertwined as a result of sharing the same marine space and one sector cannot be considered in separation from the others.
- There are lots of evidence gaps as a result of the nascent nature of the marine renewables sector; a general lack of research into co-location, wave energy and tidal energy; and a lack of literature evaluating current policy practices.

2.2. Introduction

This literature review investigates the existing policy practices on the topic of a marine just transition in an international context, specifically focusing on marine renewables and fisheries. This literature review seeks to enhance understanding and consider learning opportunities from international marine just transition oriented practices. This literature review builds on the definitions outlined in the domestic literature review (see [1.2. Introduction](#)).

2.2.1. Report structure

This report, the second of the two literature reviews presented here, consists of two sections. The first section sets out the methodology of the literature review, including research questions and aims, and the search parameters. The second section is divided into marine sectors with sub-sections on each just transition oriented policy identified in the context of each respective sector. These include offshore wind, tidal and wave energy, fisheries and marine spatial planning. The sub-sections will discuss how the policy practices relate to a just transition, highlight good practices, and, when relevant, discuss what Scotland could learn from international practices.

2.3. Methodology

This section of the report addresses the methodological approach applied in conducting this literature review.

2.3.1. Literature review aim and research questions

The aim of the international literature review was to identify and evaluate marine just transition policies on marine renewables and fisheries that have been implemented internationally in countries similar to Scotland, to see what Scotland could learn from them.

The literature review research questions included:

1. What just transition oriented policies on marine renewables and fisheries have been implemented internationally in countries similar to Scotland?
2. What were the strengths and weaknesses of these policies from the perspective of the Scottish Government's just transition strategy?
3. How can the learnings from these policies be applied in Scotland?

2.3.2. Literature review parameters

The initial parameters were refined after initial literature searches had been conducted. This was due to the area of marine just transition being a new concept and the initial searches being highly exploratory to understand the scope of the literature. Due to the large scope of international literature on marine just transition (see [2.3.5. Literature search](#) for details), the parameters were narrowed down to the following:

- Academic literature
- Grey literature including reports and publications by international agencies, national and regional government agencies, and NGOs
- Literature focused on marine renewables (offshore wind, wave and tidal energy) and fisheries
- Countries with a comparable international context (see [2.3.3. Choice of international comparators](#))
- Literature published in English

The review excluded:

- Academic literature with limited analysis of marine policies (e.g. theory and methodology driven papers, papers focused on public perceptions, and publications with a normative focus)
- Academic publications with limited peer-review processes (e.g. theses below PhD level)
- Unpublished governmental policy documents

The publication dates were not limited, but they were taken into consideration when evaluating policies.

2.3.3. Choice of international comparators

The selection of international comparators was based on several factors. First, due to the strong interlinks between marine renewables and the fishing industry, the selection of comparison countries was led by the development stage of the marine renewables industry to enable a comparison between countries with similar marine spaces. Secondly, factors including economy size, and language were considered.

- The North Sea countries with well-established offshore renewable industries (Denmark, Germany, The Netherlands and Belgium) were chosen as initial points of comparison.
- Norway and Sweden were added to the comparison - despite the nascent nature of their offshore renewables industries - on the basis of the size of their economies.
- Canada has been used as a comparator country in the context of wave and tidal energy due to the stage of the development of the industry and literature available in English.

2.3.4. Limitations

A variety of limitations to this research are apparent:

- While generic search terms (see [Appendix 1](#)) were used to identify initial literature, the literature searches were also shaped by the pre-existing assumptions of areas of interest that may be linked with a marine just transition. As such, there was some bias in identifying literature and topics – some relevant topics may have had little mention within the literature found because of the search terms used. For example, marine protected areas were not included in the search terms.
- As the initial literature searches led to a high volume of relevant literature, the scope of the international literature review had to be narrowed down to specific topics. Offshore renewables and fisheries were identified as the most popular topics in initial literature searches and were therefore the primary focus. As such, this review was not able to cover other areas of the international marine just transition literature, such as coastal management and coastal communities.
- The ability of the literature review to effectively address research questions on strengths and weaknesses of international policies and their applicability to Scotland was heavily limited by linguistic barriers. Most of the comparator countries were not English-speaking which led to a limited number of publications, both academic and grey, being available in English. As a result, the literature review has various gaps in coverage. It is also recognised that some of the international policies may be outdated due to lack of up-to-date literature available in English.

- While the comparator countries were selected using the method outlined in the section above, the wider context of Scotland’s devolution settlement with the UK should be considered in any comparisons drawn, as in some instances the Scottish Government does not have the power to change policies.
- This literature review covers a wide range of literature including published reports or policy documents (academic, government and NGO), as outlined earlier in this methodology chapter. There may be more up-to-date information than is available in the literature which is yet to have been published or made publicly available, and so this information is not included here. This should be taken into consideration when reading the findings of this report.
- Finally, the nascent nature of some of the marine sectors and policy practices set limitations for the review. Due to the recent implementation of many of the marine policies, there was often little to no literature identified that evaluates the effectiveness of and learning from these policy practices. Consultation with experts on comparator countries would have been required to fully understand the impacts and nuances of most presented policies but there was not scope to do this in this exercise.

2.3.5. Literature search

Initial literature searches were conducted by Scottish Government researchers and a Scottish Government librarian. Literature searches were conducted in four different databases using the same search terms (see [Appendix 1](#)). The databases included The Knowledge Network, The Scottish Government Library resources (Knowledge and Exchange), Google Scholar and Google. The searches in databases were continued until two pages of irrelevant results was exceeded.

The term “just transition” is not widely used in marine sectors nor the literature. However, there are no known alternative terms in place. Due to this, a wide range of search terms were used to capture relevant literature. The initial searches were highly exploratory in order to gain a better understanding of the scope of literature in the field. As a result of a high volume of relevant literature identified through initial searches, the scope of searches was narrowed down to focus on marine renewables and fisheries to enable the review to be completed in the time available. This decision was made because the bulk of literature that emerged in the initial searches covered these topics. This decision also reflected Scottish Government policy priorities. The focus of the literature was further narrowed down to countries with comparable international contexts to Scotland (see [2.3.3. Choice of international comparators](#)). Additional literature was added to the analysis through snowballing, where additional sources are selected from the reference lists of those found in initial searches.

2.4. Findings

The findings presented below have been divided into sectors, with each sub-section consisting of a marine just transition oriented policy (e.g. a policy that helps to ensure more just impacts on marine sectors and coastal communities), and learnings from these where relevant and available. Examples of good practice and innovative policies have been highlighted as case studies where appropriate. While the following findings have been divided into sectors, this division is made for practical purposes and it is highly artificial. In reality, all of these sectors are deeply intertwined as a result of sharing the same marine space and one sector cannot be considered in separation from the others.

2.4.1. Offshore wind

Offshore wind leads to a range of positive and negative impacts on coastal communities and marine sectors, which have been discussed already in the domestic review (see [1.4.2.1 Impacts of offshore renewable development on coastal communities and marine sectors](#)).

