TRANSECTS
Transitions in Energy for Coastal Communities over Time and Space

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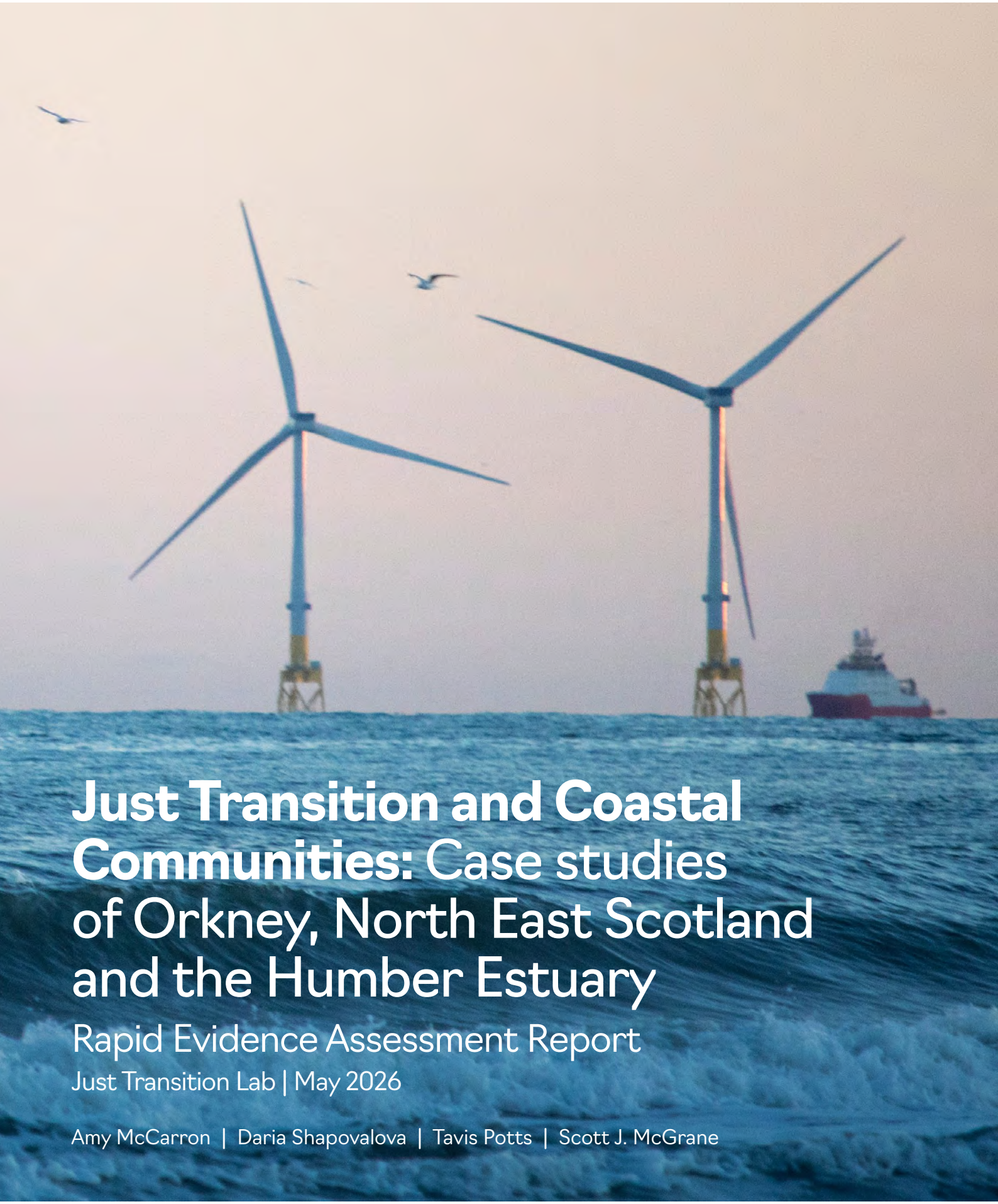

Just Transition and Coastal Communities: Case studies of Orkney, North East Scotland and the Humber Estuary

Rapid Evidence Assessment Report

Just Transition Lab | May 2026

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Executive summary

Marine Energy Transitions (METs) are reshaping coastal regions across the UK, offering opportunities for decarbonisation and economic renewal but also risking the reinforcement of long-standing inequalities. This Rapid Evidence Assessment (REA) synthesises 181 sources to examine how the concept of just transition has been and is framed, governed, and experienced in three coastal case studies: Orkney, North East Scotland, and the Humber Estuary. Across all regions, communities encounter METs not as isolated moments of change but as cumulative transitions shaped by the legacies of earlier maritime and energy industries. These legacies influence current vulnerabilities, patterns of economic dependency, and the distribution of burdens and benefits.

The evidence shows that governance of marine energy remains largely centralised and reactive, weakening local influence over planning and creating procedural injustices, especially where communities face the impacts of development without meaningful roles in shaping it. Burdens such as housing pressure, service strain, cultural disruption, and loss of access to marine space tend to fall locally, while many economic benefits flow to distant supply chains and investors. Mechanisms for retaining value - through community benefit schemes, ownership models, or statutory obligations - are inconsistent and limited for marine renewable energy.

Cultural identity and sense of place play a critical role in how coastal communities understand fairness. Histories tied to fishing, seafaring, and marine industries shape expectations of what coastal futures should look like. Transitions that disrupt these identities or change coastal landscapes can be perceived as unjust even when economic gains accompany them. Participation challenges further compound inequities, and many coastal communities lack the financial, technical, or organisational capacity to engage effectively in complex planning processes, leading to tokenistic consultation and reduced trust.

With processes already underway in the UK that will shape current and future offshore energy policy and regulatory reform, this review provides an evidence-base grounded in the experiences of coastal communities at the centre of METs. The findings highlight clear opportunities for more equitable transitions.

Anticipatory, place-based planning could help address cumulative impacts and avoid repeating boom–bust cycles. Stronger coordination across governance levels - supported by stable structures that link local knowledge with regional and national decision-making - could improve alignment between policy ambitions and coastal realities. More consistent and transparent approaches to community benefit would help ensure value generated from marine energy resources is shared locally. Long-term investment in community capacity and leadership is also essential to ensure communities can participate on equal footing and shape transition pathways that reflect local priorities, identities, and aspirations.

The evidence demonstrates that without deliberate action, METs risk reproducing historical inequalities rather than addressing them. Delivering a just transition for coastal communities requires governance that is place-responsive, participatory, and attentive to the interlinked dimensions of distributive, procedural, recognitional, and restorative justice.

Abbreviations

CCUS	Carbon Capture, Utilisation, and Storage
CFP	Common Fisheries Policy
DESNZ	Department for Energy Security and Net Zero
EEC	European Economic Community
EFF	European Fisheries Fund
EMEC	European Marine Energy Centre
FIFG	Financial Instrument for Fisheries Guidance
HICP	Humber Industrial Cluster Plan
HSE	Health and Safety Executive
IWC	International Whaling Commission
JNCC	Joint Nature Conservation Committee
METs	Marine Energy Transitions
MMO	Marine Management Organisation
MSP	Marine Spatial Planning
NESDA	North East Scotland Development Authority
N-RIF	National Renewables Infrastructure Fund
NSTA	North Sea Transition Authority
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
ORE	Offshore Renewable Energy
OWIC	Offshore Wind Industry Council
REA	Rapid Evidence Assessment
UKCS	United Kingdom Continental Shelf
UKRI	United Kingdom Research and Innovation

Glossary

Blue Economy	Economic activities linked to oceans and seas that aim to balance economic growth with environmental sustainability and social wellbeing.
Boom–Bust Cycles	Patterns of rapid economic expansion followed by sharp contraction, commonly associated with resource-dependent and extractive industries.
Distributive Justice	The fairness of how social, economic, and environmental costs and benefits of energy transitions are distributed across groups, places, and generations.
Just Transition	Just Transition refers to a fair distribution of burdens and benefits as we transition to a low-carbon economy. Precise definition and scope of Just Transition will vary depending on context. A narrower definition of Just Transition focuses on workers, owing to the term's origin from United States trade unions in the 1980s. A wider approach emerged, particularly in academia, bringing together all elements of society in transition, and encompassing energy, climate, and environmental justice.
Low-carbon energy	Energy produced with lower greenhouse gas emissions over its lifecycle compared to conventional fossil fuels like coal, oil, and gas. Marine renewable energy is a type of low-carbon energy.
Marine Energy Transitions (METs)	Successive shifts in the use of marine and coastal environments for energy production, including historical extractive industries (e.g. whaling, oil and gas) and contemporary renewable and low-carbon technologies.
Marine Spatial Planning (MSP)	A public process for analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives.
Natural Capital	The "part of nature which directly or indirectly underpins value to people, including ecosystems, species, freshwater, soils, minerals, the air and oceans, as well as natural processes and functions". [1]
Procedural Justice	The extent to which decision-making processes are inclusive, transparent, and allow meaningful participation by affected communities.
Recognitional Justice	The acknowledgement and respect of diverse identities, values, knowledges, and lived experiences, particularly those historically marginalised in governance processes.
Restorative Justice	An approach to justice that seeks to address and repair historical harms and legacies of past extractive or exclusionary practices.
ScotWind	ScotWind was the name given to the process of leasing Scotland's seabed – operated by Crown Estate Scotland - to companies wanting to build offshore wind farms in Scottish water. It resulted in 20 projects securing seabed rights.

[1] NCC, 'The State of Natural Capital: Towards a Framework for Measurement and Valuation' (2013) <https://www.gov.uk/government/publications/natural-capital-committees-first-state-of-natural-capital-report> Accessed 8 February 2026.

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1. Background and scope

The transition from fossil fuels to sustainable and renewable energy systems is an urgent and necessary part of climate change mitigation. Globally, governments face growing pressure to accelerate decarbonisation in line with international commitments. Energy transitions are increasingly recognised as central not only to tackling greenhouse gas emissions but also to delivering long-term economic resilience and energy security. [2]

In the United Kingdom (UK), a major energy transition is currently underway, with several overlapping drivers pushing this shift. UK Continental Shelf (UKCS) oil and gas reserves, which have underpinned the UK's energy economy since the 1970s, peaked in 1999 and have been in long-term decline since, with production becoming increasingly costly. [3]

Renewable and low-carbon energy sources are increasing, but current capacity and infrastructure remain insufficient to guarantee energy security. This challenge is compounded by geopolitical events and volatility in global energy markets. At the same time, international treaties, such as the Paris Agreement, have committed the UK to ambitious emissions reductions, while domestic policy has set legally binding targets on achieving Net Zero by 2050 (2045 in Scotland). [4]

Coastal and marine regions are central to this transition. Historically, these regions have hosted extractive and energy-intensive industries such as whaling, fishing, and, more recently, offshore oil and gas. These industries have not only shaped local economies but have also played central roles in national energy security and industrial development. [5]

Today, many of the same regions are becoming focal points for renewable and low-carbon energy technologies, including offshore wind, tidal and wave power, hydrogen production, and carbon capture and storage. [6] These developments present significant opportunities. They can contribute to decarbonisation, strengthen energy security, and generate economic benefits through direct and supply chain job creation, investment in infrastructure, and technological innovation.

However, past transitions have shown that changes in maritime economies create specific challenges and vulnerabilities for coastal regions and communities. [7] These communities have faced the instability of boom–bust economic cycles, persistent inequalities, and pressures on housing and local services associated with rapid industrial change. [8] Benefits have not always been evenly distributed, with many coastal areas experiencing long-term economic fragility

[2] Paris Agreement 2015; International Energy Agency, 'Net Zero by 2050: A Roadmap for the Global Energy Sector' (2021) <https://iea.blob.core.windows.net/assets/4719e321-6d3d-41a2-bd6b-461ad2f850a8/NetZeroby2050-ARoadmapfortheGlobalEnergySector.pdf> Accessed 2 July 2024.

[3] Scottish Affairs Committee, 'The Future of Scotland's Oil and Gas Industry' (2025) <https://publications.parliament.uk/pa/cm5901/cmselect/cmscotaf/459/report.html> Accessed 26 November 2025.

[4] UK Government, 'UK's 2035 Nationally Determined Contribution (NDC) Emissions Reduction Target under the Paris Agreement' <https://www.gov.uk/government/publications/uks-2035-nationally-determined-contribution-ndc-emissions-reduction-target-under-the-paris-agreement> Accessed 26 November 2025; Climate Change Act 2008; Climate Change (Scotland) Act 2009.

[5] Daria Shapovalova and others, 'Just Transition for Workers and Communities in Aberdeen and Aberdeenshire: Rapid Evidence Review' (Just Transition Lab 2023) Accessed 8 December 2025.

[6] See e.g., 'Regional Growth Prospectuses Show How UK Coastal Regions Can Secure Multi-Billion Pound Economic Boost from Offshore Wind Supply Chain Investments' (*The Crown Estate*, 19 May 2025) <https://www.thecrownestate.co.uk/news/regional-growth-prospectuses-show-how-UK-coastal-regions-can-secure-multi-billion-pound-economic-boost> Accessed 26 November 2025.

[7] Kamila Kazimierczuk and others, 'A Socio-Technical Assessment of Marine Renewable Energy Potential in Coastal Communities' (2023) 100 Energy Research & Social Science 103098.

[8] Mervyn Jones and Fay Godwin, *The Oil Rush* (quartet Books 1976); Kate Johnson, Sandy Kerr and Jonathan Side, 'Marine Renewables and Coastal Communities—Experiences from the Offshore Oil Industry in the 1970s and Their Relevance to Marine Renewables in the 2010s' (2013) 38 Marine Policy 491.

despite their central role in supplying national energy demand.[9] In recognition of these risks, international and national policy frameworks now place increasing emphasis on fairness, inclusion, and equity. "Just transition" has become a key concept in ensuring that the shift to low-carbon energy does not reproduce existing inequalities but instead creates opportunities that are more widely shared.[10]

While the conceptual literature on just transition is rich and multi-disciplinary,[11] there remains a lack of research "rooted in practice".[12] The need for more localised and community-level studies has been repeatedly highlighted, particularly in regions directly shaped by energy transitions.[13] Key questions remain around how inclusive and equitable transitions have been in practice, and what lessons can be learned from past experiences. Without a systematic overview, policymakers risk designing transitions that exacerbate inequalities and overlook community priorities. This report aims to inform policy and community engagement strategies to ensure just and equitable Marine Energy Transitions (METs) for coastal communities.

This report is prepared for the interdisciplinary TRANSECTS project (TRANSitions In Energy For Coastal Communities Over Time And Space), which examines shifts from non-renewable marine energy sources (whale oil in the 1800s through to offshore oil and gas in the later-1900s) to more sustainable renewable energy sources in the early-2000s.

Figure 1. TRANSECTS case study regions: Orkney (blue; northernmost), North East Scotland (yellow; middle), and the Humber region (green; southernmost).

By working directly with coastal communities and focusing on three areas of the UK (North East Scotland, the Humber Estuary, and Orkney; Figure 1) we assess the energy sources and natural capital, examine how nearby communities have been affected during transitions, and investigate the fairness and equity of decisions made.

[9] Shapovalova and others, 'Just Transition for Workers and Communities in Aberdeen and Aberdeenshire' (n 5) https://doi.org/10.57064/2164/19887.

[10] Climate Change (Scotland) Act 2009 sec 35; Daria Shapovalova and Eddy Wifa, 'The Role of Law in Enabling a Just Transition' (IUCN 2023) <https://www.iucn.org/resources/information-brief/role-law-enabling-just-transition> Accessed 13 April 2024; Vilja Johansson, 'Just Transition as an Evolving Concept in International Climate Law' (2023) 35 Journal of Environmental Law 229 https://doi.org/10.1093/jel/eqad017.

[11] Simone Abram and others, 'Just Transition: A Whole-Systems Approach to Decarbonisation' (2022) 22 Climate Policy 1033; Alex de Ruyter and Gill Bentley, 'Enabling a Just Transition' (2024) 19 Contemporary Social Science 1 https://doi.org/10.1080/21582041.2024.2360953; Xinxin Wang and Kevin Lo, 'Just Transition: A Conceptual Review' (2021) 82 Energy Research & Social Science 102291 https://doi.org/10.1016/j.erss.2021.102291; Raphael J Heffron, *Achieving a Just Transition to a Low-Carbon Economy* (Palgrave Macmillan 2021).

[12] Wang and Lo (n 11).

[13] Morgan D Bazilian and others, 'Expanding the Scope of Just Transitions: Towards Localized Solutions and Community-Level Dynamics' (2021) 80 Energy Research & Social Science 102245 https://doi.org/10.1016/j.erss.2021.102245.

The main objectives of this report are:

- To understand the framing and meaning of "just transition" in coastal communities, particularly in the context of METs;
- To develop an evidence-base for the project's three case studies focusing on the socio-economic impacts of METs, understandings of justice and fairness, and priorities for current and future governance.

The report uses the Rapid Evidence Assessment (REA) methodology which provides a systematic yet time-efficient approach to synthesising existing evidence. It aims to improve understanding of the historic and current evidence in academic and grey literature on justice in coastal communities in general, and in three cross-comparative case studies - North East Scotland, the Humber Estuary, and Orkney.

Each of these regions has a distinct history of marine energy development and offers valuable insights into the opportunities and risks of transitions. Through this methodology, the research team, guided by a dedicated steering group for the REA, has identified over 5,200 sources and, after screening, extracted evidence from 181 sources relevant to the report's objectives. This evidence base provides insight into past transitions and knowledge for future decision-making to ensure that METs are governed in ways that do not exacerbate the existing inequalities but instead support and recognise the priorities in the relevant coastal communities.

The rest of the report is thus structured as follows:

Section 2
provides a detailed overview of the REA methodology and how it was applied in this report.

Section 3
examines evidence on METs and justice, identifying coastal communities-relevant framing of "just transition", and outlining associated challenges and governance concerns.

Section 4
examines the Orkney case study focusing on its maritime history and the role of industries such as whaling, oil and gas and renewables.

Section 5
examines the North East Scotland case study, focusing on the area between Aberdeen and Fraserburgh, and its transitions from fisheries and shipping to oil and gas, and the current shift to offshore renewables and other industries.

Section 6
examines the Humber Estuary case study, focusing on the region's transition from traditional maritime and fishing industries centred around Hull and Grimsby, through its expansions of heavy industry, oil and gas along the wider estuary, to the current shift towards offshore renewables.

Section 7
synthesises the findings across the three case studies, providing cross-comparative analysis of the impacts of maritime transitions in the UK's coastal regions, identifying common challenges and opportunities, and highlighting place-based considerations for future research and engagement.

Section 8
concludes and outlines the main policy considerations.

2. Methodology and results overview

A REA was chosen as the methodological approach for this review as it provides a structured and transparent synthesis of existing evidence within a limited timeframe and under resource constraints (Figure 2).[14]

The REA process was conducted using the DEFRA-NERC Guide, which details a step-by-step methodology widely used in policy-relevant evidence appraisal research (Figure 3).[15] This approach enabled a balance between rigour and efficiency, reducing bias by using a pre-defined set of inclusion/exclusion criteria.

The REA serves two main purposes:

1. to establish a baseline understanding of the relevant themes; and
2. to identify knowledge gaps to guide subsequent research.