The policies most commonly discussed in the international literature that aim to address negative impacts and support benefits of offshore wind developments on marine sectors and coastal communities include community benefits, community ownership and fisheries compensation. As stated by Herrera Anchustegui (2021), these practices can help to bring a sense of justice to communities that are impacted by energy developments through the distribution of benefits from offshore wind and citizen participation in energy development. In addition to benefitting local communities, some sources highlight that these measures can also increase local support for offshore renewables (Kerres *et al.*, 2020; Lange *et al.*, 2018).

Some of the sources consulted in the international literature on offshore wind have identified the UK as one of the leaders in the offshore renewables industry (Ramos *et al.*, 2021) and both the UK and Scotland are commonly used as a reference point for other countries in the literature particularly in areas such as community benefits schemes and progressive just transition policies (eg. Gallaher *et al.*, 2023; O'Hanlon and Cummins, 2020; Proimakis *et al.*, 2021; Sangiuliano and Mastrantonis, 2017). Because of this, the learning opportunities from other countries who may be perceived to be further behind in the development of offshore renewables than Scotland and the UK, are limited.

2.4.1.1. Community benefits schemes

General information about community benefit schemes are outlined in the domestic review above (see [1.4.3.2. Community benefits](#)). Scotland follows a similar community benefit model to the comparison countries (see box below) with voluntary community benefit schemes delivered by the project developer (see Scottish Government, 2018b). Further details of the UK's experience of community benefits can be found in [1.4.3.2. Community benefits](#). The main exceptions to this model are Germany, where community benefits are distributed by federal states through tax revenue (Rudolph *et al.*, 2015), and Denmark that has two mandatory offshore community benefit schemes that include payments for municipalities and

neighbouring communities (Herrera Anchustegui, 2021; Regen, 2022). In Denmark, the “Green pool scheme” consists of a singular payment to hosting municipalities by the project developer, while the “VE-Bonus scheme” includes yearly payments to neighbouring communities of the development (Herrera Anchustegui, 2021; Regen, 2022).

Community benefit policies in international comparator countries

Scotland

Voluntary offshore community benefit schemes (Scottish Government, 2018b; Herrera Anchustegui, 2021).

The Highland Council has specific community benefit policies that guide the benefits from developers and regulate how the benefit payments from offshore wind are distributed (Rudolph *et al.*, 2015; The Highland Council, 2013).

Denmark

Mandatory offshore community benefit schemes:

2008 - 2018: Community fund set up by the state for beneficiary communities defined by distance (DKK 0.004 per KWh for 22,000 hours at peak load);

2020 onwards: 1) VE Bonus scheme: Yearly payments to neighbours by the project developers – eligibility and amount determined by the Danish Energy Agency; 2) Green pool scheme: One-time payment to hosting municipalities by project developer (DKK 115,000 per MW) (Herrera Anchustegui, 2021; Regen, 2022).

The Netherlands

Voluntary offshore community benefit scheme commonly defined by distance.

Project developer sets up the community fund (Herrera Anchustegui, 2021).

Germany

Community benefits through tax revenue distribution (Rudolph *et al.*, 2015).

In theory, 70% of the tax income is distributed to the community where the windfarm is located and 30% to the community where the headquarters of the developer is situated (Rudolph *et al.*, 2015). However, due to offshore wind developments being located outside municipalities, the beneficiary communities are defined by coastal federal states (Rudolph *et al.*, 2015).

Belgium

No information available

Norway

Voluntary offshore community benefits scheme (Herrera Anchustegui, 2021).

Sweden

No information available

While a mandatory model can guarantee benefits to impacted communities, some of the evidence consulted in the international review suggests that the voluntary model provides flexibility and the option to tailor community benefits around community needs (Rudolph *et al.*, 2015). The voluntary model has been suggested by one source to have a broader scope both geographically and through a greater variety of benefits (Herrera Anchustegui, 2021). However, as voluntary community benefits are project specific and there is a lack of literature evaluating different voluntary benefit schemes, it is difficult to draw conclusions on the success of the schemes. Scotland is regarded by some academics as one of the leading countries in community benefits from offshore renewable developments. Previous analytical work to compare the Scottish model to other offshore wind countries recommended maintaining the Scottish model of voluntary benefits due to its flexibility (Rudolph *et al.*, 2015).

2.4.1.2. Community ownership

Community ownership of renewable energy generally refers to full or partial community ownership of an energy project. Community ownership can decentralise decision-making over processes surrounding energy production to local communities and increase citizen participation in the energy sector (Herrera Anchustegui, 2021; Hoicka *et al.*, 2021; Standal *et al.*, 2023). Community energy in the context of offshore wind refers specifically to energy projects where communities have partial ownership of offshore energy developments, due to the high financial risks and costs of offshore wind making full ownership difficult for communities.

Community ownership of offshore wind remains uncommon internationally, but there are some examples of voluntary shared ownership in the North Sea context (see box below). These include shareholding opportunities through cooperatives in The Netherlands, Denmark (see Middelgrunden case study below) and Belgium (Akerboom and van Tulder, 2019; Herrera Anchustegui, 2021; Schultz-Zehden *et al.*, 2018; Wyns, 2023). In Germany, municipal utilities have traditionally had strong ties to the community and have become shareholders in offshore wind (Herrera Anchustegui, 2021; Richter, 2013). A mandatory community ownership scheme has been trialled in Denmark (see mandatory ownership case study below). However, no academic or grey literature was identified in the review that could provide an in-depth description of these cooperative models or evaluation of them.

Community ownership policies in international comparator countries

Scotland

No community ownership schemes. The potential for shared ownership of offshore wind is explored (Scottish Government, 2023b).

Denmark

Unsuccessful trial for mandatory community ownership scheme was conducted 2008 - 2020 (see case study below).

Currently have voluntary shareholding opportunities for offshore wind through cooperatives (Schultz-Zehden *et al.*, 2018).

The Netherlands

Voluntary shareholding opportunities for offshore wind (Rudolph *et al.*, 2015).

Germany

Voluntary joint community ownership for offshore wind through municipal utilities ownership and citizen participation (community buy-in) (Rudolph *et al.*, 2015).

Belgium

Co-operatives that allow citizens to purchase shares of offshore wind developments (Wyns, 2023).

Norway

No information available

Sweden

No information available

The Middelgrunden windfarm

The Middelgrunden windfarm in Copenhagen, Denmark was developed in cooperation between the Middelgrunden Wind Turbine Cooperative and the local utility called Copenhagen Energy (Schultz-Zehden *et al.*, 2018). All the investment costs were shared between the two parties and the parties own ten wind turbines each (Schultz-Zehden *et al.*, 2018; Vikkelsø *et al.*, 2003). The two owners collaborate, but the businesses are run separately (Vikkelsø *et al.*, 2003).

The Middelgrunden Wind Turbine Cooperative has 40,500 shares and over 8000 co-owners (Vikkelsø *et al.*, 2003). The co-owners primarily consist of individuals, but they also include unions, organisations, foundations and companies (Vikkelsø *et al.*, 2003). The majority of the shares are owned by people living in Copenhagen or the surrounding municipalities as the initial sale of shares was limited to these groups (Vikkelsø *et al.*, 2003). The cooperative was established as a partnership with joint and several liability (Vikkelsø *et al.*, 2003). There are bylaws in place to prevent the partnership from contracting debt (Vikkelsø *et al.*, 2003), therefore reducing risks for shareholders.