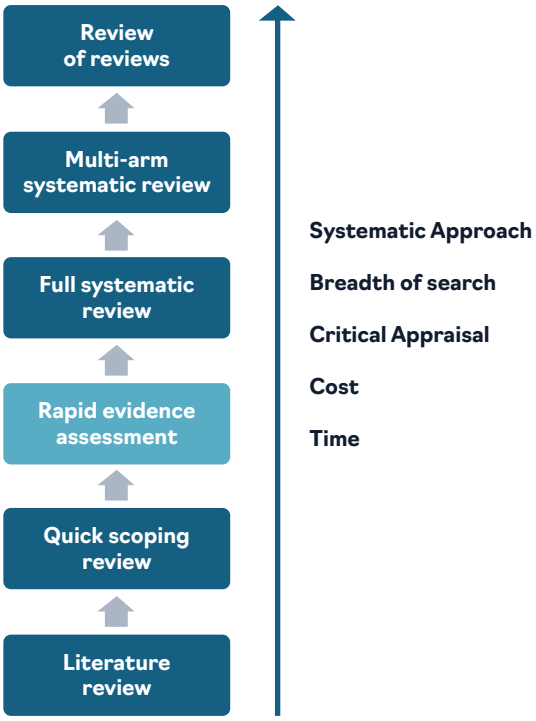


Figure 2. The position of Quick Scoping Reviews and Rapid Evidence Assessments in the hierarchy of evidence reviews, adapted from the Civil Service Guidance on Rapid Evidence Assessments.[16]

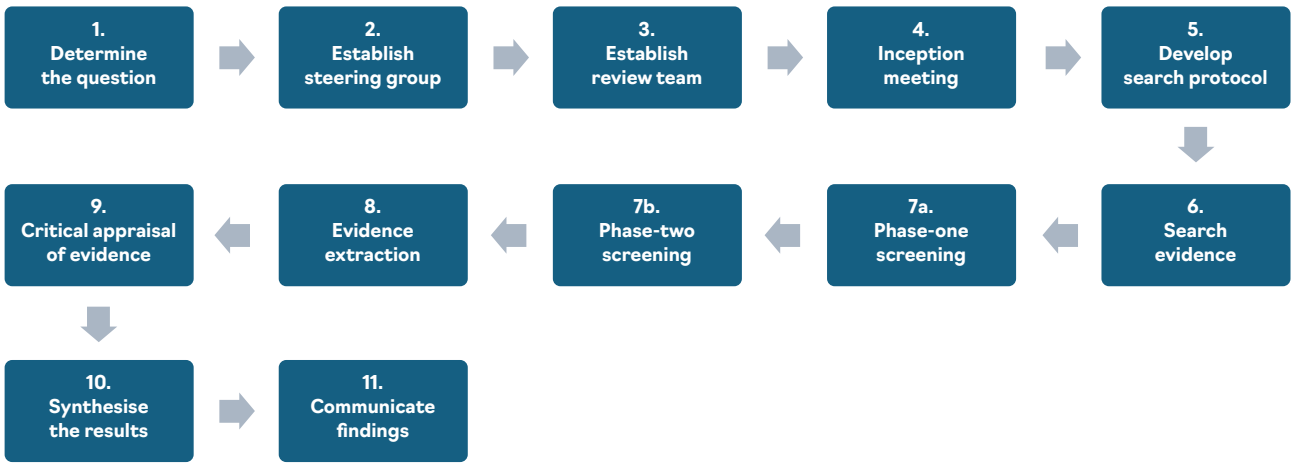


Figure 3. Rapid Evidence Assessment process.

[14] Alexandra Collins and others, 'The Production of Quick Scoping Reviews and Rapid Evidence Assessments: A How to Guide' (DEFRA, NERC 2015) <http://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/560521/Production_of_quick_scoping_reviews_and_rapid_evidence_assessments.pdf> Accessed 13 November 2025; Peter Warren, 'Evidence Reviews in Energy and Climate Policy' (2020) 16 Evidence & Policy 83 https://doi.org/10.1332/174426418x15193815413516.

[15] Collins and others (n 14); Warren (n 14); Sacha Alberici, Gemma Toop and Stephen Critchley, 'Bioenergy Heat Pathways to 2050 - Rapid Evidence Assessment' (Ekofys for DBEIS 2018) <https://www.gov.uk/government/publications/bioenergy-heat-pathways-to-2050-rapid-evidence-assessment> Accessed 13 April 2024.

[16] Reproduced from Collins and others (n 14).

A steering group was established comprising academics both within and external to the project, with relevant disciplinary expertise (i.e., marine socio-ecology, archaeology, history, biology, geography, economics), methodological expertise, and experience working in the case study regions, alongside practitioners working in heritage and marine planning. Their involvement helped to incorporate experiential knowledge, improve transparency, and reduce potential bias in the review process.

An inception meeting was held with the review team and steering group to agree on the review's context and aims, confirm research questions, and finalise the search strategy including search terms and databases. Search strings were kept consistent for each case study, with geographic keywords adapted as needed. Additional search terms were introduced based on the steering group's advice (e.g., "oil AND Orkney AND fund"). The review protocol was refined and approved by all members of the steering group.

Evidence searches were conducted using the agreed terms (Table 1) across the following databases and catalogues: Scopus, Google Scholar, Primo (Books+), Aberdeen City Libraries (Spydus), Aberdeenshire Libraries, Aberdeen City and Aberdeenshire Archive, Hull History Centre (including Hull City Archives, Hull University Archives and Hull Local Studies Library repositories), Orkney Library and Archive, the National Library of Scotland, the National Monuments Record of Scotland, the National Records of Scotland, The National Archives (England), and the British Library. Grey literature searches were conducted primarily through Google. Where search engines or catalogues could not process complex search strings, the search terms were adapted accordingly. Any modifications were reviewed by the steering group.

Table 1. Search terms for Rapid Evidence Assessment.

	Broader sector & location terms	Socio-economic/ governance terms	Additional targeted search
Marine energy transitions and just transition (MET&JT) (section 3)	(Marine OR offshore OR "coastal communit*") AND ("just transition" OR transition OR change) AND soci*	(Marine OR offshore OR coastal) AND (governance OR policy) AND (transition OR change)	
Orkney (section 4)	(marine OR maritime OR offshore OR coast* OR harbour) AND (whaling OR fish* OR oil OR renewable* OR "energy transition" OR transition*) AND (Orkney OR Stromness OR Kirkwall OR Flotta OR "Scapa Flow")	(Social OR economic) AND (impacts OR change) AND (marine OR offshore OR maritime OR coast* OR harbour) AND (Orkney OR Stromness OR Kirkwall OR Flotta OR "Scapa Flow")	Oil AND Orkney AND Fund
North East Scotland (section 5)	(marine OR maritime OR offshore OR coast*) AND (Aberdeen* OR "North$East Scotland" OR Peterhead OR Fraserburgh OR "NE Scotland") AND (whaling OR fish* OR oil OR renewable* OR "energy transition" OR transition*)	(Social OR economic) AND (impacts OR change) AND (marine OR offshore OR maritime OR coast*) AND (Aberdeen* OR "North$East Scotland" OR "NE Scotland")	
Humber (section 6)	(marine OR maritime OR offshore OR coast* OR harbour) AND (whaling OR fish* OR oil OR renewable* OR "energy transition" OR transition*) AND (Humber* OR "Kingston upon Hull" OR Grimsby OR "Humber Estuary")	Social OR economic) AND (impacts OR change) AND (marine OR offshore OR maritime OR coast* OR harbour) AND (Humber* OR Kingston-upon-Hull OR Grimsby OR "Humber Estuary")	

Table 2. Rapid Evidence Assessment extraction questions.

Marine energy and just transitions

- What are the challenges of just transitions in coastal communities?
- How is the just transition framed in the context of METs?

Case study regions (Orkney, North East Scotland, Humber Estuary)

- Historically, what have been the most important maritime industries in the case study region?
- What were the key periods for these maritime industries?
- What transformed and changed these maritime industries over time?
- How were these changes governed in the context of the case study region?
- What were the socio-economic impacts of these changes in maritime industries?
- What are the current challenges for coastal communities living around the case study region?
- Are there any relevant just transition initiatives / policies of relevance?

To balance comprehensiveness with efficiency, databases returning over 100 results were filtered by relevance, with the top 100 results included for review. Subsequent results were reviewed in batches of ten until no relevant titles appeared. All search results were logged in a central database using Microsoft Excel.

Screening was carried out in two phases. First, titles (or descriptions) were assessed and scored as clearly not relevant (1), uncertain (2), or clearly relevant (3). A subset of records was screened by two researchers for consistency.

In the second phase, abstracts or extended descriptions were reviewed using the same criteria and moderated for consistency. The final evidence list comprised 181 sources (MET&JT = 61; North East Scotland = 47; Orkney = 52; Humber Estuary = 21) with some sources appearing across multiple topics. A description of the included materials is included in each section.

Most sources were accessed through online databases, but targeted consultation of archival and library collections was undertaken where materials were only available as physical holdings, including at Orkney Library and Archive, the National Library of Scotland, Aberdeen City Library and the University of Aberdeen Special Collections Centre.

Evidence was extracted by four researchers using a structured template aligned with the research questions detailed in Table 2. This process highlighted patterns and knowledge gaps, which informed the results summary and the analysis presented in subsequent chapters. Where needed for completeness and for contextual or background information, we have used additional research to provide evidence – the sources that have not appeared in the REA results are appropriately identified in the footnotes.

Owing to the variety of materials identified during the REA process and included in this report, to allow for a more critical reading, sources have been colour-tagged in the footnotes.

To this end:

- **Academic sources** will appear in green;
- **Governmental/ local authority sources** will appear in orange;
- **Personal accounts/books/periodicals** will appear in purple;
- **Industry-related sources** will appear in blue;
- **Third sector/international organisation sources** will appear in red.

2.1. Limitations of the Rapid Evidence Assessment methodology

As with all REAs, the findings presented in this report are shaped by the scope and nature of the available evidence, as well as by the constraints of the REA methodology. Although this approach enables a structured, transparent, and time-efficient synthesis, several limitations should be acknowledged.

Database-driven searches tended to privilege academic sources, which are more readily indexed and discoverable through online platforms, while community-level experiences and historical accounts are more likely to appear in grey literature, self-published works, or archival holdings. As a result, the evidence base included in this report contains a mix of peer-reviewed and non-peer-reviewed materials.

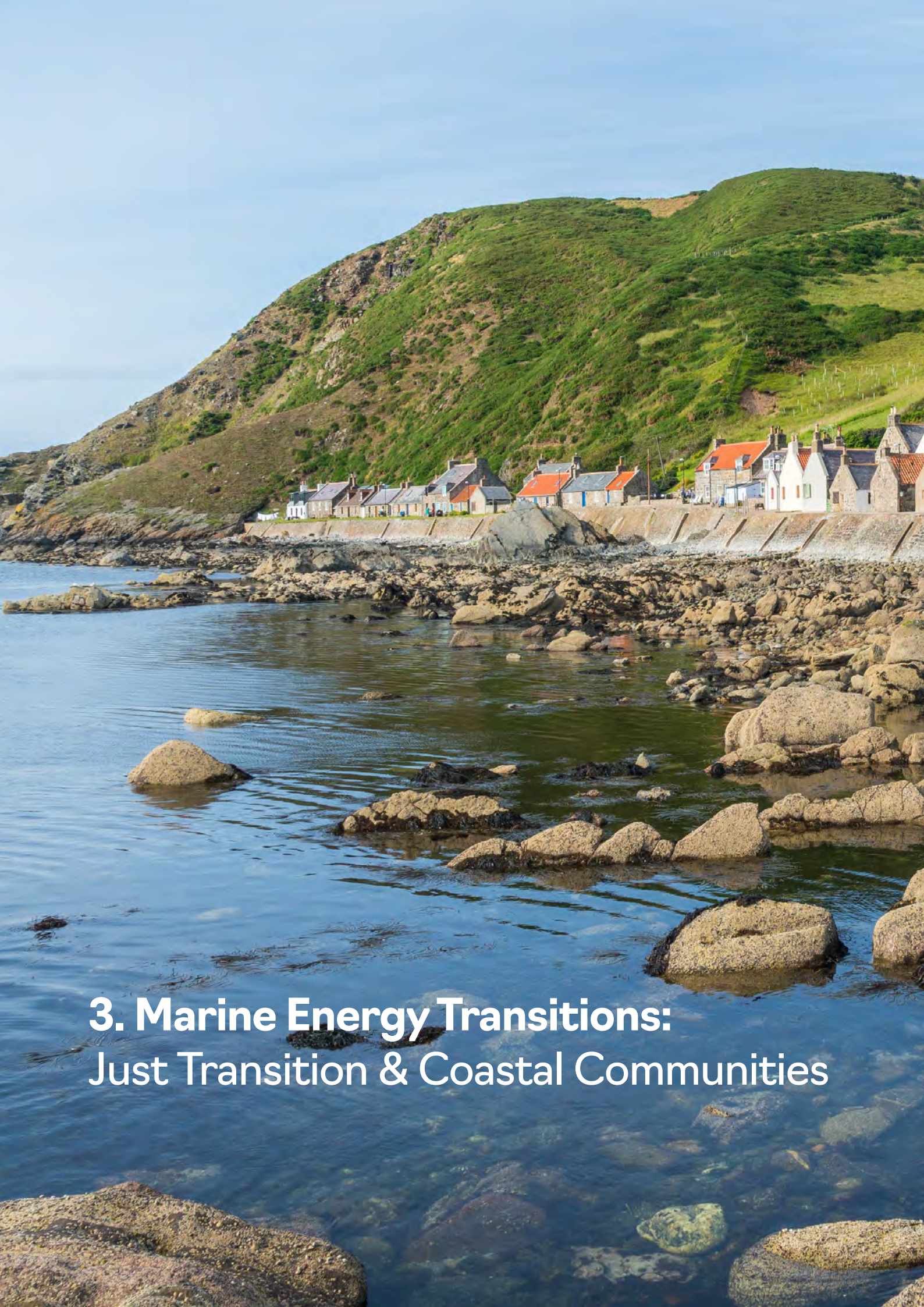
While such diversity reflects the multifaceted nature of METs and the importance of lived experience and local histories, it also means that the rigour, reliability, and methodological quality of the included sources vary considerably. Academic sources also tend to adopt more analytical or critical perspectives on past transitions, which influences how this evidence is interpreted across themes.

Evidence availability varied across the three case study areas, with substantially fewer sources identified for the Humber region. This pattern is broadly consistent with overall disparities in the number of published works on these regions, but it also reflects the limitations of a database-focused review. A full archival search (which is beyond the scope of a REA) may have revealed additional historical material.

The database-focused approach also biases the available evidence, favouring digitised materials and more recent publications. More recent works are more likely to be indexed in academic databases, while earlier sources may be inaccessible or only available in physical form. Consequently, the review may underrepresent older, non-digitised historical sources even where they are significant to local or sectoral histories.

A further limitation is that some well-known or locally significant texts may not have appeared in the search results. This reflects the nature of the REA approach, where the agreed search strings determine which materials are captured. Although these strings were developed and approved by the REA steering group to ensure consistency and transparency, the REA is not intended to be a full systematic review and cannot guarantee exhaustive coverage. As a result, certain key works may be missed, particularly where terminology, metadata, or indexing practices differ from the search parameters.

Lastly, the policy landscape for METs is evolving rapidly in the UK context, with several significant government strategies and consultations released during the process of this review. The REA should therefore be understood as a structured synthesis of evidence available at the time of analysis, providing a robust baseline for past transitions.



3. Marine Energy Transitions:
Just Transition & Coastal Communities

3. Marine Energy Transitions: Just Transition & Coastal Communities

The aim of this chapter is to explore the challenges of just transition as it relates to coastal communities, and to examine how the concept of just transition is framed in the context of METs and the wider blue economy. Using REA (see section 2 for detailed methodology), we survey the current literature and evidence to identify the conceptual and practical understanding of just transition in coastal communities. Following this, the report will focus on the three TRANSECTS case studies: Orkney, North East Scotland, and the Humber Estuary.

3.1. Background

Societies have long relied on the sea as a source of energy, natural resources, transport and trade, with marine environments providing vital forms of natural capital and infrastructure that have enabled industrial development and economic growth.[17] Over time, the ways in which natural capital has been extracted from the sea, and the technologies, infrastructures and labour systems that support it, have shifted in response to changing environmental, economic and political conditions. In the UK, this shift took coastal communities from the whale oil trade of the 18th and 19th centuries, through the rise of offshore oil and gas in the 20th century, to the present-day transition toward marine renewable energy. These transitions, while distinct in their contexts, share common underlying factors that have shaped the evolution of marine energy systems.

Successive transitions in marine energy systems have been driven, at least in part, by parallel structural pressures including the depletion of finite natural resources and changing social structures and perceptions including increasing environmental concerns. The decline of the whaling industry was catalysed by the overexploitation of whale populations highlighted by scientific evidence of severe stock declines[18] and mounting ethical opposition, particularly following the International Whaling Commission's (IWC) decision to impose a moratorium on commercial whaling in 1986.[19]

Similarly, the current move away from oil and gas production is propelled by declining reserves on the UKCS, which peaked in 1999, alongside international climate commitments such as the Paris Agreement, and the UK's legally binding net-zero emissions target by 2050.[20] As global climate priorities accelerate the production of renewable energy, coastal regions and communities that have been historically shaped by extractive marine economies, including whaling and fossil fuels, are increasingly positioned to lead the transition to sustainable marine energy production.[21]

Coastal regions and communities have played, and will continue to play, a pivotal role in supporting energy economies.[22]

[17] Michael H Depledge, 'Re-Thinking Human Interactions with the Oceans' (2024) 11 Royal Society Open Science 240808 https://doi.org/10.1098/rsos.240808 [added source].

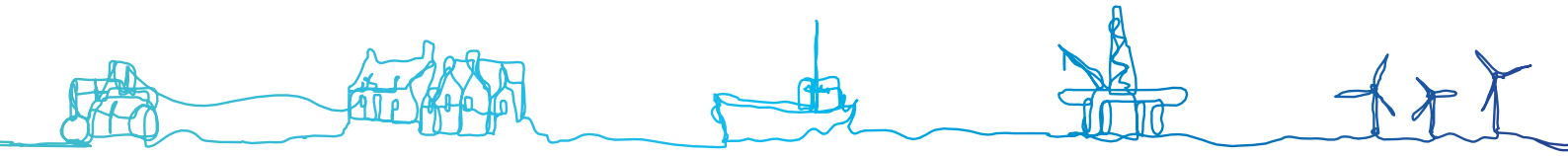
[18] Sidney G Brown, 'Modern Whaling in Britain and the North-East Atlantic Ocean' (1976) 6 Mammal Review 25 https://doi.org/10.1111/j.1365-2907.1976.tb00198.x [added source]; Noel Simon, 'Of Whales and Whaling' (1965) 149 Science 943 https://doi.org/10.1126/science.149.3687.943 [added source].

[19] Nick Gales, 'At 75 Years Old, the IWC Has Never Been More Globally Relevant' (2022) 141 Marine Policy 105089 https://doi.org/10.1016/j.marpol.2022.105089 [added source].

[20] Climate Change (2008) Act.

[21] Seung-Won Kang and Moon-Suk Lee, 'How Just Is the Low-Carbon Transition in Coastal Areas? Development of a Composite Vulnerability Index for Coastal Low-Carbon Transition' (2024) 158 Ecological Indicators 111401 https://doi.org/10.1016/j.ecolind.2023.111401.

[22] Deborah Greaves and others, 'UK Perspective Research Landscape for Offshore Renewable Energy and Its Role in Delivering Net Zero' (2022) 4 Progress in Energy 042012 https://doi.org/10.1088/2516-1083/ac8c19.



Their historical interconnection with marine industries, such as whaling and oil and gas operations, but also fishing, shipping, and shipbuilding, as examples, has produced distinctive local economic structures and social identities.[23] As pressures to decarbonise intensify, and national energy strategies increasingly position coastal regions and offshore zones as pivotal areas of green, sustainable, low-carbon industrial innovation, these areas face renewed and complex trade-offs between economic renewal, environmental sustainability and social justice. These issues raise complex questions about the relationships between place, power and justice, particularly who bears the burdens and **who benefits from METs, and they are central to how just transition is understood and experienced in coastal communities**.

While there is no accepted definition of 'coastal communities', they are commonly understood in the literature as the local populations living in areas close to the coast.[24] There are rarely clear boundaries or agreed cut-off points of where is included, although often coastal communities in the policy process are conflated with rural and island communities, leaving the urban populations out.[25] Historically, coastal communities of place have been characterised by close connections to marine industries, including fishing, shipping, and maritime trade.[26]

In the context of METs, however, the idea of a coastal community also extends to communities of interest, including groups and businesses whose activities or concerns relate to coastal and marine environments, and to communities of practice, such as offshore workers, engaged in marine sectors.

At the same time, many offshore industry actors, particularly in energy, operate with limited social, economic, or cultural ties with the coastal places around which they operate, raising important questions about representation, voice and the distribution of benefits and burdens in transition planning.[27]

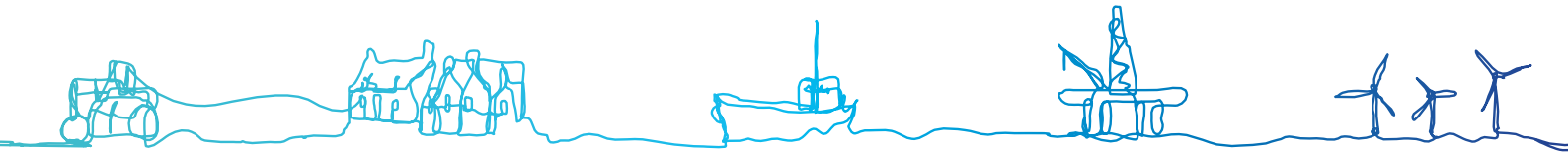
[23] Gillian B Ainsworth and others, 'A Fulfilled Human Life: Eliciting Sense of Place and Cultural Identity in Two UK Marine Environments through the Community Voice Method' (2019) 39 Ecosystem Services 100992 https://doi.org/10.1016/j.ecoser.2019.100992; PM Buchan and others, 'A Transdisciplinary Co-Conceptualisation of Marine Identity' (2024) 6 People and Nature 2300 https://doi.org/10.1002/pan3.10715; Tamara Antonia Krawchenko and Megan Gordon, 'Just Transitions for Oil and Gas Regions and the Role of Regional Development Policies' (2022) 15 Energies 4834 https://doi.org/10.3390/en15134834; Emily Stebbings and others, 'The Marine Economy of the United Kingdom' (2020) 116 Marine Policy 103905 https://doi.org/10.1016/j.marpol.2020.103905.

[24] Sheena Asthana and Alex Gibson, 'Averting a Public Health Crisis in England's Coastal Communities: A Call for Public Health Research and Policy' (2022) 44 Journal of Public Health 642 https://doi.org/10.1093/pubmed/fdab130; Social Research, 'Literature Review on a Marine Just Transition: UK and International Comparator Countries' (Scottish Government 2025) <https://www.gov.scot/publications/literature-review-marine-transition-uk-international-comparator-countries/> [added source].

[25] Stefania Fiorentino, Franziska Sielker and John Tomaney, 'Coastal Towns as "Left-behind Places": Economy, Environment and Planning' (2024) 17 Cambridge Journal of Regions, Economy and Society 103 https://doi.org/10.1093/cjres/rsad045; Lorna Philip, Ruth Wilson and Paula Duffy, 'Rurality, Islandness and Public Policy in Scotland' (2024) 140 Scottish Geographical Journal 113 https://doi.org/10.1080/14702541.2024.2315994 [added source].

[26] Social Research (n 24).

[27] ibid 41–43.



3.2. Results overview

Following first- and second-phase screening, 77 records were included in the database for evidence extraction. A further 16 were excluded during detailed review based on relevance and access. The final MET and just transition database comprised 61 sources.

The included materials were published between 1969 and 2025. Five sources were published before 1980, capturing early historical accounts of fisheries, coastal governance and the emergence of offshore oil and gas predominantly in the North Sea. Four were published between 1980 and 2000, reflecting a period shaped by the expansion of offshore oil and gas activity, growing socio-economic pressures on coastal communities, and academic engagement with marine policy reform. The majority of materials (*n* = 52) were published from 2000 onwards, corresponding with the contraction of North Sea oil and gas, the emergence of marine renewables, as well as increased academic, policy and industry attention to marine planning and net-zero transitions, however, these materials also include historical analyses.

The geographical focus of the included materials was strongly centred on the UK (*n* = 26), with most of these studies focusing specifically on Scotland (*n* = 20). Beyond the UK, sources examined global or international cases (*n* = 16), while eight focused on European contexts. A further four sources explored METs in the USA. The remaining sources were country specific case studies.

Most of the included materials were academic publications, including peer-reviewed journal articles, book chapters and conference papers (*n* = 51). Six sources were personal accounts or books, offering narrative, historical and lived-experience perspectives. Two sources were produced by third-sector or international organisations, and two by government bodies or local authorities.

3.3. What is a just transition?

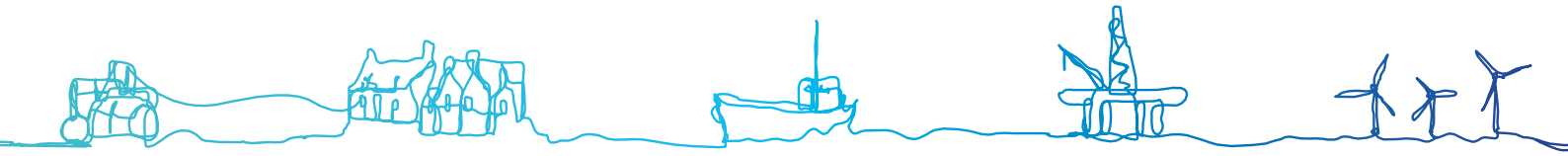
To contextualise the findings presented later in this chapter, this section outlines key framings of the broader just transition literature, drawing on wider sources than the materials identified during the REA process.

Just transition refers to the fair distribution of burdens and benefits arising from the shift to a low-carbon economy. The precise definition and scope of just transition vary depending on context.[28] Often a narrower definition is used with a focus on workers owing to the term's origins in US trade unions in the 1980s, where just transition was used to advocate for retraining, compensation and support for those affected by environmental regulation. This earlier, worker-oriented interpretation positioned energy transitions and economic transitions as intrinsically linked.[29] Over time, a broader understanding has emerged which brings together all elements of society in transition incorporating more traditional measures focused on jobs, skills, and earnings, but now also considers indicators focused on equality, wellbeing, participatory processes, and community empowerment.[30]

[28] Matthew S Henry, Morgan D Bazilian and Chris Markuson, 'Just Transitions: Histories and Futures in a Post-COVID World' (2020) 68 Energy Research & Social Science 101668 https://doi.org/10.1016/j.erss.2020.101668 [added source].

[29] Wang and Lo (n 11); Sanya Carley and David M Konisky, 'The Justice and Equity Implications of the Clean Energy Transition' (2020) 5 Nature Energy 569 https://doi.org/10.1038/s41560-020-0641-6; Dimitris Stevis and Romain Felli, 'Planetary Just Transition? How Inclusive and How Just?' (2020) 6 Earth System Governance 100065 https://doi.org/10.1016/j.esg.2020.100065.

[30] Daria Shapovalova and others, 'A Place-Based Approach to Measuring a Just Transition: Evidence from the North-East of Scotland' (2025) 127 Energy Research & Social Science 104236 https://doi.org/10.1016/j.erss.2025.104236 [added source].



Building on this widening scope, recent approaches to just transition are often interpreted through key tenets of justice: distributive, procedural, recognition, and restorative.[31] Together, these provide a means of evaluating fairness in both outcomes and processes of transitions. Distributive justice concerns how the social, economic and environmental costs and benefits of transition are shared across groups and regions. Procedural justice emphasises the inclusiveness, transparency, and accountability of decision-making processes that shape transition pathways. Recognitional justice focuses on acknowledging and respecting diverse identities, values and knowledges, particularly those historically marginalised or excluded from transition governance. Restorative justice extends this by addressing historical injustices and the legacies of extractive or exclusionary practices, seeking to repair harm and rebuild trust as part of the transition process.[32]

Given this expanded understanding, it becomes particularly important to consider how transitions are experienced and interpreted in different places. Coastal communities have played a central role in historical, contemporary and emerging METs, and they face distinctive challenges shaped by long-standing dependence on extractive industries and their pivotal position within the UK's energy economy. As such, examining just transition through coastal communities' specific experiences is particularly important. It is therefore essential to consider not only the challenges coastal communities face in navigating METs, but also how the idea of a "just transition" itself is framed and understood within these contexts.

3.4. Just transition in coastal communities

Just transition in coastal communities, particularly in the context of METs, is a multidimensional concept that extends beyond economic and technological considerations to include social, cultural, and institutional fairness. Its distinct meaning is often informed by the coastal communities' proximity to marine industrial developments combined with often-centralised governance arrangements for these developments and the uneven distribution of benefits and burdens.

A just transition requires addressing past injustices, embedding equity in governance and benefit-sharing, valuing cultural heritage, and creating conditions for community empowerment. It is through this framing that just transition requires the interlinked dimensions of restorative and distributional justice, reflecting the intertwined nature of injustices in coastal communities across successive energy transitions.

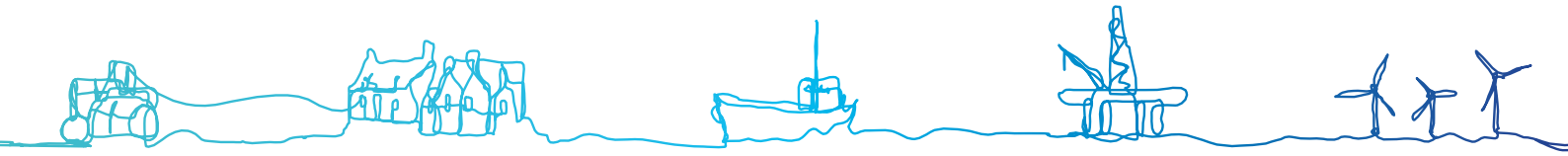
In the earlier marine energy industries, such as oil and gas, restorative or distributive justice issues were not central to the agenda. There have been ad hoc efforts to compensate some affected groups, but these were neither consistent nor widespread. For example, the fishing sector secured an industry-managed fund in 1975 to compensate for gear damage caused by oil-related debris.[33] Similarly, Shetland Islands Council negotiated 'disturbance payments' and revenue-sharing schemes that channelled profits from oil development into charitable trusts, used to "relieve social hardships, support local industries, and act as a cushion against the time when oil companies eventually moved out".[34]

[31] Rachel Bray and Rebecca Ford, 'Energy Justice POINTs : Policies to Create a More Sustainable & Fairer Future for All' (University of Strathclyde 2021) https://doi.org/10.17868/76421 [added source].

[32] Abram and others (n 11).

[33] RA McColl, 'Consequences for the Fishing Industry of Oil Industry Debris' (1980) 4 Marine Policy 61 https://doi.org/10.1016/0308-597x(80)90025-1.

[34] A Alvarez, *Offshore: A North Sea Journey* (Hodder and Stoughton 1986).



Although these measures offered compensation, they were grounded in the assumption that harm from extractive industries and energy transitions was inevitable. Contemporary justice framings in METs, however, emphasise preventing harm and ensuring fair benefit-sharing at the outset.

Distributional justice remains central, but is complicated by the shared nature of marine spaces.[35] While social and environmental burdens of METs tend to remain local, such as pressures on infrastructure and services (see section 3.5.4), workforce disruption (section 3.5.1) and the erosion of cultural identity (section 3.5.2); the benefits often outflow to the national scale and to external, distant investors.[36] As a result, just transition in marine energy is increasingly framed around equity and the fair distribution of benefits.[37] Researchers emphasise that those living closest to marine developments should benefit directly from the sea's use, rather than seeing the benefits accruing to distant investors.[38]

Shared or community ownership is presented as one way to embed distributive justice through, for example, shared equity schemes and community benefit funds for retaining value locally and supporting longer-term benefit sharing.[39] Local empowerment and participation in ownership are framed as mechanisms that can promote more equitable outcomes and create trust between developers and communities. However, unlike historical compensatory arrangements, for renewable energy projects where the emphasis is on benefit sharing and empowerment, these are typically more ad hoc, negotiated on a case-by-case basis, and largely dependent on developer discretion rather than statutory requirements.[40]

Procedural and institutional justice are central to just transition in METs, focusing on who participates in decision-making and how power is shared across governance levels. In marine and coastal settings, this takes on particular importance given the centralised and multi-sectoral governance arrangements creating complex decision-making processes (section 3.6.1). This makes participation and devolved governance particularly important for giving coastal communities meaningful influence over marine energy development. For just transition this requires human-centred, participatory, and collaborative coastal governance instead of top-down models prioritising 'expert' knowledge over lived experience.[41]

[35] (see section 3.6.1 on access rights and governance for examples).

[36] Johnson, Kerr and Side (n 8).

[37] John Michael Bainbridge, 'Investigation into a Future Policy Landscape to Achieve Sustainability in the Scottish Coastal Region' (Thesis PhD - University of Aberdeen 2014); Suzannah-Lynn Billing, 'The Role of Agents for Change in the Sustainable Development of Wave Energy in the Highlands and Islands Region of Scotland' (Thesis (PhD)-University of Aberdeen 2016); Geoffrey Wood and Keith Baker (eds), *A Critical Review of Scottish Renewable and Low Carbon Energy Policy* (Springer International Publishing 2017).

[38] Johnson, Kerr and Side (n 8); Robert C Brears, Developing the Blue Economy (Springer 2021); Billing (n 37).

[39] Sandy Kerr and others, 'Establishing an Agenda for Social Studies Research in Marine Renewable Energy' (2014) 67 Energy Policy 694 https://doi.org/10.1016/j.enpol.2013.11.063.

[40] ibid.

[41] Debadayita Raha and others, 'We Need Collaboration and Co-Creation to Address Challenges Facing Coastal Communities' (2024) 8 Nature Human Behaviour 814 https://doi.org/10.1038/s41562-024-01875-y; Carmen E Elrick-Barr, Timothy F Smith and Dana C Thomsen, 'Is "Hope" Helpful or a Hinderance? Implications for Coastal Governance' (2024) 248 Ocean & Coastal Management 106953 https://doi.org/10.1016/j.ocecoaman.2023.106953.

Lange and Cummins similarly advocate inclusive marine strategic planning that involves communities, developers, and policymakers.[42]

This focus on participation is reflected in community-based governance reforms that strengthen local agency within institutional structures. Barker highlights capacity building and co-management models,[43] while Ackerman et al. show how community-led governance and civic participation can build resilience and strengthen local partnerships.[44] Similarly, Armitage et al. emphasise the importance of multi-level governance networks, describing "bridging organisations" that connect actors vertically and horizontally across scales, linking local communities, industry and government.[45]

Co-production of knowledge and evidence in policy-making are also presented as a practical tool to support justice in METs by enabling mutual learning between communities, policymakers and researchers.[46] Koundouri, for example, emphasises participatory planning and co-design with local stakeholders as ways of aligning marine energy developments with community priorities and expectations.[47]

Conversely, centralised governance with limited community influence, is often framed as a form of procedural injustice in METs.[48] In this context, offshore renewable energy developments risk replicating extractive patterns that privilege external investors over local people.[49] A just transition therefore requires approaches that are attuned to coastal communities' needs and strengthen rather than erode community identity and wellbeing,[50] ensuring that change is done *with* communities, rather than *to* them.

[42] Marcus Lange and Valerie Cummins, 'Managing Stakeholder Perception and Engagement for Marine Energy Transitions in a Decarbonising World' (2021) 152 Renewable and Sustainable Energy Reviews 111740 https://doi.org/10.1016/j.rser.2021.111740.

[43] Adam Barker, 'Capacity Building for Sustainability: Towards Community Development in Coastal Scotland' (2005) 75 Journal of Environmental Management 11 https://doi.org/10.1016/j.jenvman.2004.11.002.

[44] Richard Ackerman and others, 'Coastal Community Resilience: A Comparative Case Study in Oregon, USA' (2025) 53 Coastal Management 220 https://doi.org/10.1080/08920753.2025.2477853. See also David A Gill and others, 'Triple Exposure: Reducing Negative Impacts of Climate Change, Blue Growth, and Conservation on Coastal Communities' (2023) 6 One Earth 118 https://doi.org/10.1016/j.oneear.2023.01.010.

[45] Derek Armitage, Anthony Charles and Fikret Berkes (eds), *Governing the Coastal Commons: Communities, Resilience and Transformation* (1st ed, Routledge 2017).

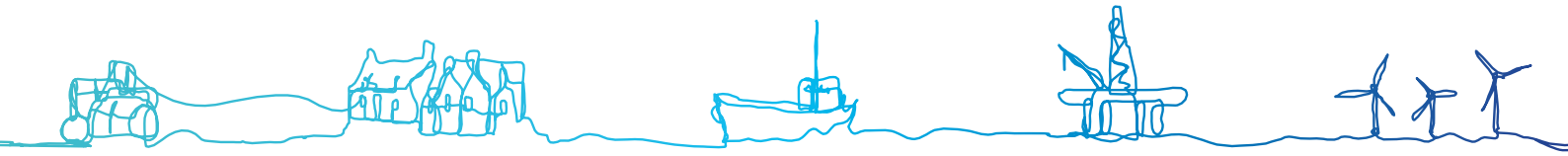
[46] Mariah D Caballero, Thushara Gunda and Yolanda J McDonald, 'Energy Justice & Coastal Communities: The Case for Meaningful Marine Renewable Energy Development' (2023) 184 Renewable and Sustainable Energy Reviews 113491 https://doi.org/10.1016/j.rser.2023.113491; Shona K Paterson and Ilan Chabay, 'Navigating the Currents of Coastal Narratives in Search of Sustainable Futures' (2024) 29 Mitigation and Adaptation Strategies for Global Change 46 https://doi.org/10.1007/s11027-024-10142-4.

[47] Phoebe Koundouri, *The Ocean of Tomorrow: The Transition to Sustainability*, vol 2 (Springer 2021).

[48] Shapovalova and others (n 5).

[49] Johnson, Kerr and Side (n 8).

[50] Selina M Stead, 'Changes in Scottish Coastal Fishing Communities—Understanding Socio-Economic Dynamics to Aid Management, Planning and Policy' (2005) 48 Ocean & Coastal Management 670 https://doi.org/10.1016/j.ocecoaman.2005.08.001.