In the Danish model, votes in offshore cooperatives are limited to one per person, therefore being independent of the number of shares (Schultz-Zehden *et al.*, 2018). Households commonly own 3 - 5 shares which is enough to cover electricity consumption for standard households (Schultz-Zehden *et al.*, 2018).

Some sources consider Scotland to be one of the global leaders in onshore community energy (Fuentes González *et al.*, 2019) and Scotland has existing policies for shared ownership in the context of onshore wind (eg. Scottish Government, 2019b). However, Scotland does not offer or require shared ownership opportunities for offshore wind developments (see [1.4.4.4.4. Promote community ownership](#)). Community ownership is a mechanism to increase the acceptance of energy projects for hosting communities and increase the participation of local citizens in the energy transition (Herrera Anchustegui, 2021). Community ownership can also enable communities themselves to define who the beneficiaries of offshore wind are, which is not the case for community benefit schemes run by developers, where the developers decide beneficiaries (Rudolph *et al.*, 2015). As such, the evidence considered in the international literature review suggests that community ownership of offshore wind developments can enable both local benefits and growth of the offshore wind industry.

Mandatory community ownership of offshore wind in Denmark

Denmark has a history of community ownership of offshore wind through cooperatives, which has enabled individuals and trade unions to purchase shares of offshore wind projects (Schultz-Zehden *et al.*, 2018). Between 2008 and 2020, Denmark trialled a mandatory community ownership scheme for offshore wind (Herrera Anchustegui, 2021). Under this scheme, offshore wind developers were required to offer a minimum of 20% of the offshore windfarm for local communities and municipalities, giving priority to people in close proximity to the developments (Mendonça *et al.*, 2009). It was only mandatory to offer this share to communities, not for communities to accept it (Danish Energy Agency, 2017).

The trial led to the establishment of offshore wind developments with shared ownership with communities. However, the trial was deemed unsuccessful on the basis that community ownership did not increase local support for offshore renewables (Herrera Anchustegui, 2021). With a limited amount of information being available in English, it is unclear whether other factors were taken into consideration in the cancellation of the scheme. Defining success solely on the basis of community acceptance ignores other benefits such as the justice implications that community ownership can enable for impacted communities.

Further investigation into the impacts of this trial in Danish communities would be beneficial to understand whether Scotland could benefit from a mandatory shared ownership model for offshore wind.

It is possible that the lack of offshore wind community energy development is linked with the historical development of community ownership in Scotland. Scotland's community energy landscape has historically focused on community development trusts (Harnmeijer *et al.*, 2018) that present an ownership model where community energy projects are fully owned by community bodies (van Veelen, 2017). This is in contrast to countries such as Denmark and Germany that have a strong culture of co-operatives pre-dating offshore wind development (Mendonça *et al.*, 2009; Nordic Energy Research, 2023). As shared equity is the dominant community energy model for offshore wind, countries with more extensive experience on co-operatives and shared ownership might have an advantage in applying their knowledge to offshore wind. However, the Scottish onshore community energy sector has seen a clear shift towards shared equity models (see Community Energy England, 2022) which gives potential to apply the sectoral knowledge to offshore wind.

2.4.1.3. Fisheries compensation

Compensation mechanisms exist as a way to mitigate harm that is caused by offshore wind development. There are a number of mandatory compensation schemes for different interest groups across the comparator countries (see box below), including fisheries and in some cases coastal communities. While compensation mechanisms have strong synergies with equal access to benefits from the marine environment, this differs to policies such as community benefits, in that compensation is a restorative practice, not proactive.

Fisheries compensation policies in international comparator countries

Scotland

Voluntary compensation for impacted fisheries (Withouck *et al.*, 2023). The compensation is a last resort measure and the financial compensation may involve monetary payment to specific vessels or to a fisheries community fund (Withouck *et al.*, 2023).

Denmark

Monetary and non-monetary compensations for fishers (Owusu Bonsu *et al.*, 2024).

Negotiated compensations for fishers for documented permanent or temporal losses across offshore wind development life-cycle (based on logbook evidence from 2 - 10 years) (Owusu Bonsu *et al.*, 2024). Includes compensation for lost time and cost of longer travel distances. Non-monetary compensation may include, for example, access to bottom trawling (Owusu Bonsu *et al.*, 2024).

The Netherlands

Conditional compensation for fishers based on appeal on adverse effects from offshore if losses are beyond normal risk (Owusu Bonsu *et al.*, 2024). Negotiated with the government (Owusu Bonsu *et al.*, 2024).

Germany

No direct compensation for fishers (Owusu Bonsu *et al.*, 2024).

5% of offshore licensing fees are directed to support fisheries (Owusu Bonsu *et al.*, 2024).

Belgium

No compensation for fishers (Owusu Bonsu *et al.*, 2024).

Norway

Mandatory compensation mechanism for impacted fishers (sole payment or annual payments) on the basis of economic losses due to seizure of grounds, lost fishing time due to travel distances, or damage to objects (Owusu Bonsu *et al.*, 2024).

Adopted from a compensation mechanism from oil and gas exploitation (Owusu Bonsu *et al.*, 2024).

Sweden

Compensation for fisheries in areas of assumed loss of income. Negotiated between the developer and fishers (Owusu Bonsu *et al.*, 2024).

The evidence from this literature review suggests that the most common recipient of compensation schemes regarding offshore wind are fisheries. The compensation schemes vary widely from monetary to non-monetary compensation, the evidence required for compensation, and whether the compensation is negotiated with the developer or the government. Monetary compensation measures for fishers are in place in Denmark, The Netherlands, Norway and Sweden (Owusu Bonsu *et al.*, 2024). In Denmark and Norway, compensation is commonly based on adverse effects of offshore wind development leading to either temporary or permanent losses for fishers and it may also include compensation for lost fishing time or increased cost due to longer distances that fishers have to travel to access fishing grounds as a consequence of windfarms (Owusu Bonsu *et al.*, 2024). In addition to monetary compensation, Denmark provides non-monetary measures that may include, for example, giving fishers exemptions to access bottom trawling along cable lines (Owusu Bonsu *et al.*, 2024). Bottom trawling can cause damage to undersea cables (European MSP Platform, 2015) and is normally not allowed within 200 metres of cables in Denmark (Owusu Bonsu *et al.*, 2024).

Due to the limited English language literature available on the topic, it is unclear what evidence is required for compensation in most countries. However, in Denmark logbook evidence from the last 2 -10 years is required for compensation, although this can create disadvantages for fishers with improper records (Owusu Bonsu *et al.*, 2024). The requirement of logbook evidence is likely to lead to inequalities in the UK, where evidence of catches from the previous three years is required for compensation (Owusu Bonsu *et al.*, 2024). Fisheries compensation in the context of the UK is discussed in [1.4.3.3. Fisheries Compensation](#). However, it must also be noted that in most of the comparator countries, safety zones around windfarms extend up to 500 metres, more considerably reducing areas available for fishing compared with the UK where these safety zones do not exist (see [2.4.4. Marine spatial planning](#)). In comparison, the UK has not implemented mandatory safety zones around offshore windfarms and the developer posed safety zones are only 50 metres (Owusu Bonsu *et al.*, 2024). More evidence of the international compensation schemes is required to effectively evaluate them. In terms of coastal communities, the only comparator country offering compensation is Denmark that has a mandatory compensation scheme for losses on residential property value as a result of offshore wind development (Herrera Anchustegui, 2021).