Research demonstrated that vulnerability to low-carbon transitions varies significantly across regions and sectors, highlighting the need for tailored planning and policy interventions that address these disparities and support those most at risk. [51]

Axon and Collier highlight the disproportionate vulnerabilities of marginalised coastal communities and communities of colour, noting that large-scale blue economy developments risk replicating existing inequalities unless justice principles are incorporated at the outset. [52] Similarly, Kang and Lee argue that supporting vulnerable coastal regions during low-carbon transitions is essential to address inter-regional inequality. [53] Koundouri links inclusive development and cultural ecosystem service valuation to participatory co-design, ensuring that new marine developments leave "no one behind". [54]

Within METs, just transition also addresses recognitional and cultural justice. Fairness is understood not only in economic terms but in how well transitions respect coastal identities, local histories, and place attachments.

Studies show that maritime heritage, ways of life and a sense of belonging shape perceptions of transitions as just, [55] and that loss of identity (e.g., fishing or seafaring culture) are seen as injustices in their own right. [56] Recognition justice centres on cultural continuity, local identity, and community agency with place attachment and shared identity serving as strong community organisation motivation. [57] Regeneration efforts often fail when they overlook the social infrastructure and cultural networks that sustain place-based resilience. [58] From these perspectives, just transition in coastal settings is understood as fair only when it aligns with the cultural fabric and heritage of the communities affected.

Justice in METs is defined by the lived experiences of coastal communities. Place-based identities and cultural meanings shape what communities see as a fair transition. [59] Thus, rather than relying on abstract blue-economy narratives of just transition, this understanding should emerge from within communities themselves, reflecting the values, memories and lived realities of coastal life. [60] Recognition in this sense is both social and epistemic, rooted in the inclusion of lived experience and cultural knowledge as legitimate sources of understanding within marine energy governance.

[51] Kang and Lee (n 21).

[52] Stephen Axon and Sammy Collier, 'Breaking Blue: Establishing Comprehensive Policy for a Just and Inclusive Transition for the Blue Economy' (2023) 147 Marine Policy 105343 https://doi.org/10.1016/j.marpol.2022.105343.

[53] Kang and Lee (n 21).

[54] Koundouri (n 47).

[55] Ackerman and others (n 44); Paterson and Chabay (n 46).

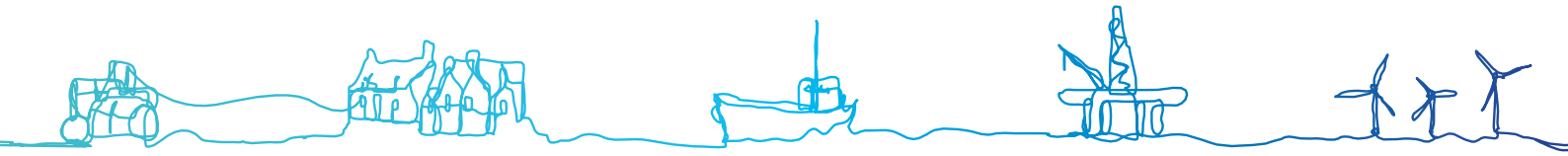
[56] Armitage, Charles and Berkes (n 45); Kathleen Schwerdtner Máñez and Bo Poulsen, *Perspectives on Oceans Past* (Springer 2016).

[57] Armitage, Charles and Berkes (n 45).

[58] *Sea Change (2007-2013): Part II, Marine Foresight Exercise for Ireland* (Marine Institute 2006).

[59] Paterson and Chabay (n 46).

[60] John Morrissey, 'Coastal Communities, Blue Economy and the Climate Crisis: Framing Just Disruptions' (2023) 189 The Geographical Journal 283 https://doi.org/10.1111/geoj.12419; D Raha and others (n 41).



One important aspect of supporting recognition, distributive, procedural, and recognition justice in coastal communities (and elsewhere) is community capacity, autonomy, and resources. In a coastal socio-economic scoping study, empowerment, local partnerships and limited government intervention were identified as strategies for building self-supporting coastal communities, while also encouraging diversification into tourism, recreation and small-scale industry. [61] Stead and Bainbridge similarly highlight that investment in training and regional development/collaboration is critical to sustaining local wellbeing during transitions. [62]

Heyen et al. provide an example from Gothenburg of such transformative practice, describing how government and industry collaboration during the decline of shipbuilding enabled retraining, redeployment and early retirement, preventing mass unemployment and supporting a transition toward a coastal science economy. [63] Transforming the economic structures that underpin dependency and vulnerability is therefore central to just transition in METs, linking capacity building directly to long-term regeneration resilience and sustainable local development.

To conclude, a just transition in coastal communities requires more than economic change. It must address past harms, ensure fair distribution of benefits, democratise decision-making, and respect local identities and knowledge. Because coastal communities often bear burdens while benefits flow elsewhere, justice demands participatory governance, culturally grounded approaches, and locally retained value.

Building community capacity and autonomy is essential so that transitions strengthen, rather than erode, community wellbeing and long-term resilience. The next section summarises and details specific challenges of just transition in coastal communities as identified from the evidence.

3.5. Challenges of just transitions in coastal communities

Coastal communities have long derived their livelihoods from oceans and seas. Their proximity to marine resources has supported traditional maritime industries including fishing, whaling, shipping, shipbuilding, oil and gas, tourism, and today - renewables. While this dependence has created strong local identities and cultures, it has also created challenges in transition and facilitated structural dependencies on a narrow range of resource-driven industries often highly exposed to global markets, technological change and resource depletion.

This creates several barriers and challenges of delivering a just transition, which are grouped below around:

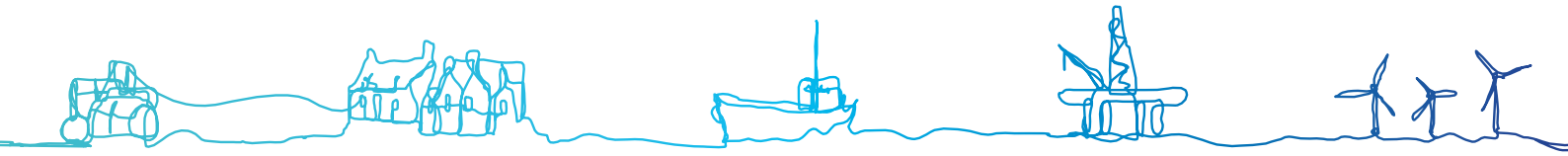
1. economic dependencies;
2. cultural challenges;
3. participation; and
4. local amenities and housing.

These are discussed in turn overleaf.

[61] Environment and Society University of Aberdeen School of Resources, *Scottish Coastal Socio-Economic Scoping Study* (Scottish Executive Social Research 2002).

[62] Stead (n 50); Bainbridge (n 37).

[63] Dirk Arne Heyen and others, 'Just Transition in the Context of EU Environmental Policy and the European Green Deal' (Öko Institut 2020).



3.5.1. Economic dependency, industrial decline, and workforce patterns

Coastal communities' vulnerability to change is often shaped by the **continued importance of highly variable and volatile traditional maritime industries**, posing a particular challenge for achieving just transitions in coastal regions.[64] When external drivers, such as environmental pressures, policy reform, or the arrival of new technologies and industrial actors transform these sectors, they often trigger the contraction or displacement of established traditional maritime activities,[65] including fishing[66] and shipbuilding.[67] When these sectors decline, communities lose their main source of secure employment and revenue, leading to economic instability,[68] and reductions in local tax revenues, public services funding, and investment.[69]

Instability has often been intensified by the arrival of new industries offering higher wages than local firms could match, drawing workers away and leaving traditional businesses unable to recruit or retain staff.[70] As **global competition and technological change** intensified,[71] many of the jobs created by the incoming industries were short-term, seasonal, low-skilled, and male-dominated,[72] doing little to rebuild inclusive or secure local economies. Traditional and local firms have been among the most adversely affected, struggling to adapt to rapid industrial transformation.[73] This deep-rooted reliance on traditional industries as cornerstones of local economies and societies has left many coastal communities economically precarious and constrained their ability to adapt to, and benefit fairly from, low-carbon transitions.

Many coastal economies remain **heavily dependent on one or two core maritime sectors**, a pattern that heightens fragility and limits adaptability during transitions.[74] Coull et al. trace the whaling industry's sequence of "rapid expansion… intense competition… ending in declining resources and industrial failure".[75] Such dependence magnifies the disruptive potential of low-carbon transitions, increasing the risk of unjust outcomes.

Where a single sector dominates, even modest market or policy changes can destabilise coastal livelihoods.[76] Experience from the North East of Scotland shows how rapid expansion of the oil sector created long-term vulnerability to industry volatility, with public institutions struggling to plan for rapid growth without long-term stability.[77] In such contexts, transitions risk reproducing the boom-and-bust cycles with local people bearing the costs while external actors capture disproportionate benefits.

[64] Shapovalova and others (n 5).

[65] Johnson, Kerr and Side (n 8).

[66] Ackerman and others (n 44); Stead (n 50); Barker (n 43).

[67] Heyen and others (n 63).

[68] Stead (n 50); Mathew Nicolson, '"These Groups of Islands Are Different": Identity and Constitutional Change in Orkney and Shetland, 1966-1990' (2023) 21 LISA https://doi.org/10.4000/lisa.15558.

[69] Ackerman and others (n 44).

[70] Jones and Godwin (n 8).

[71] John Moir, *The Impacts of Oil-Related Development on Aberdeen in the 1970s* (Duncan of Jordanstone College of Art 1983).

[72] Jones and Godwin (n 8).

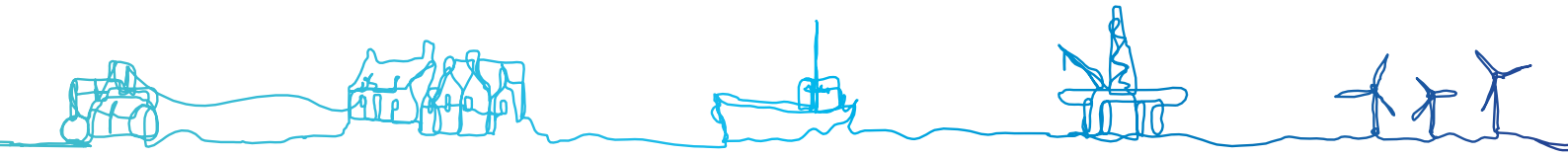
[73] Moir (n 71).

[74] Nicolson (n 68); Stead (n 50).

[75] James R Coull, Alexander Fenton and Kenneth Veith (eds), *Boats, Fishing and the Sea* (John Donald 2008).

[76] University of Aberdeen School of Resources (n 61).

[77] Moir (n 71); Shapovalova and others (n 5).



Transitions can **significantly disrupt local labour markets**, introducing short-term booms, skills mismatches, and uneven employment opportunities. New industries often generate an initial surge of construction and development work, but these jobs are temporary and rarely form the basis of long-term local stability.[78]

Labour market instability can also drive **in- and outmigration**, further eroding the social infrastructure that just transitions depend on. Declining opportunities in sectors such as fishing have been linked to low morale and outmigration,[79] as workers seek employment elsewhere rather than transition to other industries in the area. Those who leave are often among the most active community contributors and their departure undermines sustaining local networks and leadership.[80]

Over time, this can lead to population decline and the loss of younger generations when local labour markets no longer provide secure prospects,[81] as seen during oil downturns that triggered mass redundancies and eroded local economies.[82] Similar concerns are raised in the current discussion on the oil workforce transition into renewables – many workers report a preference for relocating to work in oil elsewhere rather than transition into a different industry locally.[83]

3.5.2. Culture, livelihoods, identity, and sense of place

For many coastal communities, maritime industries, such as fishing, have long provided not only employment but also the cultural and social structures that shape **collective identity** - "the forum through which community bonds, values, knowledge, language and traditions are established, confirmed and passed on".[84] Generations have built their livelihoods and sense of place around the sea, and changes in how marine spaces are used have consequences beyond economic impacts.

Such changes can erode **place attachment and destabilise cultural identities**, presenting a significant challenge for just transition in coastal communities. Shifts in economic and cultural priorities, such as the move away from traditional fishing towards new marine industries, have been linked to feelings of displacement and identity loss.[85] Armitage et al. show how drivers of change, such as youth outmigration, new institutions, and physical changes to coastal commons, can weaken people's connection to their community and alter their sense of place.[86] Similarly, Caballero et al. found that physical change to the coastal landscapes linked to marine renewables threatens communities' attachment to place and cultural identity.[87]

[78] Jones and Godwin (n 8).

[79] Stead (n 50).

[80] *Sea Change (2007-2013): Part II, Marine Foresight Exercise for Ireland* (n 58).

[81] Johnson, Kerr and Side (n 8).

[82] Bill Mackie, *The Klondykers: The Oilmen Onshore* (Birlinn 2006).

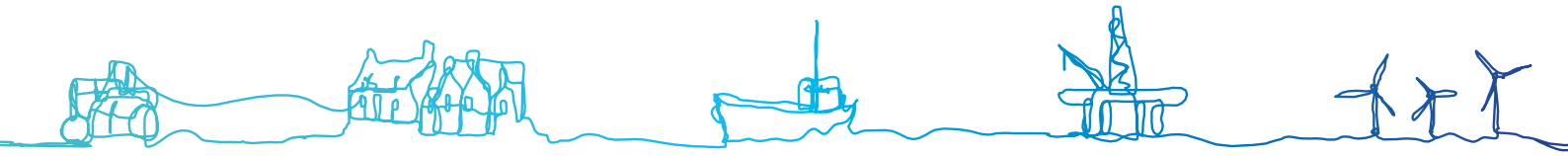
[83] Scottish Affairs Committee (n 3).

[84] Katherine Brookfield, Tim Gray and Jenny Hatchard, 'The Concept of Fisheries-Dependent Communities: A Comparative Analysis of Four UK Case Studies: Shetland, Peterhead, North Shields and Lowestoft' (2005) 72 Fisheries Research 55 https://doi.org/10.1016/j.fishres.2004.10.010

[85] Billing (n 37); Schwerdtner Máñez and Poulsen (n 56).

[86] Armitage, Charles and Berkes (n 45).

[87] Caballero, Gunda and McDonald (n 46).



This erosion of place identity is often linked to the loss of traditional ways of life [88] and the weakening of long-standing maritime communities and practices. [89] Deep-rooted traditions and cultures that once defined "the way of life", [90] risk becoming "obsolete" and "museum-like". [91]

These changes are especially disruptive in coastal communities where the **land and sea are experienced as inseparable**. [92] When transitions are experienced as externally driven or culturally disruptive, community support for the incoming industry may decline [93] and the transition is less likely to be perceived as fair or just.

Cultural changes also contribute to a wider **sense of marginalisation and loss of agency**. Local knowledge and experiential expertise are often undervalued in planning and policy processes. [94] Groups that once held stature and influence, such as fishermen, have seen their voice diminish as new marine industries expand. [95] This perceived loss of standing leaves communities feeling excluded in transitions that reshape their way of life, making it harder for change to be experienced as fair.

These dynamics shape how communities imagine their future. Visions for what coastal regions should become are often fragmented and contested. [96] Long-term residents, those tied to traditional maritime livelihoods and 'incomers' (e.g., incoming and transient workforce, retirees) may hold sharply different priorities and values. Some studies describe **conflicting visions for community futures**, [97] with acceptability of transition pathways varying by individual and group perceptions, resources, and capabilities. [98] Others note how 'incomers' may resist changes that challenge their own expectations of coastal life. [99] Such divergence makes it harder to build the shared long-term outlook that just transitions require.

In other cases, the **rapid in-migration of highly paid workers**, combined with the loss of younger locals, has disrupted traditional support networks and altered cultural norms. In Shetland, for example, oil wealth was associated with a perceived shift from neighbourly solidarity to more individualistic attitudes, where "people [became] inward looking and selfish, less caring about the interest of others". [100]

[88] University of Aberdeen School of Resources (n 61).

[89] David Butcher, *Living from the Sea: Memories of Shoreside Life in the Days When Fishermen's Nets Were Often Full, but Their Pockets Usually Empty* (Tops'l Books 1982).

[90] Brookfield, Gray and Hatchard (n 84).

[91] Butcher (n 89).

[92] Chris Foulds and Rosie Robison (eds), *Advancing Energy Policy: Lessons on the Integration of Social Sciences and Humanities* (Springer Nature 2018).

[93] Samandar Khan Afridi and others, 'Winds of Progress: An In-Depth Exploration of Offshore, Floating, and Onshore Wind Turbines as Cornerstones for Sustainable Energy Generation and Environmental Stewardship' (2024) 12 IEEE Access 66147 https://doi.org/10.1109/access.2024.3397243; Olivier Joalland and Pierre-Alexandre Mahieu, 'Developing Large-Scale Offshore Wind Power Programs: A Choice Experiment Analysis in France' (2023) 204 Ecological Economics 107683 https://doi.org/10.1016/j.ecolecon.2022.107683.

[94] Kerr and others, 'Establishing an Agenda for Social Studies Research in Marine Renewable Energy' (n 39).

[95] Billing (n 37).

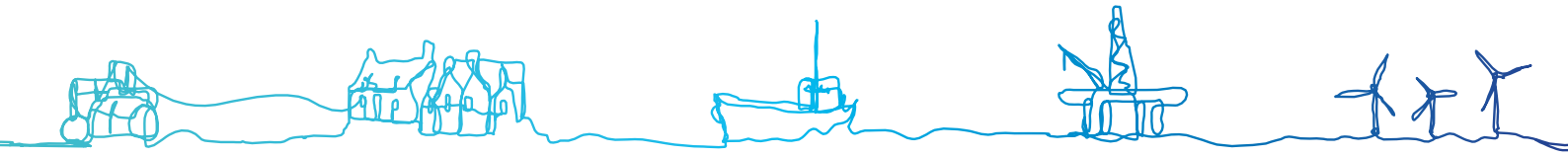
[96] Ackerman and others (n 44); Paterson and Chabay (n 46).

[97] Ackerman and others (n 44).

[98] Paterson and Chabay (n 46).

[99] Billing (n 37).

[100] Alvarez (n 34).



Tensions also emerged between locals and large temporary oil workforce in Aberdeenshire and Peterhead, with some locals resenting the transformation of their communities.[101]

These varying visions frequently manifest in **practical disputes over coasts and marine use**. Expanding sectors such as coastal tourism, aquaculture, and energy can generate tensions with existing livelihoods.[102] Traditional groups, particularly fishers, reported feeling displaced by marine energy projects that restrict access to fishing grounds or alter the economic balance of local industries,[103] with spatial conflicts highlighting the need for co-existence strategies.[104]

Deeply rooted environmental and place-based values can conflict with growth-oriented or externally driven economic goals.[105] Concerns about the loss of non-market values,[106] including cultural landscapes and ecosystem services, can further intensify opposition. Where new sectors grow without reconciling these conflicting visions, transitions risk deepening social division and resistance, undermining both the perceptions of fairness and the feasibility of a just transition.

3.5.3. Local participation and resourcing

A major challenge for achieving a just transition in coastal communities is the persistent **deficit of financial, institutional, and technical resources** needed to allow coastal communities to fully participate in, influence and adapt to marine change.[107] These deficits create structural barriers to fairness by limiting who can engage in decision-making and who can benefit from new industries. Many coastal regions enter transition processes with structurally weakened workforces, fragile local economies (section 3.5.1) and limited access to the data and expertise required for strategic planning.[108]

Local actors often lack the time, resources, and organisational support to engage with **complex planning and consultation processes**.[109] Small-scale fishers, for example, report being under-resourced and over-stretched, unable to attend meetings or navigate the technical and legal demands of offshore licensing;[110] women and informal actors are often excluded.[111] Long-standing socio-institutional barriers and declining civic infrastructure further weaken collective action, while mistrust between communities, developers, and policymakers complicates dialogue about future marine uses.[112]

[101] J Fernie, 'North Sea Oil: A Review' (1977) 62 Geography 56.

[102] Anthony Charles, 'People, Oceans and Scale: Governance, Livelihoods and Climate Change Adaptation in Marine Social–Ecological Systems' (2012) 4 Aquatic and Marine Systems 351 https://doi.org/10.1016/j.cosust.2012.05.011.

[103] Billing (n 37).

[104] Maximilian Felix Schupp and others, 'Fishing within Offshore Wind Farms in the North Sea: Stakeholder Perspectives for Multi-Use from Scotland and Germany' (2021) 279 Journal of Environmental Management 111762 https://doi.org/10.1016/j.jenvman.2020.111762.

[105] Kazimierczuk and others (n 7).

[106] Sandy Kerr and others (n 39).

[107] Elrick-Barr, Smith and Thomsen (n 41); Brears (n 38).

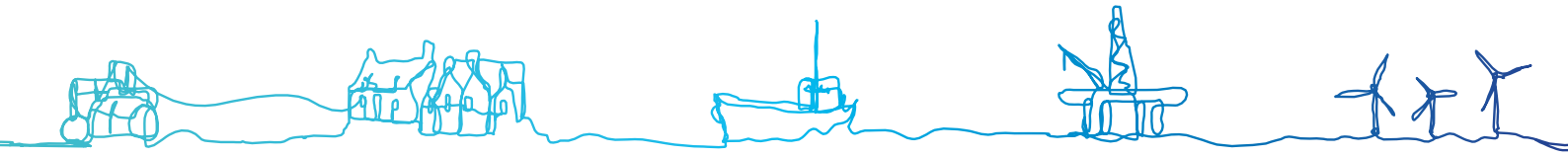
[108] Stead (n 50); Armitage, Charles and Berkes (n 45); Kazimierczuk and others (n 7).

[109] Elrick-Barr, Smith and Thomsen (n 41); Brears (n 38).

[110] Inne Withouck and others, 'Diving into a Just Transition: How Are Fisheries Considered during the Emergence of Renewable Energy Production in Scottish Waters?' (2023) 101 Energy Research & Social Science 103135 https://doi.org/10.1016/j.erss.2023.103135.

[111] Schwerdtner Máñez and Poulsen (n 56).

[112] Paterson and Chabay (n 46); Morrissey (n 60).



Even where participation mechanisms exist, they are often shallow or symbolic, offering marginalised groups l**ittle real influence over decisions** that will (re)shape their economies and cultural landscapes,[113] which undermines the procedural fairness central to a just transition and fuels scepticism when offshore renewables fail to deliver tangible local benefits.[114] This erodes procedural fairness essential to just transition and restricts communities' capacity to negotiate equitable outcomes as marine industries evolve.[115]

Funding insecurity and weak local infrastructure further constrain the ability of coastal communities to achieve just transition outcomes. Traditional industries that sustain many coastal communities frequently operate with limited financial reserves, making it difficult to invest in adaptation or diversification.[116] While national and international transition funds exist, e.g., through European Union Just Transition Mechanism,[117] they are usually designed for broader industrial change and rarely specifically address the circumstances of small, remote or economically precarious coastal communities. This material imbalance reinforces perceptions of externally-driven and industry-led development, with **few mechanisms to retain economic benefits or decision-making knowledge locally**.[118]

A **lack of accessible data and the undervaluing of local knowledge** often present additional challenges with communities often lacking access to baseline environmental and socio-economic information needed to contest or shape development proposals.[119] The **lack of integration of local knowledge** leaves regional disparities poorly captured in planning and allows transition policies to overlook the differentiated impacts on low-income or marginalised groups.[120] These gaps hinder evidence-based, place-sensitive transition planning and risk reproducing existing inequalities, rather than correcting them, which conflicts with the core principles of just transition.

External control and economic depletion further limit the resources available for just transition. The global nature of the energy industry means that marine renewable energy, for example, frequently relies on international supply chains, so local economies do not retain many of the associated benefits.[121]

3.5.4. Housing and public service pressure

As traditional industries contract from coastal areas, family-wage jobs decline and younger households move away, while many communities simultaneously experience an influx of retirees and an ageing resident base.[122] A key challenge for just transition in coastal communities therefore - in addition to the impact on social

[113] Billing (n 37).

[114] Jiska Reinarda de Groot, 'Attitudes towards Marine Energy: Understanding the Values' [2015] Other Faculty of Science and Engineering Theses.

[115] Axon and Collier (n 52); Withouck and others (n 110).

[116] Brears (n 38).

[117] European Commission, 'The EU Blue Economy Report 2022' (2022) <https://op.europa.eu/en/publication-detail/-/publication/156eecbd-d7eb-11ec-a95f-01aa75ed71a1> Accessed 8 October 2025

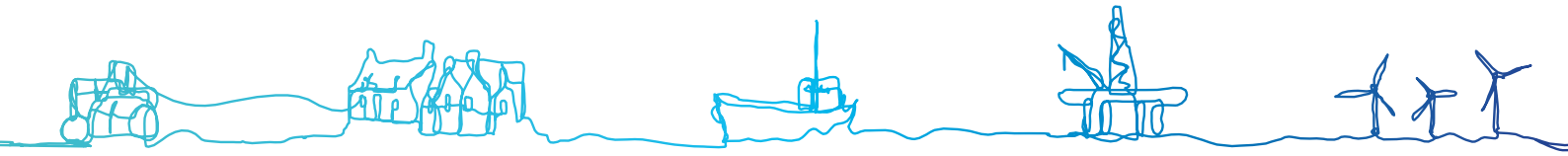
[118] Gill and others (n 44).

[119] Elrick-Barr, Smith and Thomsen (n 41).

[120] Axon and Collier (n 52).; Withouck and others (n 110).

[121] Kerr and others (n 39).

[122] Ackerman and others (n 44); Barker (n 43).



cohesion and community attachment (section 3.5.2) - is how this shifting population structure **reshapes housing markets and places additional pressure on local services**.

New extractive and energy industries have also brought waves of temporary, often better-paid workers.[123] During the North Sea oil boom, for example, incoming workers frequently remained socially and culturally distinct from long-term residents,[124] living separately and using different schools and shops.[125] Similar patterns arise when economically distinct newcomers - retirees, second-home buyers or external corporate workforces – not only deepen age and income stratification[126] but also[127] **drive up housing costs**, reduce availability for local residents, **and increase demand for already stretched local services**.

Marine transitions have often outpaced **the service and infrastructure capacity of coastal communities**. Areas already facing declining revenues and reduced public spending were then expected to absorb sudden in-migration linked to oil and gas boom, for example.[128] Local authorities struggled to expand schools, healthcare, roads and utilities quickly enough to meet new demand.[129] In Peterhead, for example, the rapid transformation of the port into a major oil service base, created acute pressure on housing and infrastructure.[130] While some regions, such as Shetland, benefited from reinvested revenues,[131] similar support was uneven across other coastal areas. **Fragmented planning systems and limited local fiscal autonomy** left councils poorly equipped to meet infrastructure demands. The overstretching and degradation of essential services is a challenge of just transition.

Housing pressures have been a particularly acute and visible challenge of just transition within coastal communities. Industrial booms brought large, often better-paid workforces into areas with limited housing stock. Oil firms' higher wages drew labour from existing sectors and inflated local housing costs.[132] In Aberdeen and Peterhead, temporary construction booms created housing shortages, forcing local industries to turn down contracts because they could not recruit or retain workers without affordable homes[133] and inflating property prices for local residents. In the longer term, coastal housing markets were further skewed by second-home ownership and the influx of retirees, reducing availability for younger families and working-age residents.[134]

This section examined the main challenges of METs in coastal communities, examining economic dependencies, cultural identity shifts, participation gaps, demographic and housing pressures. Identifying these challenges help inform the next section examining, in more detail, the governance and opportunities for coastal community transitions.

[123] Shetland Research and Development Department, *Shetland's Oil Era, Phase 2* (1978).

[124] Fernie (n 101).

[125] Alvarez (n 34).

[126] Ackerman and others (n 44); Schwerdtner Máñez and Poulsen (n 56); Gill and others (n 44).

[127] Ackerman and others (n 44).

[128] ibid; Barker (n 43).

[129] Hance D Smith, Alexander Hogg and A MacGregor Hutcheson, 'Scotland and Offshore Oil: The Developing Impact' (1976) 92 Scottish Geographical Magazine 75 https://doi.org/10.1080/00369227608736334.

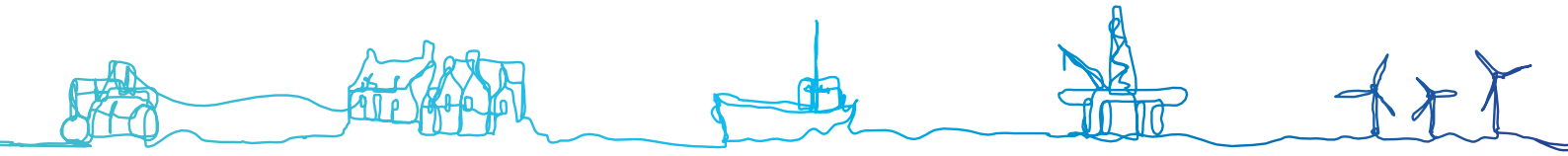
[130] Fernie (n 101).

[131] Johnson, Kerr and Side (n 8).

[132] Fernie (n 101).

[133] Jones and Godwin (n 8).

[134] Ackerman and others (n 44); University of Aberdeen School of Resources (n 61).



3.6. Governance and opportunities for just transition in coastal communities

Governance is a cross-cutting factor shaping the fairness and feasibility of just transitions in coastal and marine contexts. Historically and today, fragmented authority, short-termism, and policy disconnect have created significant barriers. Yet, governance can also provide the mechanisms to strengthen participation, accountability, and benefit sharing. This section therefore examines both the governance challenges that constrain just transitions and the opportunities for more coherent, inclusive, and place-based governance arrangements.

3.6.1. Challenges of governing 'just' marine energy transitions

A challenge for delivering a just transition in coastal communities often stems from **fragmented and poorly coordinated governance of marine and coastal spaces.**

Policy responsibilities are divided across multiple levels - local, regional, national and sometimes supranational - with overlapping mandates and limited integration mechanisms.[135] Differences between terrestrial, coastal and marine policies and planning regimes further complicate decision-making and impede efforts to balance emerging marine uses with existing coastal livelihoods and provide joined-up planning (e.g., Table 3).[136] Johnson et al., note the lack of planning controls and property rights in marine areas compared to terrestrial settings, despite marine developments having significant local impacts on adjacent coastal communities.[137]

Multi-level and transnational governance arrangements complicate achieving just transitions for coastal communities.[138]

Table 3. Government agencies and departments involved in various stages of offshore energy planning and consents.

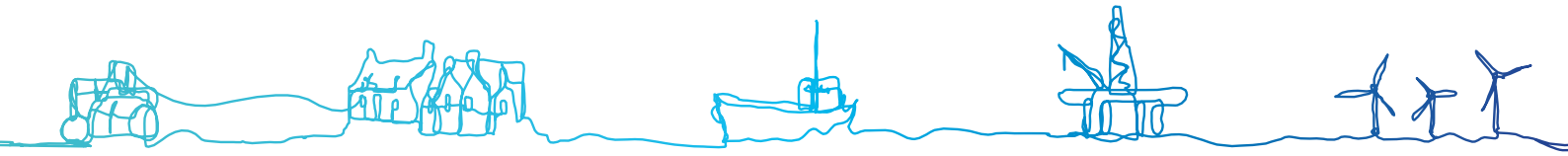
	Oil & Gas	Offshore Wind	
	UK	UK	Scotland
Leasing		Crown Estate	Crown Estate Scotland
Licensing	NSTA	MMO	Marine Scotland
Permits/consents	DESNZ	DESNZ/Planning Inspectorate	Scottish Ministers/ Marine Directorate
Environment	OPRED/DESNZ/JNCC	DESNZ/JNCC/ Natural England	Nature Scot/JNCC/ Marine Scotland
Decommissioning	NSTA/OPRED	DESNZ	Marine Directorate
Health & safety	HSE	HSE	HSE
Marine spatial planning	MMO	MMO	Marine Directorate

[135] Koundouri (n 47); Marina Cucuzza, Joshua S Stoll and Heather M Leslie, 'Comprehensive Plans as Tools for Enhancing Coastal Community Resilience' (2020) 63 Journal of Environmental Planning and Management 2022 https://doi.org/10.1080/09640568.2019.1700943.

[136] Koundouri (n 47).

[137] Johnson, Kerr and Side (n 8).

[138] Kristof Van Assche and others, 'Governance and the Coastal Condition: Towards New Modes of Observation, Adaptation and Integration' (2020) 112 Marine Policy 103413 https://doi.org/10.1016/j.marpol.2019.01.002.



Authority over marine and coastal change often lies between regional, Scottish, UK and European actors, creating **ambiguity around power, ownership, and access rights**.[139] This fragmented landscape, reinforced by a lack of national coordination, leaves local actors navigating a disjointed policy environment.[140] In some contexts, interactions among economic, environmental, and land-use factors further complicate policy targeting,[141] making it harder to create policies that respond to local transition needs and vulnerabilities.

This structural complexity also creates a **disconnect between high-level policy and local needs** and competencies.[142] National decarbonisation strategies are typically designed and delivered by central government and major industry actors, with few mechanisms to draw on local capacities. While Marine Spatial Planning (MSP) is intended as a tool to help bridge this gap, offshore governance often continues to sit firmly at the national scale, limiting the extent to which coastal community voices shape transition debates.[143]

This **lack of local control** is reinforced by policy approaches that overlook place-based realities. As noted above, while local knowledge is essential for shaping sustainable and socially just transition policies, weakened local governance rights reduce local communities' ability to influence decisions.[144] Many policies overlook regional disparities in how transition costs and benefits are distributed, while local economic needs and human rights are frequently sidelined,[145] reinforcing calls for transparency and inclusive representation in offshore wind governance.[146] **Technical and environmental priorities objectives tend to dominate** marine resource governance, further limiting the coastal communities' capacity to shape transition pathways on fair and inclusive terms.[147]

Planning frameworks intended to guide change in coastal and marine spaces are often poorly adapted to the complex realities of contemporary transitions. Prohibitive policy or inflexible assessment frameworks make it difficult for communities and local authorities to plan for a long-term and just change.[148] Political uncertainty, short-termism, and conflicting accounts on marine energy policy can further stall offshore energy transitions.[149]

[139] Karen A Alexander, 'Resource Conflict and Governance in the Transition to a More Just Estuarine and Coastal Future' in Daniel Baird and Michael Elliott (eds), *Treatise on Estuarine and Coastal Science*, vol 7 (2nd ed, Elsevier 2024); Coull, Fenton and Veith (n 75).

[140] Morrissey (n 60); Mark CJ Stoddart, Alice Mattoni and John McLevey, *Industrial Development and Eco-Tourisms: Can Oil Extraction and Nature Conservation Co-Exist?* (Palgrave Macmillan 2020); Elrick-Barr, Smith and Thomsen (n 41).

[141] Kang and Lee (n 21).

[142] Bainbridge (n 37).

[143] Shapovalova and others (n 5).

[144] Axon and Collier (n 52); Morrissey (n 60).

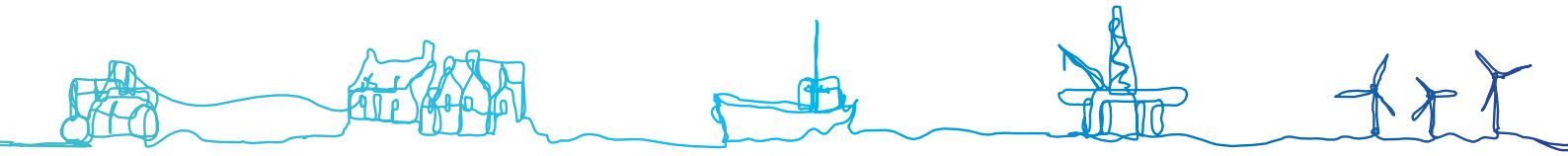
[145] Axon and Collier (n 52); Morrissey (n 60).

[146] Tomas Moe Skjølsvold and others, 'Conditions for Just Offshore Wind Energy: Addressing the Societal Challenges of the North Sea Wind Industry' (2024) 107 Energy Research & Social Science 103334 https://doi.org/10.1016/j.erss.2023.103334.

[147] Stead (n 50).

[148] Wood and Baker (n 37).

[149] Håkon E Normann, 'The Role of Politics in Sustainable Transitions: The Rise and Decline of Offshore Wind in Norway' (2015) 15 Environmental Innovation and Societal Transitions 180 https://doi.org/10.1016/j.eist.2014.11.002.



Although MSP is promoted as a way to integrate competing uses of the sea, it often falls short of its promise to deliver inclusive and participatory governance, excluding coastal communities from meaningful involvement in decision-making.[150] Instead, **national policy and industry priorities dominate strategic direction**. In Orkney, for instance, Davey notes that future energy pathways appear largely dictated by policy and industry agendas.[151]

3.6.2. Good practices from historical and contemporary marine energy transitions

One of the key good practices for just transition governance is in **local empowerment and co-management**. Across the literature, some of the clearest examples of fairer coastal transitions emerge where communities are given meaningful authority over local development. Barker's work on Scottish coastal communities shows how programmes, such as *Initiative at the Edge*, built capacity and self-reliance by combining bottom-up governance, local partnership and co-management.[152]

Operating in remote island and Highland regions facing economic decline and depopulation, this initiative enabled communities to identify priorities and design projects tailored to local needs, supported by development officers and local authorities. This approach strengthened local leadership and linked environmental stewardship to economic diversification, demonstrating the value of autonomy paired with institutional support.

Similar principles appear in more recent cases. Ackerman et al. **describe community-led governance** reform in Oregon, where collaboration among residents, researchers, and local government promoted civic participation, volunteerism, and leadership development.[153] **Partnerships** are also emphasised by Gill et al. as an important mechanism to effectively interpret data, set priorities, and monitor progress collectively.[154] These partnerships help reduce the fragmentation characteristic of marine governance, creating two-way flows of learning that allow transition processes to evolve over time.

Armitage et al. similarly highlight the role of **"bridging organisations"** that link communities, industry and government.[155] These intermediary bodies create spaces where local knowledge can inform national strategy and where policy commitments can be translated into meaningful local action. Rather than enforcing top-down decisions, they facilitate dialogue, experimentation, and the co-production of knowledge. Evidence from adaptive coastal governance frameworks in Australia reinforces the value of such cross-scale mechanisms, where iterative review and feedback enable policy and practice to remain responsive to community needs.[156]

[150] Tavis Potts, 'Social and Policy Aspects of Offshore Renewable Energy' in Trevor M Letcher (ed), *Comprehensive Renewable Energy*, (2nd ed, Elsevier 2022); Lange and Cummins (n 42).