2.4.2. Wave and tidal energy

Offshore wind dominates marine renewable development, but there are other emerging marine technologies. While wave and tidal energy are still nascent

industries (Proimakis *et al.*, 2021, Ramos *et al.*, 2021), their future development and expansion will need to consider similar social dimensions as offshore wind. These include inclusive stakeholder and community participation, community benefits and community ownership. Many academics highlight that Scotland is considered as one of the leading countries in tidal energy development (Carlson and Adams, 2020, Sangiuliano and Mastrantonis, 2017) which provides particularly good opportunities for the development of an innovative and internationally competitive sector.

The international literature on wave and tidal energy is more limited in comparison to offshore wind due to the nascent stage of the industry. It is therefore important to learn from the successes of offshore wind in delivering positive impacts for stakeholders and impacted communities (Howell and Drake, 2012). Canada is used as a primary comparison point in this section due to the stage of the development of their marine renewables industry, and because they have a marine renewables policy landscape with strong just transition orientation.

2.4.2.1. Community benefits and ownership

Community benefits discussion in the context of wave and tidal energy has primarily focused on direct benefits such as skills development, employment, and financial benefits (Howell and Drake, 2012, Nova Scotia, 2014), rather than mechanisms such as community benefit funds. For example, in regional Canadian marine renewables policies, these benefits are not mandatory but a possible result of engagement processes, and they are discussed in relation to indigenous communities, rather than stakeholders in general (Nova Scotia, 2014). As such, the learning opportunities for community benefits for wave and tidal energy are more likely to come from existing community benefit practices, either from international offshore wind policies (see [2.4.1.1. Community benefits](#)) or existing community benefit practices in Scotland (see Scottish Government, 2019b).

Community ownership of wave and tidal energy has remained limited. The relatively high cost of wave and tidal energy in comparison to more established forms of renewable energy is a major barrier for community ownership (Proimakis *et al.*, 2021). Limited financing mechanisms for community-owned small-scale wave and tidal energy contribute to the lack of community ownership (Proimakis *et al.*, 2021). While some support mechanisms for small-scale community tidal projects exist in Canada, the lack of consistency in the regulatory environment has compromised the growth of small-scale tidal energy (Carlson and Adams, 2020). Similar to community benefits, the learning opportunities for community ownership of marine renewables in Scotland are therefore more likely to come from existing community energy practices in Scotland (see Scottish Government, 2021b) or international examples of offshore wind (see [2.4.1. Offshore wind](#)).

Practices of community participation vary both between countries and regionally. Progressive policies of community participation have been highlighted in the case study below on community engagement in tidal energy development in Nova Scotia, Canada.

Community engagement in tidal energy development in Nova Scotia, Canada

Canada is recognised as one of the leading countries in tidal energy (Marine Renewables Canada, 2018). Besides policy and support mechanisms at federal level, policy measures at provincial level play an important role in the development of marine renewables, including tidal energy (Marine Renewables Canada, 2018). Nova Scotia, in particular, has developed a number of just transition oriented policies and legislations related to both tidal energy and marine renewables in general. These include Nova Scotia Marine Renewable Energy Strategy (Nova Scotia, 2012a), Statement of Best Practices for In-Stream Tidal Energy Development & Operation (Nova Scotia, 2014) and Marine Renewable Energy Act 2015 (Nova Scotia, 2015a). In addition, the tidal energy engagement processes draw from existing policies and practices that incorporate ideas of a just transition (see Nova Scotia, 2015b; Nova Scotia, 2012b; Nova Scotia, 2010).

One of the key objectives of tidal development in Nova Scotia has been the inclusion of Indigenous people in marine renewables development (Nova Scotia, 2012a). Following the interest of Mi'kmaq (an indigenous community) to collaborate in the development of marine renewables, Nova Scotia has been seeking input from this community on marine renewables since 2006 (Nova Scotia, 2012a). This has involved inclusion of traditional ecological knowledge (TEK) in strategic environmental assessments; participation of community representatives in project liaison committees; funding for a Mi'kmaq specific renewable energy strategy; and developing plans for education and training opportunities for community members for the marine renewables sector (Marine Renewables Canada, 2018; Nova Scotia, 2012a). Furthermore, Nova Scotia has made a commitment to work with communities to develop opportunities to participate in energy development; build links between Mi'kmaqs' renewable energy strategy and their participation in the industry; encourage industry engagement with the communities; and emphasise the role of TEK in all marine renewables development (Nova Scotia, 2012a). There are also requirements for utilising the local supply chain in marine renewables development (Proimakis *et al.*, 2021). In general, public consultations on tidal and other marine renewables development are legally obligated in Nova Scotia (Nova Scotia, 2015a).

While no literature that addressed the implementation and effectiveness of these policies in Nova Scotia were identified, the community and stakeholder oriented marine policy landscape in Nova Scotia presents a good example of practice that could provide a more just marine energy transition in Scotland. The elements of engagement and collaboration strategies with Mi'kmaq in Nova Scotia could be applied to the context of communities impacted by tidal (and other) energy developments, especially rural and remote communities. Furthermore, when tidal energy progresses to commercial stage, Scotland could benefit from best practice guidance for delivering socio-economic benefits from the industry. This would be a natural follow-up of the existing practices in the Scottish renewable energy sector (see Scottish Government, 2019b).

2.4.3. Fisheries

Fisheries management is an important part of a marine just transition. However, globally fisheries face various challenges including competition for reduced marine space, controls on catch, a changing climate, and a lack of access to decision-making processes (see Carpenter and Kleinjans, 2017). While these issues are likely to affect a range of fisheries, the literature identifies small-scale fisheries as a particularly vulnerable group with less power and political recognition than large-scale fisheries (e.g. Bugeja-Said *et al.*, 2022; Jentoft and Chuenpagdee, 2022; Linke *et al.*, 2022). The injustices faced by small-scale fisheries are commonly discussed in relation to ‘blue justice’ internationally, a field of research that examines the impacts of the blue economy and blue growth in small-scale fisheries (Jentoft, 2022). According to Jentoft and Cheunpagdee (2022) blue growth, referring to sustainable economic growth in marine sectors, is increasing competition for marine space and resources and it is expected to have negative impacts on small-scale fisheries due to their vulnerability and lack of political recognition. Questions about how blue growth benefits small-scale fisheries, whose voices are heard and who gets to participate in processes are central to blue justice (Jentoft and Chuenpagdee, 2022).

This section discusses approaches which could aid a marine just transition for fisheries as identified in the literature, specifically focussing on the role of inclusive decision-making processes and fisheries local action groups (FLAGs). Fisheries policies that intersect with offshore wind are covered under offshore wind (see [2.4.1.3. Fisheries compensation](#)) and marine spatial planning (see [2.4.4.1. Multi-use and co-location](#)).