[151] Neil Gordon Davey, 'Altered Landscapes of a Post-carbon Future: Visual Response Imaginaries as Experiences of Energy Infrastructure in the Orkney Islands' (2024) 117 Energy Research & Social Science 103719 https://doi.org/10.1016/j.erss.2024.103719.

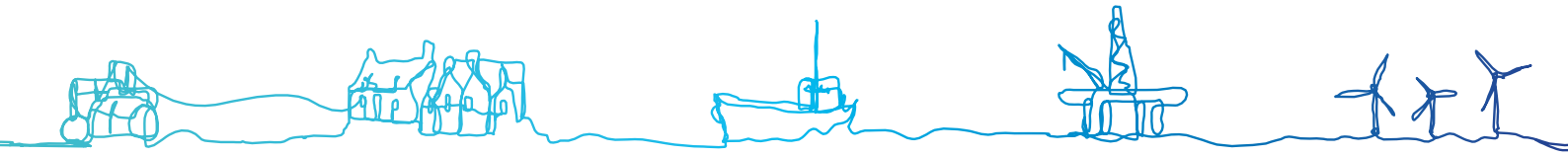
[152] Barker (n 43).

[153] Ackerman and others (n 44).

[154] Gill and others (n 44).

[155] Armitage, Charles and Berkes (n 45).

[156] Elrick-Barr, Smith and Thomsen (n 41).



Examples of effective practice also come from **integrated planning approaches** that coordinate social, economic, environmental and energy priorities within shared frameworks. Integrated marine planning efforts seek to balance emerging marine industries with existing coastal uses, using participatory co-design to align blue-economy development with community priorities and the valuation of cultural ecosystem services.[157] As intended, approaches like MSP, considering social and cultural impacts could help ensure that environmental stewardship and economic diversification support, rather than undermine, one another, making inclusive planning essential to just transition.[158] In practice, effective implementation of a truly integrated MSP requires sophisticated interdisciplinary approaches, ability to navigate multiple knowledge claims, and meaningful engagement.[159]

These examples show that where planning frameworks integrate different interests and knowledge systems, they are better able to mediate competing demands, enhance transparency and build the legitimacy essential for just transitions.

3.6.3. Just transition governance opportunities in the current marine energy transitions

The ongoing expansion of marine renewable energy presents a significant opportunity to reshape governance in ways that support fairer and more resilient coastal futures for the communities at the centre of METs. In the UK, there are already many processes underway shaping policies on offshore energy planning, licensing, authorisation, as well as community engagement and benefit. For example, the UK Parliament Scottish Affairs Committee has been undertaking an enquiry on the future of Scotland's oil and gas industry.[160] The UK Government has recently published its North Sea Future Plan, outlining its approach to managing the existing oil and gas fields, approaches to new exploration, and energy jobs transition.[161] In both the UK and Scotland, community benefits and planning obligations for renewable energy infrastructure are currently excluded from the decision-making process, with proposals and consultations to reform the current system under way.[162]

[157] Koundouri (n 47).

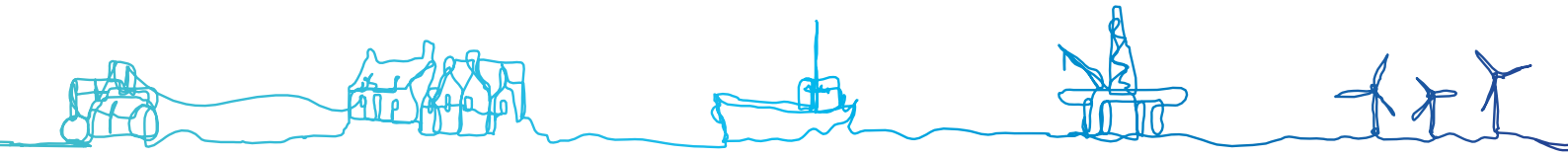
[158] Santiago Salvador and Marta Chantal Ribeiro, 'Socio-economic, Legal, and Political Context of Offshore Renewable Energies' (2023) 12 WIREs Energy and Environment e462; Lange and Cummins (n 42).

[159] Anne-Michelle Slater and others, 'Integrating Stakeholder Knowledge through Modular Cooperative Participatory Processes for Marine Spatial Planning Outcomes (CORPORATES)' (2020) 44 Ecosystem Services 101126 https://doi.org/10.1016/j.ecoser.2020.101126.

[160] Scottish Affairs Committee (n 3).

[161] UK Government, 'North Sea Future Plan for Fair, Managed and Prosperous Transition' (2025) <https://www.gov.uk/government/news/north-sea-future-plan-for-fair-managed-and-prosperous-transition> Accessed 2 December 2025 [added source].

[162] Scottish Government, 'Community Benefits from Net Zero Energy Developments: Analysis of Responses to the Consultation Exercise' (2025) <https://www.gov.scot/publications/community-benefits-net-zero-energy-developments-analysis-responses-consultation-exercise/> Accessed 2 December 2025 [added source]; UK Government, 'Community Benefits and Shared Ownership for Low Carbon Energy Infrastructure' (2025) <https://www.gov.uk/government/publications/community-benefits-and-shared-ownership-for-low-carbon-energy-infrastructure> Accessed 2 December 2025 [added source].



All of these processes reference or engage with the concept of just transition to varying degrees. It is important that these policy and regulatory reform processes are well-informed and build on the evidence base from the current coastal communities as well as the lessons learned from past transitions. To this end, literature suggests that there are a number of governance opportunities to "get this right". This section outlines some of these opportunities, derived from literature, and will inform the next steps of the project, including a detailed policy and legal analysis combined with qualitative research (see section 8).

Opportunity 1: Place-based evidence for just transition planning in coastal communities

Evidence highlights that governance responses to marine transitions have been largely reactionary, failing to anticipate cumulative socio-economic and cultural impacts on coastal communities. Housing shortages, workforce, and demographic shifts were repeatedly documented in the North Sea transitions, with local authorities struggling to expand public services quickly enough (see section 3.5.4), against a backdrop of long-term socio-economic decline in many UK coastal communities.[163] The fluctuations in the energy industry carry further risks and without proactive planning might leave coastal economies and communities vulnerable to boom-and-bust cycles. Similar risks now accompany offshore renewables expansion, perpetuating existing inequalities rather than working towards restorative, distributive, procedural, and recognition justice.

Historically, marine planning processes have been top-down, with place-based socio-economic conditions, cultural considerations, lived experience, and local knowledge often weakly reflected in decision-making, leaving local vulnerabilities or contexts poorly captured (see section 3.5.3). These processes have tended to operate at spatial and institutional scales that limit meaningful engagement to largely tokenistic forms,[164] perpetuating procedural and recognitional injustices. Adaptive governance and the geographical scaling of marine planning, for example to regional areas (e.g., Scotland's Regional Marine Plans delegated to Marine Planning Partnerships) - though with their challenges[165] - offers an opportunity to reassess how lived experiences, local contexts, and community priorities are incorporated into marine governance.[166]

Despite the integration of just transition principles in the Scottish climate legislation, and emerging acknowledgment of justice concerns at the UK policy level, there is limited regional or place-based transition planning for communities hosting energy infrastructure.[167]

[163] Scott Corfe, 'Falling off a Cliff? Economic and Social Decline by the Coast' (2019) [added source].

[164] Emma McKinley, Linda McElduff and Heather Ritchie, 'Putting People at the Centre of Marine Governance across the UK and Ireland: 20 Years of Society and the Sea' (2024) 255 Ocean & Coastal Management 107235 https://doi.org/10.1016/j.ocecoaman.2024.107235 [added source].

[165] L Greenhill, TA Stojanovic and P Tett, 'Does Marine Planning Enable Progress towards Adaptive Governance in Marine Systems? Lessons from Scotland's Regional Marine Planning Process' (2020) 19 Maritime Studies 299 https://doi.org/10.1007/s40152-020-00171-5 [added source].

[166] McKinley, McElduff and Ritchie (n 164).

[167] Daria Shapovalova and others, 'Regional Planning for a Just Transition - A Case Study for the North East of Scotland' (Just Transition Lab, Just Transition Commission 2025) [added source].

Embedding **anticipatory planning** through just transition planning, alongside more explicitly place-based, project-level statutory **socio-economic impact assessments** and **participatory scenario modelling**, would allow governance to move from reacting to socio-economic impacts after they arise towards participatorily anticipating and addressing local and regional effects earlier in the transition process, reducing the risk of unjust outcomes for affected communities. Such mechanisms should explicitly incorporate cultural identity and sense of place (see section 3.5.2), ensuring that transitions strengthen rather than erode community wellbeing.

Opportunity 2: Coordination and learning across governance levels

Governance fragmentation emerged as a structural barrier throughout the evidence review. Authority over marine spaces is dispersed across local, regional, national, and supranational actors, creating ambiguity about rights and responsibilities (see section 3.6.1). This disconnect fuels procedural injustice, with knock-on effects for other dimensions of justice, as national decarbonisation and industrial strategies often override local priorities,[168] leaving coastal communities with little influence over decisions that reshape their economies and cultural landscapes.

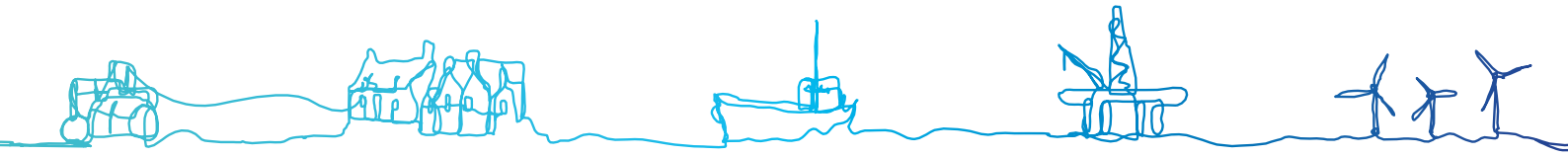
Strengthening or establishing formalised **bridging organisations** may provide one pathway to more connected governance, enabling two-way knowledge exchange between coastal communities and regional or national bodies. Although examples of cross-scale cooperation already exist,[169] these tend to be voluntary, non-statutory, short-term, project-based or dependent on individual initiatives. The opportunity lies in moving from ad hoc coordination to **stable, resourced, and mandated structures**.[170] Cross-sector forums and responsive governance structures can further support transition strategies that evolve with community feedback and changing conditions, using **participatory planning tools** to make trade-offs transparent and inclusive.[171]

[168] Bainbridge (n 37).

[169] E.g., in Scotland, Local Coastal Partnerships (LCPs) are voluntary, place-based partnerships that bring together (or 'bridge') local authorities, industry, NGOs, regulators and other stakeholders to support integrated coastal management through coordination and knowledge exchange.

[170] E.g., in England, Inshore Fisheries and Conservation Authorities (IFCAs) offer an example of a mandated, place-based bridging organisation. Established under the Marine and Coastal Access Act 2009, they are statutory and funded bodies (partially funded by the Local Authorities and Defra) operating at the interface between local fisheries, local authorities, and national marine governance.

[171] E.g., Slater and others (n 159).



These arrangements, when formalised and properly supported, could help to ensure that social, cultural and economic considerations sit alongside energy and environmental priorities in shaping transition pathways.

The fragmentation of authority and decision-making in marine renewables arises not simply from the numbers of actors involved, but from the separation of planning, leasing, and authorisation across multiple agencies operating at different scales, with distinct mandates (e.g., Table 3). This pattern reflects broader analyses of European marine governance, which show how decades of sector-specific and uncoordinated policy development have produced a highly fragmented regulatory landscape with unclear responsibilities across scales.[172] Meaningfully integrating local interest and concerns in this context is challenging for all stakeholders involved – industry, communities, and decision-makers – due to constraints in capacity, access to integrated data, and limited coordination across governance levels.

Opportunity 3: Clear and consistent community benefit pathways

Evidence has consistently pointed to the problematic distribution of burdens and benefits for coastal communities during METs (see section 3.5). The current transition to offshore renewable energy offers an opportunity to improve understanding of what constitutes burdens and benefits in this context, and to formalise how communities share in the value created.

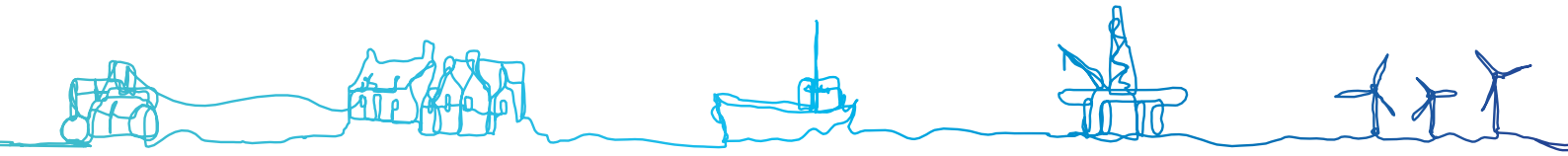
The current community benefit arrangements are voluntary, inconsistent, and dependent on developers' internal practices and goodwill. Recent consultation processes show that there is little consensus across a number of key procedural and substantive issues related to benefits from offshore renewables.[173]

While this applies to all communities hosting energy infrastructure, the coastal community dynamics adds further challenges as there is little consensus on what constitutes a "local community" in this context – with views ranging from relevant local authority areas to those geographically closest to development and related onshore infrastructure.[174]

[172] Suzanne J Boyes and Michael Elliott, 'Marine Legislation – The Ultimate "Horrendogram": International Law, European Directives & National Implementation' (2014) 86 Marine Pollution Bulletin 39 https://doi.org/10.1016/j.marpolbul.2014.06.055 [added source].

[173] Scottish Government (n 162).

[174] ibid.



There is a need for further **research into policy and regulatory arrangements and good practices that deliver meaningful and sustainable economic gains for coastal communities**, including opportunities for local value retention, community wealth building, and forms of ownership.Communities express clear desire for benefits to be transparent and predictable, aligned with locally defined priorities, and have adequate time and support for negotiation.[175] The current reform processes provide an opportunity to support both the coastal communities and offshore energy developers by moving towards structured, possibly statutory mechanisms linked to the licensing, leasing, and authorisation processes.

There were, for example, recent calls to appoint a Minister for the Coastal Communities to "help tackle the unique set of issues that coastal communities face" and develop a national coastal communities strategy.[176]

Opportunity 4: Investment in long-term community capacity and locally-led action

The lack of community capacity to both participate in formal decision-making and in shaping the future visions of coastal places is extensively highlighted in the evidence (see particularly sections 3.5.2 and 3.5.3).

This is especially acute in the context of disproportionate deprivation in many of the UK's coastal regions.[177]

The consultation on community benefits in Scotland highlighted that while there is wide support of the view that decision-making should be led and controlled by the relevant community, there were also concerns that local bodies, like community councils, "may be too small or lack capacity and resources to take on such a function".[178]

Many lack the financial, organisational or technical resources needed to engage effectively with complex planning procedures or evaluate proposed developments. In response to these constraints, there are examples of communities pooling capacity and resources to strengthen their ability to engage collectively[179] **Investing in stable, long-term capacity** - through support for community anchor organisations, leadership programmes, technical assistance and development officers - would allow communities to participate on equal footing with developers. It would also enable them to initiate community-owned or co-owned energy projects where appropriate. Building this sustained capacity is essential for ensuring that transitions align with local priorities, lived experiences and aspirations for the future.

[175] ibid.

[176] UK Parliament, 'Minister for Coastal Communities - Early Day Motions' <https://edm.parliament.uk/early-day-motion/63304/minister-for-coastal-communities> Accessed 2 December 2025 [added source].

[177] Cassie Barton and others, 'The Future of Coastal Communities' (House of Commons Library 2022) <https://researchbriefings.files.parliament.uk/documents/CDP-2022-0153/CDP-2022-0153.pdf> Accessed 1 December 2025 [added source].

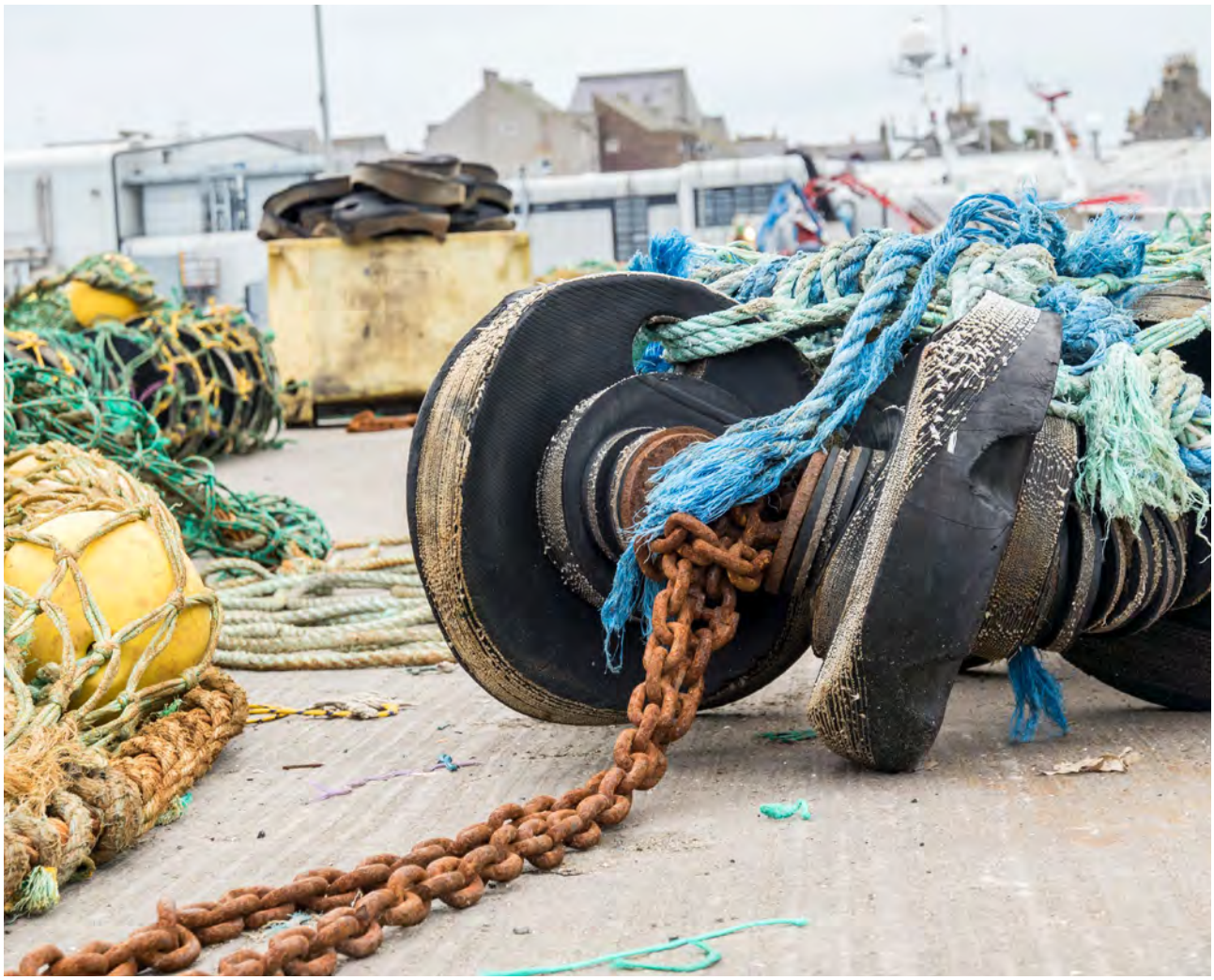
[178] Scottish Government (n 162).

[179] E.g., The 9CC group is made up of nine communities in Cumnock and the Doon Valley area, Scotland. It aims to strengthen the communities by working collaboratively to provide access to financial resources, and empower communities to make their own decisions based on local needs and knowledge.

3.7 Conclusions

METs represent a profound transformation of coastal economies, cultures, and governance systems. Historically, shifts from whaling to oil and gas, and now to marine renewables, have been driven by resource depletion, environmental imperatives, and global policy commitments. While these transitions have enabled industrial growth and national energy security, they have also produced uneven social and economic outcomes, leaving many coastal communities vulnerable to structural dependency, cultural erosion, and procedural exclusion.

The evidence reviewed in this section underscores that justice in METs cannot be reduced to economic metrics or employment figures alone. Fairness must be understood through the interlinked dimensions of distributive, procedural, recognitional, and restorative justice. Coastal communities often bear disproportionate burdens while benefits flow outward to distant investors and national economies. Without deliberate governance interventions, current marine renewable energy expansion risks replicating these patterns of inequity. This report will now turn to the three case studies of METs in the UK – Orkney (section 4), North East Scotland (section 5), and the Humber Estuary (section 6).



4. Energy Transition on the Islands: Justice and Change in Orkney's Maritime Economy

4. Energy Transition on the Islands: Justice & Change in Orkney's Maritime Economy

4.1. Background

Orkney's history and development have long been shaped by its close connection to the sea and its maritime setting. Marine-based activities have underpinned Orkney's economy, livelihoods and cultural identity, reinforced by distinct governance arrangements such as Udal law.[180] From the eighteenth to the early twentieth century, the islands' economy was characterised by traditional and extractive industries including fishing, kelp burning,[181] whaling and coastal trade.[182] These activities supported multi-occupational households and sustained the close relationship between land and sea that structured everyday life.[183] Although each industry rose and declined at different times, together they established enduring patterns of work, settlement, and resource use that continued to shape Orkney into the twentieth century and today.

A major shift occurred in the 1970s with the development of the North Sea oil industry. Orkney's deep and sheltered natural harbour at Scapa Flow, its strategic position in the northern North Sea, and its past use as a naval base during the first and second World Wars,[184] led to the construction of the Flotta oil terminal and associated harbour and service infrastructure.[185] This period brought significant industrial change, including new employment opportunities, population growth, and capital investment.[186]

The oil era also introduced new forms of local governance and resource management, such as the Oil Reserve Fund, as Orkney County Council sought greater control over marine and harbour development and to channel revenues into local services and infrastructure.[187] These developments strengthened Orkney's role within wider offshore energy systems but also brought rapid social and economic adjustments that creating new and different pressures and opportunities.

Since the early 2000s, Orkney has undergone further transformation as the hub for renewable energy innovation. The establishment of the European Marine Energy Centre (EMEC), a world-leading test site for wave and tidal energy technologies,[188] hydrogen demonstration projects and expanded grid and harbour developments, have positioned the islands at the forefront of marine renewables research.[189]

[180] Udal law is a Norse legal system of land ownership, found in Orkney and Shetland. Udal title extends to the lowest ebb unlike the general law in the rest of Scotland and the UK, where the foreshore is generally presumed to be owned by the Crown. See Alexandra Campbell, 'Extractive Poetics: Marine Energies in Scottish Literature' (2019) 8 Humanities 16 https://doi.org/10.3390/h8010016.

[181] William PL Thomson, *Kelp Making in Orkney* (Orkney Press 1983) [added source].

[182] Dan Lee and Sean Bell, 'From Peat Spade to Tangle Trade: The Industrial Heritage of the North Isles' (2025); Fenton A, *The Northern Isles: Orkney and Shetland* (Donald 1978) [added source].

[183] George Barry, *The History of the Orkney Islands* (2nd ed, D Willison 1808).

[184] Geoffrey Stell, 'The Rolt Memorial Lecture 2018: Science and Engineering at War in Orkney' (2019) 41 Industrial Archaeology Review 80 https://doi.org/10.1080/03090728.2019.1656930 [added source].

[185] H Chen, 'Field Development of the Scapa Field: A Marginal North Sea Field' [1988] Europace [added source].

[186] Johnson, Kerr and Side (n 8).

[187] HA Graeme Lapsley, 'The Community Impact of North Sea Oil' *Onshore Impacts of Offshore Oil* (1st ed, CRC Press 1981); K Johnson, S Kerr and J Side (n 8); Nicolson (n 68).

[188] Marcello Graziano, Suzannah-Lynn Billing and Lucy Greenhill, 'What Future for the Energy-Rich Scottish North? Changes in the Economic Landscape of the Highlands and Isles, and the Rest of Scotland' (Regional Studies Association 2014).

[189] Laura Watts, Energy at the End of the World: *An Orkney Islands Saga* (The MIT Press 2018).

This contemporary phase attracted external investment and partnerships while fostering community-led energy initiatives and new narratives of sustainability and technological leadership.[190] However, it also introduced new dependencies, regulatory complexities and expectations, reflecting the challenges of managing successive energy transitions in a small island setting.

Orkney's development can be considered through three broad phases reflecting major shifts in its marine and energy economy:

1) an early period dominated by traditional and extractive maritime industries;

2) the oil and harbour modernisation era of the 1970s to early 2000s; and

3) the contemporary renewables-focused phase from the 2000s onwards.

This temporal framing, while not a continuous chronology, provides a basis for examining how governance, work, identity, and resource access have evolved across successive METs.

Despite multiple transitions, the justice implications of these changes in Orkney's marine-based industries, received little attention. Existing literature tends to emphasise economic opportunity and technological innovation, with less focus on how transitions are experienced by communities, how benefits and burdens are distributed and understood locally, or how concerns about fairness and influence are articulated over time. By examining the justice narratives associated with past METs in Orkney, this section explores the expectations and vulnerabilities that affect how communities respond to current and future METs.

4.2. Results overview for Orkney

Following two screening phases, 60 records were included in the database for evidence extraction. A further eight were excluded during detailed review based on relevance and geography. The final Orkney database comprised 52 sources.

The majority of the reviewed materials were peer-reviewed academic publications (*n* = 35). A further 15 sources were books and personal accounts, offering narrative historical and lived-experience insights into transitions in Orkney. One source was from local government and one from industry.

The publication dates of Orkney materials ranged from 1808 to 2025. Seven sources were published before 1980, reflecting earlier historical and descriptive accounts of coastal life, cultural identity and the region's traditional industries. Eight sources were published between 1980 and 2000, a period shaped by the development of the Flotta oil terminal. Most materials (*n* = 37) were published from 2000 onwards, corresponding to the region's diversification beyond oil, the establishment of EMEC, and an expanding research interest in marine renewables, community energy, governance reform and net-zero transitions. Much of this later literature includes retrospective historical work, policy analyses and social-scientific studies that revisit earlier periods through contemporary research priorities. The following sections analyse governance, economic, and social dimensions of these transitions, drawing on the reviewed sources.

[190] Lasse Okkonen and Olli Lehtonen, 'Socio-Economic Impacts of Community Wind Power Projects in Northern Scotland' (2016) 85 Renewable Energy 826 https://doi.org/10.1016/j.renene.2015.07.047.

4.3. Marine energy transitions in Orkney

This section explores how governance, economic structures, and community identity evolved across three phases of MET. Governance shapes how power and wealth are distributed in marine industries, and how decisions are made. The economic and workforce section provides qualitative and quantitative accounts of the impacts of METs in Orkney. Finally, community identity and social cohesion reflect how the METs reshape the cultural fabric and social relations. Throughout the section, the previously defined ideas of justice underpin the analysis of the identified sources.

4.3.1 Governance, authority, and wealth distribution

1) Traditional & extractive (18th century – early 20th century)

Governance in Orkney during the traditional maritime economy was rooted in feudal land tenure, concentrating power and wealth among landowners. Barry observed that rents from the largest estates were

> *"drawn by men who do not reside in the Islands, and are in great measure spent in another country... or, if they are not carried out of the Islands they have hitherto been spent in luxury or diverted to such purposes as have produced no beneficial effect to the community".*[191]

Feu-duties were also a feature, imposing a heavy burden on small proprietors entrenching hierarchies dictating resource access and control.[192]

Obligations such as Crown rent further reinforced this hierarchy - in good years, when harvests were successful, more than half of the islands' surplus produce had to be exported in kind, and in poorer years cash had to be raised instead.[193] As a result, even when Orkney recorded more exports than imports, the local population saw limited benefit, and the islands remained comparatively poor.[194]

Such governance arrangements shaped the trajectory of Orkney's maritime economy. The kelp trade, while not an energy source *per se*, was central to the region's economy and illustrates the upward wealth flow - from the tenants and cottars who laboured on the shore to the lairds who captured most of the financial returns. The rise of kelp coincided with a neglect of Orkney's rich fishing potential,[195] as landlords prioritised kelp for its profitability and security.[196]

Kelp burning became unpopular not necessarily because of the hard work and long hours, but due to what Struthers describes as the "compulsion and inequality of the reward",[197] an early example of distributional injustice. The inequality of the reward meant that landowners typically retained about three-quarters of the selling price as clear profit,[198] and, rather than reinvesting this into the

[191] Barry (n 183).

[192] Feu duty was an annual payment, unique to Scottish law, made by a tenant (feuar) of land to the owner (superior) in return for the right to use the land. ibid.

[193] Crown rent was a rent payment made by a tenant to the Crown for land that was granted to them. WR Scott, 'The Trade of Orkney at the End of the Eighteenth Century' (1913) 10 The Scottish Historical Review 360.

[194] ibid.

[195] Malcolm Gray, *The Fishing Industries of Scotland, 1790-1914 a Study in Regional Adaptation* (Oxford University Press for the University of Aberdeen 1978).

[196] Barry (n 183).

[197] JM Struthers, *Broch Island: A History of the Island of Burray in Orkney* (J M Struthers 2013).

[198] ibid.

agricultural land which was in a "poor state" at that time,[199] lairds "preferred to enjoy an enhanced lifestyle, building themselves comfortable town houses in Kirkwall and socializing on an extravagant scale".[200] Wealthy landowners and families "with whole islands to their names" were best positioned to benefit the most from kelp production.[201]

Kelp provided a buffer for lairds protecting them from bankruptcy during crop failures,[202] yet for tenants it created dependency meaning that its collapse in 1832 left many destitute and with no other option but to leave Orkney.[203] Employment with the Hudson Bay Company, for example, offered far better wages working in Canada; many Orcadians left and later returned home able to buy their own farms, settle down, and raise a family.[204] These patterns show how unequal access to wealth and power shaped people's livelihoods, creating conditions that contributed to dependency and outward migration.

2) Oil and gas & harbour modernisation (1970s – early 2000s)

Since the inception of the oil and gas industry in the UK, its governance has been highly centralised with the UK Government and associated agencies making policies and decisions on licensing rounds and specific development authorisations. North Sea oil brought governance changes to Orkney aimed to gain some local autonomy.[205] Anticipating social and economic disruption from large-scale industrialisation, Orkney County Council secured unique legislative powers through the Orkney County Council Act (1974), enabling jurisdiction over harbours, licensing, construction and compulsory land acquisition,[206] powers usually sitting with national government. These powers allowed Orkney County Council to channel revenues from disturbance agreements back into local development via the Reserve Fund,[207] distributing some of the economic benefits of the oil and gas industry to the wider community and those most impacted by the arrival of the industry.[208] This created a model of community benefit sharing unprecedented in the UK.[209] Additionally, through maintaining a controlling interest in the Orkney Towage Company, which provided a tugboat and steerage service to oil tankers arriving at Flotta Terminal, profits were invested directly back into Orkney's communities.[210]

[199] Douglas P Willis, *Moorland and Shore Their Place in the Human Geography of Old Orkney* (Department of Geography, University of Aberdeen 1983).

[200] Struthers (n 197).

[201] Willis (n 199).

[202] ibid.

[203] Charles Maclean, *The Fringe of Gold the Fishing Villages of Scotland's East Coast,Orkney & Shetland* (Canongate 1985).

[204] Struthers (n 197).

[205] Nicolson (n 68).

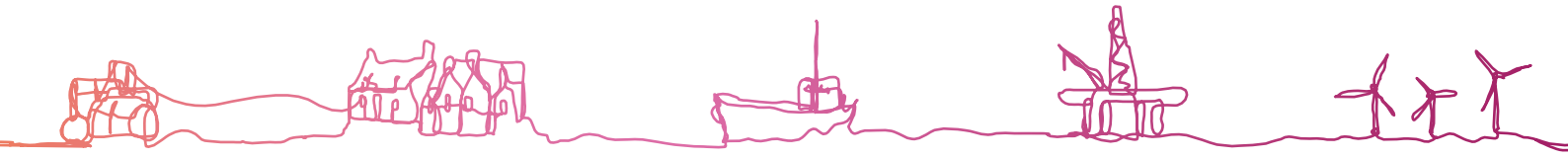
[206] ibid; Johnson, Kerr and Side (n 8).

[207] Lapsley (n 187).

[208] Johnson, Kerr and Side (n 8).

[209] ibid.

[210] John Alan Anderson, 'An Analysis of North Sea Oil Development and Scottish Island Youth: Postmaterialism as an Identifiable and Measurable Dimension' (University of New Hampshire 1993); Lapsley (n 187).



However, critiques emerged around the inclusiveness of governance during the oil era. Evidence suggests that outer islands and smaller parishes often felt excluded from meaningful participation in decisions shaping oil development.[211] Consultation processes were perceived as tokenistic, with calls for statutory devolution of powers to district councils to ensure local control over infrastructure and resource allocation.[212] Limited transparency, exacerbated by oil companies' reluctance to disclose plans, further reinforced feelings of restricted local influence over decision-making.[213]

Alongside formal mechanisms for revenue redistribution, informal community action also shaped outcomes. In 1976, widespread local objection to Occidental Consortium's proposed infrastructure extension was used to exert public pressure and leverage community benefits, including fixing or upgrading island roads, making the island airport operational, providing classrooms at the school, funding a new community centre, and establishing a prompt grievance procedure.[214]

To sum up, while Orkney pioneered benefit-sharing and secured mechanisms to retain some local revenues, meaningful influence over development remained uneven, relying heavily on community pressure rather than embedded participatory processes.

3) *Renewable energy and diversification (2000s – present)*

The governance of renewables in Orkney has continued the energy governance centralisation trend to a large extent.[215] Decision-making over large and offshore renewables sits largely within national frameworks dominated by the Scottish Government, Crown Estate [Scotland] for seabed leasing and Marine Scotland for licensing.[216] The agencies are supported by 'agents for change'[217] who help co-ordinate and facilitate change within communities.[218]

[211] Howie Firth, 'Whither Orkney and Shetland' (Orkney Library & Archive 1976); Lapsley (n 187).

[212] Firth (n 211).

[213] Lapsley (n 187).

[214] David Sinclair, *Tomorrow Is a Whole New Day: Life on an Orkney Island like No Other* (The Orcadian 2015).

[215] Johnson, Kerr and Side (n 8).

[216] Glen Smith and Svein Jentoft, 'Marine Spatial Planning in Scotland. Levelling the Playing Field?' (2017) 84 Marine Policy 33 https://doi.org/10.1016/j.marpol.2017.06.024; Sandy Kerr and others, 'Rights and Ownership in Sea Country: Implications of Marine Renewable Energy for Indigenous and Local Communities' (2015) 52 Marine Policy 108 https://doi.org/10.1016/j.marpol.2014.11.002.

[217] The terms "agents for change" or "change agents" are used across disciplines, but there is no single, settled definition; instead, the term is applied broadly to actors that facilitate change within different institutional and governance contexts. The definition used in Billing (n 37) with specific reference to Marine Renewable Energy (MRE) is "*An agent for change is anyone who has the vision, skill, and power to stimulate, coordinate and facilitate change within the context of MRE development*".

[218] Billing (n 37); Suzannah-Lynn Billing, 'The People Who Want to Facilitate New Marine Industries; Agents for Change and the Development of Wave Energy in Scotland' (MASTS: Annual Science Meeting 2016).

Centralisation also extends to procedures and processes. Watts describes how the Crown Estate in 2010 seabed leasing round for wave and tide energy "had closed large areas of inshore fishing grounds" without notice or negotiation to local residents and workers, fuelling perceptions of procedural injustice and insecurity.[219]

Orkney was involved in the 2010-2016 piloting of Marine Spatial Planning (MSP) for Pentland Firth and Orkney Waters. Although MSP is meant to be "rooted in the principles of good governance, including participation and transparency",[220] the evidence suggests that these processes are often "power-loaded", reproducing existing hierarchies,[221] and with decision making ultimately influenced by monetary value rather than wider socioeconomic considerations.[222] Participation barriers for communities remain high "when they are expected to speak the language of policymaking" in the MSP process.[223] A lack of trust amongst fisher communities of governmental authorities inhibits the mobilisation of linking capital amongst fishermen, obstructing the ability to access power through cross-scale networks.[224] A heritage-focused perspective argues for documenting governance and energy transitions as part of Orkney's cultural legacy, suggesting an Energy Heritage Strategy to capture oral histories and archival material during ongoing change,[225], aligned with calls for governance that incorporates cultural heritage and social dimensions via participatory frameworks.[226]

In terms of local income distribution, marine renewable energy governance has so far offered few mechanisms for direct community benefit. Johnson et al. note that the centralised UK marine planning regime means that there is "limited requirement [for developers] to engage directly with local planning processes",[227] providing little encouragement for developers to consider community benefit. Kerr et al. similarly highlight concerns that expenditure by external contractors "fails to stick in the local economy".[228] Although community benefit payments are common in onshore wind, this is not the same for offshore renewables, with proposals and consultations to reform the current system under way.[229] Without local planning control in the marine environment, it is unclear what incentives there are for marine industries to make community benefit payments to coastal communities.[230]

[219] Watts (n 189).

[220] Smith and Jentoft (n 216).

[221] Yannick W. Bakker, Jessica de Koning and Jan van Tatenhove, 'Resilience and Social Capital: The Engagement of Fisheries Communities in Marine Spatial Planning' (2019) 99 Marine Policy 132 https://doi.org/10.1016/j.marpol.2018.09.032.

[222] Andronikos Kafas and others, 'ScotMap: Participatory Mapping of Inshore Fishing Activity to Inform Marine Spatial Planning in Scotland' (2017) 79 Marine Policy 8 https://doi.org/10.1016/j.marpol.2017.01.009.

[223] Yannick W. Bakker, de Koning and van Tatenhove (n 221).

[224] ibid.

[225] Daniel Lee and Gareth Talbot, 'Orkney Energy Heritage Strategy Phase 1: Scoping' (2023).

[226] Kath Behrendt and others, 'Natural Capital Assessment of the Orkney Marine Region Area for the Scottish Wildlife Trust' (2022).

[227] Johnson, Kerr and Side (n 8).

[228] Kerr and others (n 39).

[229] Scottish Government (n 162); UK Government (n 162).