2.4.3.1. Inclusive decision-making processes

Sweden’s stakeholder inclusion practices in fisheries decision-making are extensive. These include active co-management practices with widespread use of consultations, and interactive stakeholder participation (Carpenter and Kleinjans, 2017). For example, the reform of the demersal quota system in response to changing European Union (EU) regulations was facilitated by fishers and NGOs (Carpenter and Kleinjans, 2017). This included extensive consultation with local fishers and collective deliberation on issues to legitimise new demersal quota management among fishers (Carpenter and Kleinjans, 2017). In the UK, numerous consultation practices are in place, but they are often undertaken through written consultation, which lack interaction and engagement with participants (Carpenter and Kleinjans, 2017). Discussions around engagement and participation in the UK are presented in [1.4.3.1. Engagement, participation and co-management](#) and [1.4.4.1. Improve engagement and participation](#). Opportunities for participation in the UK exist through government driven partnerships, but the participation has been classed as functional rather than fully interactive (Leite and Pita, 2016). As such, Sweden provides an example of a more bottom-up approach to stakeholder participation.

2.4.3.2. Fisheries local action groups (FLAGs)

FLAGs are an area-based EU initiative seeking to increase employment and territorial cohesion in communities dependent on fishing and aquaculture through local initiatives (Bugeja-Said *et al.*, 2022). FLAGs seek to ensure community involvement in local strategy development and they provide skills and advice for local actors (Budzych-Tabor, 2014). Some of their key activities include helping develop the local fishing sector, diversifying fisheries areas and natural resource conservation (Budzych-Tabor, 2014). In principle, FLAGs offer an opportunity to support small-scale fisheries (Linke *et al.*, 2022). However, FLAGs practices are highly diverse across the EU and both budgets and the implementation of FLAGs vary between member states (Budzych-Tabor, 2014; Bugeja-Said *et al.*, 2022). As a result, the outcomes of FLAGs for small-scale fisheries have varied between states and they have not always contributed to the interests of small-scale fishers (e.g. Bugeja-Said *et al.*, 2022; Salmi *et al.*, 2022).

The literature on FLAGs has had a limited focus in the comparator countries, thus limiting the opportunities for analysis. Sweden is commonly presented as an example of failed FLAGs implementation (e.g. Bugeja-Said *et al.*, 2022; Salmi *et al.*, 2022). While FLAGs have provided the first platform for dialogue for all fisheries stakeholders in some areas of Sweden (Budzych-Tabor, 2014), FLAGs have failed to contribute to the development of small-scale fisheries and the interests of small-scale fisheries are compromised by the interests of more organised and powerful sectors such as tourism and large-scale fisheries (Bugeja-Said *et al.*, 2022; Salmi *et al.*, 2022). This is due to the integration of FLAGs into the broader LEADER programme, an EU initiative supporting broader project development, that weakened the support for small-scale fisheries (Salmi *et al.*, 2022). In Denmark, FLAGs have succeeded in new market innovation, niche product development, and job creation (Bugeja-Said *et al.*, 2022). However, the institutional design of FLAGs does not explicitly consider the inclusion of small-scale fisheries, and small-scale fisheries are a minority in Danish FLAG boards and lack a real voice (Bugeja-Said *et al.*, 2022).

The literature on comparator countries demonstrates limited success of FLAGs on supporting small-scale fisheries. However, the general literature on FLAGs suggests that they have been successfully implemented to benefit small-scale fisheries in Finland (Bugeja-Said *et al.*, 2022; Salmi *et al.*, 2022). This is nevertheless beyond the geographic scope of this literature review.

2.4.4. Marine spatial planning

Marine spatial planning, or marine planning, is an example in which many stakeholders can participate in managing the sea, which could aid a just transition. Marine spatial planning internationally has been recognised as a practice to support the growth of offshore renewables and creating synergies in marine spaces by supporting decision-making processes, involving stakeholders in planning, improving user compatibility and providing access to information (Quero García *et al.*, 2019; Tsai *et al.*, 2022). While marine spatial planning is not the focus of this literature review, literature on the topic emerged inevitably as a result of the competing interests over marine space, particularly in the context of increasing development of marine renewables in the North Sea. This section does not aim to provide an in-depth exploration of marine spatial planning in the context of all marine sectors. Rather, it explores the dimensions of marine spatial planning directly related to offshore renewables and fisheries. Marine spatial planning in the UK context is discussed in [1.4.3.1.1. Marine spatial planning](#).

The key marine spatial planning issues identified in the literature in the context of fisheries and renewable energy include: fair distribution of marine space, stakeholder participation in decision-making, and compensation measures for groups negatively impacted by marine spatial planning measures. This section focuses on multi-use and co-location as practices to mitigate negative impacts that the transition to net-zero in the marine environment can cause to other marine users. Communities of Practice (COP) are introduced as a possible alternative. Compensation measures have been covered under [2.4.1.3. Offshore wind](#).

2.4.4.1. Multi-use and co-location

Several different industries, including offshore wind, fisheries and aquaculture are competing over the use of the same marine space internationally (Douvere and Ehler, 2009; Knol-Kauffman *et al.*, 2023; Stelzenmüller *et al.*, 2016). Marine spatial planning approaches where multiple actors share access to the same marine areas are commonly referred to as multi-use or co-location strategies (Owusu Bonsu *et al.*, 2024; Schupp *et al.*, 2021; Steins *et al.*, 2021). Details surrounding co-location, and the difficulties and benefits associated with such an approach, are provided in the domestic review, in [1.4.3.4. Co-location](#).

Current international multi-use and co-location policies are strongly centred around offshore wind and fisheries (see boxes below), and the learning opportunities from international policy are thus strongly limited to these sectors. The boxes below provide details of policies in the UK and in international comparator countries on co-location and multi-use strategies. Co-location measures for fisheries during the installation stage of offshore wind follow similar patterns of 500m safety distance internationally (Owusu Bonsu *et al.*, 2024). However, the co-location strategies post-installation vary widely between states, consisting of different implementations of safety zones, stakeholder access to these spaces, and the availability of compensation measures for fishers to mitigate the loss of income as a result of offshore developments. In comparison to the comparator countries, the literature reviewed suggests that the UK has very flexible policy measures for multi-use

between offshore wind and fisheries. Co-location in the UK context is discussed in [1.4.3.4. Co-location](#) and as a solution in [1.4.4.3. Encourage co-location](#). While it has been reported that some fishers avoid fishing in close proximity to windfarms due to safety risks and access to insurance (Chaji and Werner, 2023; Gray *et al.*, 2016), there are no mandatory safe zones or gear regulations that are prevalent in many of the comparator countries. Furthermore, Schultz-Zehden *et al.*, (2018) report that Scotland's National Marine Plan encourages co-location between offshore wind and fisheries, where it makes good use of space (Scottish Government, 2015; Schultz-Zehden *et al.*, 2018). As such, from the literature reviewed it appears that co-location in terms of access is encouraged more extensively in the UK in comparison to the comparator countries.

Offshore wind and fisheries co-location policies in international comparator countries

UK

Policy regimes support fishing within offshore windfarms (Schupp *et al.*, 2021). No mandatory safety zones are implemented during operation, but the developer may apply for 50m safety zones around windfarm piles (Owusu Bonsu *et al.*, 2024). Fishing is allowed on the basis of individual agreements with offshore developers (Owusu Bonsu *et al.*, 2024).

Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW) was set up to establish good relations for fishers and offshore wind (Tsai *et al.*, 2022) and develop best practice for co-existence and mitigation for offshore renewables and fishing (Schultz-Zehden *et al.*, 2018).

Denmark

No mandatory safety zones are implemented, but cable protection zones covering the windfarm and additional 200m around cables may be applied (Owusu Bonsu *et al.*, 2024). Bottom trawling is allowed based on individual agreements (Owusu Bonsu *et al.*, 2024).

The Netherlands

Area passports consisting of 500m safety zones around windfarms are implemented during operation (Owusu Bonsu *et al.*, 2024). A 250m multi-use zone is implemented around monopiles and the sides of infield cables (Owusu Bonsu *et al.*, 2024).

Access of boats is allowed in specific windfarms with strict requirements regarding size of the vessel, access hours, minimum distances of physical infrastructure, communication devices, and fishing gear regulations (see Schultz-Zehden *et al.*, 2018)

Germany

150m safety zone from the outer buffer during operation (Owusu Bonsu *et al.*, 2024). The transit of small fishing vessels is restricted in speed and subject to weather (Owusu Bonsu *et al.*, 2024).

Belgium

Safety zones are implemented (Owusu Bonsu *et al.*, 2024). Fishing within offshore wind developments is generally not allowed, with the exception of passive fishery in specific areas (Owusu Bonsu *et al.*, 2024). Exceptions have been made for research purposes (Schultz-Zehden *et al.*, 2018).

Norway

No defined safety zones are implemented, but up to 500m safety zones may be applied by the Norwegian Coastal Association (Owusu Bonsu *et al.*, 2024). Fishing is allowed in cable areas (Owusu Bonsu *et al.*, 2024).

Sweden

No mandatory safety zones are implemented, but the developer may apply for 50m safety zones around windfarm piles (Owusu Bonsu *et al.*, 2024).

General multi-use strategies in international comparator countries

UK

Multi-use is part of national legislation and it happens at individual administrative decision level (Schultz-Zehden *et al.*, 2018).

The UK Marine Policy Statement requires consideration for social and economic impacts of offshore wind of fishing and encourages co-existence strategies for offshore wind and other marine users (Schultz-Zehden *et al.*, 2018).

Denmark

EU countries are required to develop marine spatial plans and consider opportunities for co-location (Schultz-Zehden *et al.*, 2018). Multi-use is part of national legislation (Schultz-Zehden *et al.*, 2018).

The Netherlands

EU countries are required to develop marine spatial plans and consider opportunities for co-location (Schultz-Zehden *et al.*, 2018). Multi-use is part of national legislation and it happens at individual administrative decision level (Schultz-Zehden *et al.*, 2018).

It is voluntary for offshore wind developers to allow multi-use (Steins *et al.*, 2021). Multi-use is not compulsory or incentivised in the tendering process for offshore wind (Steins *et al.*, 2021).

Communities of practice are used to support more inclusive MSP.

Germany

EU countries are required to develop marine spatial plans and consider opportunities for co-location (Schultz-Zehden *et al.*, 2018). Multi-use is part of national legislation, but it happens at individual administrative decision level in the region of Mecklenburg-West Pomerania (Schultz-Zehden *et al.*, 2018).

Under the German Marine Spatial Plan, different marine spatial users are given priority areas where uses that are not compatible with the priority are not permitted (Schupp *et al.*, 2021). Priority areas for offshore wind are subject to strict safety regulations and exclude most other users (Schupp *et al.*, 2021). Uses such as aquaculture are only allowed if they do not intervene with general maintenance of offshore wind (Schultz-Zehden *et al.*, 2018). Fisheries do not have priority areas due to the changing fishing grounds and they are instead given special considerations in the priority areas of other users (Schupp *et al.*, 2021).

Belgium

EU countries are required to develop marine spatial plans and consider opportunities for co-location (Schultz-Zehden *et al.*, 2018). Multi-use is part of national legislation and it happens at individual administrative decision level (Schultz-Zehden *et al.*, 2018).

Multi-use opportunities are identified through a zoning system that defines zones in which practices such as aquaculture can take place within offshore wind developments (Schultz-Zehden *et al.*, 2018). Multi-use is subject to strict environmental conditions (Schultz-Zehden *et al.*, 2018).

Norway

The ocean management system does not include cross-sectoral marine spatial planning beyond oil and gas (Knol-Kauffman *et al.*, 2023).

Sweden

EU countries are required to develop marine spatial plans and consider opportunities for co-location (Schultz-Zehden *et al.*, 2018). Multi-use is part of national legislation and it happens at individual administrative decision level (Schultz-Zehden *et al.*, 2018).

2.4.4.2. Communities of Practice (COP)

Traditional marine spatial planning has been criticised in the literature due to a perceived lack of meaningful participation from all relevant stakeholders (Steins *et al.*, 2021; Stelzenmüller *et al.*, 2016). The power imbalances, particularly in the context of small-scale fisheries and renewable energy, have been highlighted alongside questions of who participates, who makes decisions, and who benefits from marine spatial planning (Stalmokaitė *et al.*, 2023; Stelzenmüller *et al.*, 2016). All three questions are important to deliver a just transition in partnership with those impacted by the marine energy transition. A complementary practice to marine spatial planning has been adopted in The Netherlands through developing Communities of Practice (see case study), which bring together stakeholders working in the area of multi-use pilots.

Communities of Practice in The Netherlands

As a result of various competing interests for the use of scarce marine space, the Ministry of Agriculture, Nature and Food Quality in The Netherlands initiated a Dutch Community of Practice North Sea (COPNS) as a way to share experiences of multi-use in marine space, learn from each other and stimulate the development of multi-use pilots (Steins *et al.*, 2021). The COPNS was a community of policymakers and practitioners and focused specifically on balancing the spatial needs of offshore wind, conservation and marine food production (Steins *et al.*, 2021). The meetings were tailored around government interest in their North Sea 2030 strategy.

COPNS were seen as an opportunity to encourage cooperation between stakeholders by creating a positive environment to address practical challenges related to the expansion of offshore wind, develop relationships between stakeholders and gain experience in marine multi-use (Steins *et al.*, 2021). In contrast to traditional marine spatial planning, COP are seen as providing a more participatory platform to encourage cooperation in marine space by involving a variety of stakeholders including government representatives, researchers, NGOs and businesses (Government of The Netherlands, 2022, Steins *et al.*, 2021).

With a limited amount of literature in English, evidence gaps exist surrounding COPNS and the impacts that the policy had on marine spatial planning in The Netherlands. COPs offer an opportunity to engage with different interest groups in the marine space and can be formatted around government or community leadership depending on the objectives of the COP. With COPs already being integrated in Scotland's marine science and innovation strategy (see Scottish Government, 2024), these could be utilised for the delivery of COPs in other topics related to a marine just transition.

2.4.5. Other sectors

Other sectors and topics that were identified as relevant for a marine just transition during the initial literature search included:

- Coastal communities and coastal management
- Blue economy
- Marine protected areas and conservation
- Aquaculture
- Fossil fuels (including workers and carbon capture and storage)
- Ports and shipping

Whilst these sectors are all relevant to the context of a marine just transition, they received different levels of coverage in the literature. Besides offshore renewables and fisheries that were the focus of this literature review, coastal communities emerged as a key topic in initial literature searches. The secondary themes consisted of marine spatial planning, blue economy, MPA and conservation, aquaculture and, fossil fuels (including workers and carbon capture and storage), and ports and shipping. The division between the sectors is highly artificial and made for the sake of practicality. In reality, these sectors and topics are strongly interlinked and rarely addressed in isolation from one another. Evidence gaps exist surrounding understanding how the remaining sectors interlink with a marine just transition in the sectors covered in this literature review.

2.5. Conclusion

This literature review has investigated the existing policy practices on marine just transition in an international context, specifically focusing on marine renewable energy and fisheries. It has identified existing international just transition oriented policy practices, their relationship with the objectives of the Scottish Government's just transition strategy, and highlighted international policy practices that Scotland could learn from.

It was discovered that despite the large amount of existing international just transition oriented literature, there is a limited amount of literature that specifically addressed policy practices. This is likely a result of one or more of the following factors: nascent industries with limited policies in place, emerging policy practices with limited evidence of their success, policy evaluations written in the native languages of the comparator countries, and/or a lack of evaluative research in general.

The key findings of this review of evidence from international comparators are:

- Scotland is perceived to be one of the leading countries in offshore renewables development which limits the learning opportunities from other countries with similar marine spaces.
- Key just transition policies in the international context include community benefits, community ownership and compensation measures from offshore renewables; local action groups for fisheries; and multi-use and co-location in marine spatial planning.
- All marine sectors are deeply intertwined as a result of sharing the same marine space and one sector cannot be considered in separation from the others.
- Offshore wind
 - In the context of offshore renewables, a just transition is strongly centered around the distribution of benefits from renewable energy developments and the mitigation of negative impacts on other marine users.
 - Scotland is perceived by some academics to have advanced community benefit policies for offshore wind and the literature reviewed recommends maintaining the current model over alternative international examples.
 - Other nations have more experience with offshore energy community ownership, and there is strong potential to learn from both international offshore and domestic onshore practices.
 - Compensation measures from offshore developments are most commonly in place for fisheries, but there is a lack of evidence on best practices.
- Wave and tidal energy

- There are limited examples of existing just transition oriented policies on wave and tidal energy, although the need for these policies is recognised.
- Best practice can be learned from Canada with extensive policies on local participation and stakeholder engagement.
- Fisheries
 - Just transition for fisheries include better access to decision-making processes and community involvement.
 - While all fisheries are facing challenges, small-scale fisheries are identified as a particularly vulnerable group.
 - Best learning opportunities for Scotland in fisheries are inclusive stakeholder engagement in decision-making.
 - Fisheries local action groups support area-based development for fishers but the international examples have had limited success in contributing to the interest of small-scale fisheries.
- Marine Spatial Planning
 - Multi-use and co-location practices could be useful tools to accommodate for increasing competition in the marine space but there are evidence gaps with regards to the data, technology, policy, regulatory frameworks and incentives to deliver them.
 - The focus of multi-use is primarily on offshore wind and fisheries, with the UK demonstrating more flexible arrangements than most of the comparator countries.

Final summary

These related literature reviews have presented a wealth of evidence from the UK and international comparator countries on a just transition for marine sectors and coastal communities. Although the UK based review has provided a broad focus on impacts and measures to support a marine just transition for Scottish coastal communities and marine sectors, the international review provided a depth of understanding regarding policies on marine renewable energy and fisheries in international countries which could provide further learning for Scotland.

Some key learnings have emerged from both reports:

- The concept of a marine just transition is relatively new and therefore there is limited focus on it in the existing academic and policy literature in the UK and internationally. However, it is likely to be of a growing focus as we move towards biodiversity and climate change goals and have to navigate how we reach these in a just way.
- There are significant evidence gaps in relation to a marine just transition in the UK and internationally. Some areas of interest that are likely to be affected as we move towards climate and biodiversity goals have had very limited research on their impacts on people (e.g. aquaculture/ marine tourism/ wave and tidal energy) or on measures which could mitigate these impacts. Both in the UK and internationally, there is a very limited amount of literature that evaluates policy practices.
- Marine sectors are deeply entwined, and as we move towards climate and biodiversity goals competition for marine space and increased use of the seas is likely to lead to greater entanglement. These sectors therefore need to be approached together in order to provide realistic and useful solutions for addressing any challenges that arise. Impacts or measures on one industry will likely affect another.
- Both reviews have found consensus on a range of policy measures which could help to enable a marine just transition. These include wealth building of local communities (community benefits, community ownership and fisheries compensation), co-location, and improved participation and communication. Although some of these topics have been explored further internationally than in the UK (e.g. community ownership and co-location), these reviews have highlighted that there are evidence gaps surrounding these potential measures and their impacts.
- Findings related to each of these potential policy measures are highlighted in turn:
 - Wealth building – providing opportunities for coastal communities to build their wealth (skills/ resources) could increase their resilience as changes affect them. Upskilling and supporting diversification of local communities could lead to greater resilience and adaptation. A range of community benefit schemes have been implemented in the UK and internationally. Fisheries compensation schemes have also been

implemented. UK schemes may require greater guidance to ensure these lead to fair outcomes for coastal communities and marine sectors. Some academics within the international review suggest that a voluntary approach to community benefits is appropriate within the UK. Community ownership of offshore renewables has not been explored in the UK but international examples (e.g. in Denmark and Germany) could provide models for future UK actions.

- Co-location – the UK literature highlights that co-location could enable multiple industries to co-exist in areas of the sea, helping to address concerns regarding competition for marine space, however there are considerable barriers stopping this from occurring (liability, insurance, and safety concerns). The government could support research into addressing these concerns, could make exploring co-location a requirement of licensing for offshore developments, and good practice guidance could be created to help inform developers. Co-location is required to be considered in the EU but firmer spatial restrictions regarding fishing in offshore windfarms prohibit co-location from occurring between fishers and offshore wind developments in most comparator countries.
- Improved participation and communication – the UK review has highlighted that improved engagement and participation opportunities could improve the capacity and participation of a range of stakeholders in marine management, potentially leading to greater buy-in and trust in policy decisions. Co-management could provide benefits to marine governance, enabling fishers and other community members to participate in decisions that affect them. Sweden provides useful examples of a bottom-up approach to stakeholder participation, with communities of practice and fisheries local action groups providing additional insight to participation.

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Appendices

Appendix A: UK review - search strings

- (Coast OR Ocean OR Sea) AND (empower* OR resilien* OR inclus* OR adapt) AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- (Fish* OR aquaculture) AND (empower* OR resilien* OR inclus* OR adapt) AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- (“Offshore Oil” OR “Offshore Gas” OR “Offshore Carbon capture” OR “Offshore CCS”) AND (empower* OR resilien* OR inclus* OR adapt) AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- (Tidal OR Wave OR "Offshore Wind" OR "Offshore Renewables") AND (empower* OR resilien* OR inclus* OR adapt) AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- Marine AND (equ* OR inequ* OR injust* OR unjust OR fair*) AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- (Coast OR Ocean OR Sea) AND (equ* OR inequ* OR injust* OR unjust OR fair*) AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- (Fish* OR aquaculture) AND (equ* OR inequ* OR injust* OR unjust OR fair*) AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- (“Offshore Oil” OR “Offshore Gas” OR “Offshore Carbon capture” OR “Offshore CCS”) AND (equ* OR inequ* OR injust* OR unjust OR fair*) AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- (Tidal OR Wave OR "Offshore Wind" OR "Offshore Renewables") AND (equ* OR inequ* OR injust* OR unjust OR fair*) AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- (Marine OR Coast OR Ocean OR Sea) AND hydrogen AND Just Transition AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- (Marine OR Coast OR Ocean OR Sea) AND hydrogen AND (“Blue Justice” OR "climate justice" OR "environmental justice" OR "energy justice" OR "social justice") AND (“United Kingdom” OR “Great Britain” OR Scotland OR England OR Wales OR “Northern Ireland”)
- (Marine OR Coast OR Ocean OR Sea) AND hydrogen AND (“community ownership" OR "community benefits" OR "community particip*" OR

"community engag*" AND ("United Kingdom" OR "Great Britain" OR Scotland OR England OR Wales OR "Northern Ireland")

- (Marine OR Coast OR Ocean OR Sea) AND hydrogen AND (empower* OR resilien* OR inclus* OR adapt) AND ("United Kingdom" OR "Great Britain" OR Scotland OR England OR Wales OR "Northern Ireland")
- (Marine OR Coast OR Ocean OR Sea) AND hydrogen AND (equ* OR inequ* OR injust* OR unjust OR fair*) AND ("United Kingdom" OR "Great Britain" OR Scotland OR England OR Wales OR "Northern Ireland")
- Blue economy AND ("Just Transition" OR ("Blue Justice" OR "climate justice" OR "environmental justice" OR "energy justice" OR "social justice") OR ("community ownership" OR "community benefits" OR "community partici*" OR "community engagement*") OR (empower* OR resilien* OR inclus* OR adapt) OR (equ* OR inequ* OR injust* OR unjust OR fair*)) AND ("United Kingdom" OR "Great Britain" OR Scotland OR England OR Wales OR "Northern Ireland")
- (Marine OR Coast OR Ocean OR Sea OR fish* OR aquaculture) AND ("marine protected area" OR protection OR restoration OR "MPA" OR closure OR "management measures" OR conservation OR biodivers*) AND ("Just Transition" OR ("Blue Justice" OR "climate justice" OR "environmental justice" OR "energy justice" OR "social justice" OR mitigation OR "fisheries management") OR ("community ownership" OR "community benefits" OR "community partici*" OR "community engagement*") OR (empower* OR resilien* OR inclus* OR adapt) OR (equ* OR inequ* OR injust* OR unjust OR fair*))
- ("marine protected area" OR "marine protection" OR "marine restoration" OR "MPA" OR "marine closure" OR "fish* closure" OR "marine management measures" OR "fish* management" OR "fish* mitigat*" OR "marine mitigat*" OR "marine conservation" OR "marine biodivers*") AND ("Just Transition" OR ("Blue Justice" OR "climate justice" OR "environmental justice" OR "social justice") OR (ownership OR benefits OR partici* OR engagement*) OR (empower* OR resilien* OR inclus* OR adapt) OR (equ* OR inequ* OR injust* OR unjust OR fair*))

Appendix B: UK review - policy searches

- Scottish Government Marine Just Transition
- UK Government Marine Just Transition
- Welsh Government Marine Just Transition
- Northern Ireland Government Marine Just Transition
- Scottish Government Just Transition
- UK Government Just Transition
- Welsh Government Just Transition
- Northern Ireland Government Just Transition
- Marine management organisation Just Transition

Appendix 1: International review - search terms

- “Just Transition” AND Marine
- “Just Transition” AND (Offshore Wind” OR “Offshore Renewables”)
- “Just Transition” AND (wave OR tidal)
- “Just Transition” AND (“offshore CCS” OR “offshore carbon capture” OR “offshore hydrogen”)
- “Just Transition” AND (fishing OR fisher* OR aquaculture OR mariculture)
- “Just Transition” AND “blue economy”
- “Just Transition” AND Coast*
- “Just Transition” AND (sea* OR ocean*)
- Blue justice
- ("climate justice" OR "energy justice" OR "environmental justice") AND Marine
- ("climate justice" OR "energy justice" OR "environmental justice") AND (Offshore Wind” OR “Offshore Renewables” OR wave OR tidal)
- ("climate justice" OR "energy justice" OR "environmental justice") AND (“offshore CCS” OR “offshore carbon capture” OR “offshore hydrogen”)
- ("climate justice" OR "energy justice" OR "environmental justice") AND (fishing OR fisher* OR aquaculture OR mariculture)
- ("climate justice" OR "energy justice" OR "environmental justice") AND “blue economy”
- ("climate justice" OR "energy justice" OR "environmental justice") AND (Coast* OR sea* OR ocean*)
- Marine justice
- ("climate justice" OR "energy justice" OR "environmental justice " OR "blue justice" OR "just transition") AND ("offshore oil" OR "offshore gas")
- ("community ownership" OR "community benefits" OR "community particip*" OR "community engag*") AND marine
- ("community ownership" OR "community benefits" OR "compensation") AND (Offshore Wind” OR “Offshore Renewables” OR “wave energy” OR “tidal energy”)
- ("community ownership" OR "community benefits" OR "compensation") AND (“offshore CCS” OR “offshore carbon capture” OR “offshore hydrogen”)
- ("community ownership" OR "community benefits" OR "compensation") AND (fishing OR fisher* OR aquaculture OR mariculture)
- ("community ownership" OR "community benefits" OR "compensation") AND “blue economy”

- (equ* OR inequ* OR injust* OR unjust OR fair*) AND marine
- (equ* OR inequ* OR injust* OR unjust OR fair*) AND (Offshore Wind” OR “Offshore Renewables” OR “wave energy” OR “tidal energy”)
- (equ* OR inequ* OR injust* OR unjust OR fair*) AND (fishing OR fisher* OR aquaculture OR mariculture)
- (empower* OR resilien* OR inclus*) AND (Offshore Wind” OR “Offshore Renewables” OR “wave energy” OR “tidal energy”)
- (empower* OR resilien* OR inclus*) AND (fishing OR fisher* OR aquaculture OR mariculture)
- (empower* OR resilien* OR inclus*) AND marine
- (Offshore Wind” OR “Offshore Renewables” OR "offshore energy" OR “wave energy” OR “tidal energy” OR “marine renewables" OR "marine energy") AND transition
- (Offshore Wind” OR “Offshore Renewables” OR “wave energy” OR “tidal energy” OR “marine renewables) AND benefits

How to access background or source data

The data collected for this <statistical bulletin / social research publication>:

- are available in more detail through Scottish Neighbourhood Statistics
- are available via an alternative route <specify or delete this text>
- may be made available on request, subject to consideration of legal and ethical factors. Please contact <email address> for further information.
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