[230] Sandy Kerr and others, 'Rights and Ownership in Sea Country: Implications of Marine Renewable Energy for Indigenous and Local Communities' (2015) 52 Marine Policy 108 https://doi.org/10.1016/j.marpol.2014.11.002.

Examples of community benefit payments from offshore renewables do exist, there is divergence in practice and the level of funds remains relatively low. [231]

Community-led initiatives have emerged to counter the centralisation of energy governance and to retain the benefits of local energy generation. Development trusts, such as Shapinsay's, have gained local influence by owning their own renewable energy assets. [232] Community-owned energy can create "unique political opportunities" for the governing organisation, generating income to be distributed to the public, "adding to, replacing, and shaping" local government processes. [233] However, community energy projects generally face a number of challenges in terms of planning, authorisation, and financing, as well as community capacity. Benefits from these projects are contingent on stable policy support and grid access. [234]

4.3.2. Economic and workforce transitions

1) Traditional & extractive (18th century – early 20th century)

From the 18th to the early 20th century, Orkney's economy was characterised by overlapping maritime and land-based activities, including crofting, kelp burning, small-scale trade, and, later, commercialised fisheries. These activities rarely provided secure, year-round livelihoods. Most households combined crofting with seasonal fishing and casual maritime labour, with incomes shaped by weather conditions, market volatility, and limited access to capital. This economic structure was inherently fragile, leaving communities highly vulnerable to external shocks and global market forces.

The evolution of the fish industry illustrates this precarity. While fishing has long formed part of Orkney's mixed economy – including evidence of surplus production and long-distance dried fish trade in the Norse period [235] - more organised, commercially orientated activity took place during the 18th century, with planned stations such as Stronsay established to industrialise cod and herring fisheries. [236]

Seasonal herring booms in the late 19th century brought short-term prosperity, attracting thousands of migrant gutters and packers to Orkney. [237] However, these booms were unpredictable and unsustainable. Environmental pressures, including overfishing, ultimately contributed to industry decline, reinforcing long-term economic insecurity for local communities. Gendered labour patterns were central to this transition as women's work in herring gutting and salting was highly seasonal and short-term. [238]

[231] John Glasson, 'Community Benefits and UK Offshore Wind Farms: Evolving Convergence in a Divergent Practice' (2020) 22 Journal of Environmental Assessment Policy and Management 2150001 https://doi.org/10.1142/s1464333221500010.

[232] Michael Westrom, 'Winds of Change: Legitimacy, Withdrawal, and Interdependency from a Decentralized Wind-to-Hydrogen Regime in Orkney, Scotland' (2020) 60 Energy Research & Social Science 101332 https://doi.org/10.1016/j.erss.2019.101332.

[233] ibid.

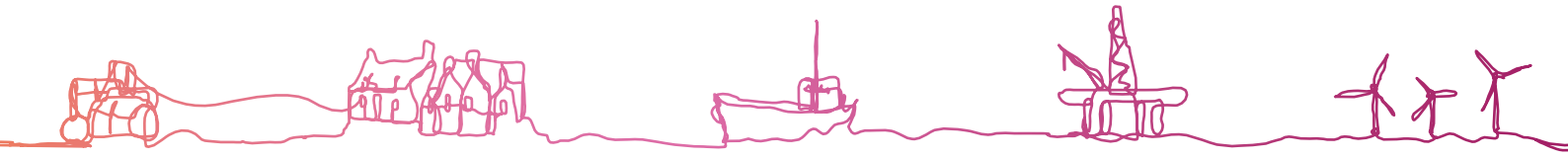
[234] Esther C van der Waal, 'Local Impact of Community Renewable Energy: A Case Study of an Orcadian Community-Led Wind Scheme' (2020) 138 Energy Policy 111193 https://doi.org/10.1016/j.enpol.2019.111193; Westrom (n 232).

[235] James H Barrett, 'Fish Trade in Norse Orkney and Caithness: A Zooarchaeological Approach' (1997) 71 Antiquity 616 https://doi.org/10.1017/s0003598x00085367.

[236] Willis (n 199).

[237] Maclean (n 203); Bryce Wilson, *Stromness: A History* (The Orcadian Limited Kirkwall Press 2013).

[238] Willis (n 199).



The kelp industry followed a similar pattern. From the early 18th century, kelp burning became a lucrative source of alkali for soap and glassmaking, dominating Orkney's export trade by 1800.[239] As previously discussed (section 4.3.1), while landowners benefitted from high profit margins, workers received minimal earnings.[240] The removal of import duties on barilla[241] in 1832 led to a rapid collapse of the kelp market, leaving tenant families who depended on kelp gathering facing severe hardship and displacement, and with no safeguard against the downturn.[242]

Whaling and recruitment by the Hudson Bay Company offered Orcadian men opportunities for comparatively higher wages abroad, but at significant social cost. In 1779, more than three-quarters of the company's workers were from Orkney,[243] and by 1800, 418 of 524 employees were Orcadian,[244] reflecting the scale of outmigration. Whaling ships typically recruited 20–25 men, and in 1824 around 700 Orcadians went whaling; even in 1841, when the industry was past its peak, 292 men were still recruited.[245] These figures illustrate the scale of workforce transition away from local crofting and fishing toward distant, seasonal employment. While such work provided income, long absences and uncertainty placed considerable strain on households and underscored the fragility of local employment systems.[246]

2) Oil and gas & harbour modernisation (1970s – early 2000s)

The discovery and development of North Sea oil in the 1970s marked a profound economic and social transformation for Orkney. The construction of the Flotta oil terminal in Scapa Flow turned a former naval anchorage into a major industrial hub, generating employment and infrastructure investment while introducing new forms of economic volatility and structural dependence.

Oil development produced a surge in employment, particularly during the construction phase, benefitting both local businesses and a temporary workforce.[247] At its peak, the Flotta terminal employed around 288 permanent staff, 230 of whom were Orcadian, alongside thousands of short-term positions for incomers.[248] Irish contract workers dominated the construction-phase workforce, with up to 1,000 men housed in purpose-built camps and a further 200 Orcadians commuting daily by boat.[249] This influx reversed decades of population decline, with Orkney's population increasing by 6% between 1971 and 1981 to reach 19,056.[250]

[239] Struthers (n 197).

[240] Willis (n 199).

[241] Barilla was an alkali-rich ash produced from the burning of the saltwort plant (*Salsola sativa*) also used for making glass and soap. It was imported to the UK from Spain and the Mediterranean and was considered a higher quality to Orkney's locally produced kelp.

[242] Maclean (n 203).

[243] Struthers (n 197).

[244] Wilson (n 237).

[245] Struthers (n 197).

[246] ibid; Kate Towsey, *Orkney and the Sea: An Oral History* (Orkney Heritage 2002).

[247] Occidental North Sea Consortium, *Flotta Oil Handling Terminal, Orkney* (Occidental North Sea Consortium 1985).

[248] Lapsley (n 187); Sinclair (n 214).

[249] Sinclair (n 214).

[250] Nicolson (n 68); Carole L Seyfrit and Lawrence C Hamilton, 'Who Will Leave? Oil, Migration, and Scottish Island Youth' (1992) 5 Society & Natural Resources 263 https://doi.org/10.1080/08941929209380791.

However, the boom was short-lived and once construction ended, employment contracted sharply. Despite the promise of prosperity, oil development failed to address the persistent challenge of youth outmigration.[251] Seyfrit and Hamilton found no evidence that oil jobs altered long-term migration trends, and net migration soon returned to negative levels.[252]

The economic benefits of the oil boom were unevenly distributed and accompanied by significant social costs. High wages paid to construction workers distorted local labour market, forcing local firms to raise bonuses to retain staff and driving up building costs.[253]

Housing pressures intensified, with rental prices increasing tenfold during the boom period, leaving many local families struggling to secure accommodation.[254] Early planning studies warned that the rapid pace of oil development risked creating a 'one-footed economy' characterised by inflation, housing shortages, and dependency on short-term jobs,[255] challenges that subsequently materialised.

Although oil revenues were partly channelled into reserve funds supporting infrastructure and community development (section 4.3.1), income leakage limited local economic gains. A substantial share of construction spending and wages flowed to external contractors and incomers, reducing the multiplier effect within Orkney's economy.[256]

3) *Renewable energy and diversification (2000s – present)*

The oil and gas sector continues to play an important role in Orkney's economy, with accumulated revenues and policy experience providing a foundation for the development of the emerging Blue Economy sectors.[257]

The establishment of the EMEC in 2003 and subsequent Crown Estate (Scotland) leasing rounds positioned Orkney as a local testbed for marine renewable energy, promising economic revitalisation and new opportunities for local communities. EMEC has attracted technology developers and academic partnerships, supporting local employment and skills development in renewable energy.[258] EMEC's activities alone are estimated to have generated around 300 jobs locally.[259]

[251] Adam Barker and Philip Allmendinger, 'Towards a Socio-economic Analysis of Scotland's Coastal Areas' (2004) 47 Journal of Environmental Planning and Management 881 https://doi.org/10.1080/0964056042000284844.

[252] Seyfrit and Hamilton (n 250).

[253] Lapsley (n 187).

[254] ibid.

[255] Helga Busemann, *The Pace of Oil and Gas Development in Scotland (1970-1977): Pointers for American Planners* (New Jersey Department of Environmental Protection 1978).

[256] Johnson, Kerr and Side (n 8); Lapsley (n 187).

[257] Marcello Graziano and others, 'A Room with a Blue View: The Impact of Blue Economy Activities on Housing Prices across Scottish Regions' (2025) 117 Journal of Rural Studies 103632 https://doi.org/10.1016/j.jrurstud.2025.103632.

[258] Ed Atkins, *A Just Energy Transition: Getting Decarbonisation Right in a Time of Crisis* (Bristol University Press 2023); Adam McGeoch and others, 'Orkney Islands Economic Review' (2020).

[259] McGeoch and others (n 258).

Offshore renewable energy was viewed as a means of facilitating a just transition by providing potential future employment for oil and gas industry workers, who had many of the requisite skills.[260] Community and development trusts have reinvested revenues from renewable energy projects into housing improvements, transport schemes, and social infrastructure, contributing to local resilience.[261] Emerging marine renewable technologies have also been framed as an opportunity to advance energy justice by ensuring that the benefits of decarbonisation reach peripheral communities.[262]

Nevertheless, despite the economic benefits of renewable energy developments for Orkney,[263] significant vulnerabilities persist. Distributive justice concerns remain where local communities bear the costs of development, including cultural disruption and visual impacts, while a large share of economic benefits accrues to external actors.[264] Even community-led projects, often seen as a way to empower local communities, do not always deliver broad-based benefit. Community wind schemes can concentrate profits among small groups of shareholders,[265] and remain highly exposed to policy volatility, including subsidy withdrawal.[266]

Employment linked to marine renewables and hydrogen projects, while valuable, is frequently concentrated in short-term construction phases rather than stable, long-term roles.[267] Policy ambitions to redeploy oil and gas workers into renewables have had limited success, as skill mismatches and technical shortages persist.[268]

Economic precarity is compounded by the paradox of energy abundance alongside persistent fuel poverty. Despite generating more renewable electricity than it consumes, Orkney has among the highest fuel poverty rates in the UK. In 2014, 63% of households were classified as fuel poor, and by 2017 many experienced "quadruple fuel poverty", spending more than 40% of income on heating.[269] Structural factors, including ageing housing stock and low incomes, reinforce these inequities.[270] Geographic isolation amplifies these challenges, with high transport costs and fragile supply chains increasing communities exposure to disruptions.[271] While development trusts have sought to mitigate these vulnerabilities, their effectiveness remains contingent on sustained policy support and long-term infrastructure investment.[272]

[260] Rhys James Howell, 'In Sight and in Mind: Social Implications of Marine Renewable Energy' (University of Edinburgh 2019).

[261] Watts (n 189).

[262] Lara M Santos Ayllón, 'A Justice and Responsible Research and Innovation Exploration of Marine Renewables and Green Hydrogen in Island Communities' (2022) 4 Science Talks https://doi.org/10.1016/j.sctalk.2022.100086.

[263] Grant J Allan and others, 'Concurrent and Legacy Economic and Environmental Impacts from Establishing a Marine Energy Sector in Scotland' (2008) 36 Energy Policy 2734 https://doi.org/10.1016/j.enpol.2008.02.020.

[264] Johnson, Kerr and Side (n 8); Davey (n 151).

[265] Watts (n 189).

[266] van der Waal (n 234).

[267] Bill Slee, 'Fossil Fuel Decline and the Rural Economy: The Case of Scotland' in Geoffrey Wood and Keith Baker (eds), *The Palgrave Handbook of Managing Fossil Fuels and Energy Transitions* (Palgrave Macmillan 2020).

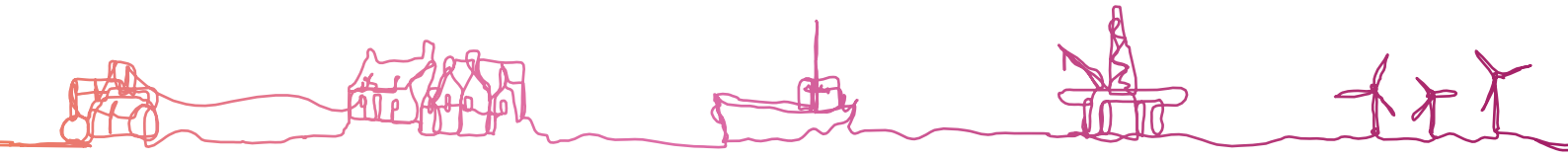
[268] L Smith, D Woolf and D Mackay, 'Turning Marine Energy into Reality: The Scottish Experience' (2009) 162 Proceedings of the Institution of Civil Engineers 197.

[269] Watts (n 189).

[270] Davey (n 151).

[271] Campbell (n 180).

[272] Westrom (n 232); van der Waal (n 234).



4.3.3. Community identity and social cohesion

1) Traditional & extractive (18th century – early 20th century)

Community identity during the traditional maritime period was deeply rooted in coastal work and seafaring traditions. Oral histories and historical accounts show that fishing, kelp gathering and whaling were not only economic activities but integral to social life and collective resilience.[273] These seasonal interactions meant that communities regularly encountered groups who were present only temporarily, contributing to local distinctions between those embedded in island life and those whose involvement was transient.

External perceptions of Orcadians also shaped local identity. Francis notes that whaling captains "came to favour the islanders over the other seamen",[274] indicating that Orcadian workers held a strong reputation within wider maritime industries. This form of external recognition mattered not only economically but socially, reinforcing a sense of worth and capability tied to maritime skill and reliability.

Outward mobility formed another visible part of community experience. Coull describes how emigration from Westray increased in the late nineteenth century as opportunities overseas expanded, as well as the collapse of kelp in 1832,[275] resulting in "a steep decrease in numbers".[276] Maclean similarly highlights the extent of Orcadian involvement in whaling and Hudson Bay Company employment.[277] While these dynamics are discussed elsewhere in terms of labour and economic change (section 4.3.2), here they indicate that movement away from the islands was a routine feature of life, shaping how islanders understood the stability and fragility of their communities.

2) Oil and gas & harbour modernisation (1970s – early 2000s)

The arrival of North Sea oil in the 1970s introduced significant cultural and social change for Orkney. From the outset, oil was framed as a potential threat to Orcadian heritage, with warnings that economic expansion might "obliterate the historical character" of local burghs and "submerge the Orcadian identity",[278] generating what some described as "cultural incongruities and collisions".[279]

This sense of vulnerability was reinforced by constitutional debates. Nicolson notes that proposals to merge Orkney and Shetland into a Highlands and Islands regional council provoked strong reactions, with The Orcadian warning that "it is frightening to think that these islands, with their traditionally Norse-based culture and outlook, would be controlled by members from a predominantly Gaelic area".[280] These debates highlight how energy development intersected with anxieties about cultural incompatibility and governance.

[273] Towsey (n 246); Maclean (n 203).

[274] Daniel Francis, *A History of World Whaling* (Viking 1990).

[275] Struthers (n 197).

[276] JR Coull, 'The Economic Development of the Island of Westray, Orkney' (1966) 82 Scottish Geographical Magazine 154 https://doi.org/10.1080/00369226608736018.

[277] Maclean (n 203).

[278] Susan Luther-Davies, 'The Urban and Historical Geography of Kirkwall and Stromness, Orkney' (PhD Thesis - University of Glasgow 1974).

[279] Terry Brotherstone and Hugo Manson, 'North Sea Oil, Its Narratives and Its History: An Archive of Oral Documentation and the Making of Contemporary Britain' (2007) 27 (First Series) Northern Scotland 15.

[280] Nicolson (n 68).

Concerns about cultural erosions also extended to language, particularly the Orcadian dialect, and everyday social practices. Campbell describes concern of linguistic marginalisation, [281] while Howell notes that depopulation and social fragmentation were perceived as "debilitating", eroding traditions and shared practices and that "people were closer together at that time and got on better, dependent on each other... People are more independent now". [282] The arrival of transient workforces associated with the oil industry, while reversed depopulation and boosted incomes, also deepened social divisions and eroded traditional identities with its "hire-and-fire, cowboy mentality", [283] raising questions about the cultural costs of industrialisation Sinclair notes that within the large Irish workforce that arrived during the construction of the Flotta terminal, there were clear cultural differences and divides, with those men from the Republic more culturally and socially aligned with Orcadians, while those from the North struggled to integrate as well. [284] These accounts suggest that oil development accelerated cultural shifts, amplifying fears of cultural loss and weakening the social fabric that had previously sustained island life.

Demographic pressures during this period were significant, and as previously discussed (section 4.3.2), Orkney's population grew quickly reversing decades of decline [285] while creating housing shortages and infrastructure pressures. [286] Construction of the Flotta terminal brought large numbers of incomers. Forsythe notes that incomer migration, rather than oil employment, was often the most visible source of social change, reshaping everyday life and contributing to tensions. [287] Reports of crime waves and resentment toward incoming workers further illustrate strains on social relations. [288]

3) *Renewable energy and diversification (2000s – present)*

Marine renewables have reframed Orkney's identity around innovation and sustainability. The establishment of EMEC in 2003 positioned the islands as a global testbed for wave and tidal technologies, creating narratives of pride in technical leadership and branding Orkney as "energy islands". [289]

Community cohesion in this era is shaped by local ownership models and contested notions of "community". The UK government has highlighted the beneficial impacts of community renewables not only for economic regeneration and achieving net-zero, but for social cohesion and acceptance. [290] Development trusts reinvest turbine revenues in housing, transport, and social infrastructure, strengthening local agency and self-sufficiency narratives. [291]

[281] Campbell (n 180).

[282] Howell (n 260).

[283] David Newlands and Alexandra Brehme, 'A Historiography of the Impact of North Sea Oil on Northern Scotland' (2007) 27 (First Series) Northern Scotland 81.

[284] Sinclair (n 214).

[285] Nicolson (n 68).

[286] Lapsley (n 187).

[287] Diana Forsythe, *Urban-Rural Migration, Change and Conflict in an Orkney Island Community* (Social Science Research Council 1982).

[288] Nicolson (n 68).

[289] McGeoch and others (n 258); Atkins (n 258); Watts (n 189).

[290] Okkonen and Lehtonen (n 190).

[291] Watts (n 189); Westrom (n 232).

However, these arrangements are not without tension. Watts notes that even defining a 'community wind turbine' "is not a given or uncontested thing".[292] Westrom similarly notes perceptions of trusts as "cliquey", even if they enable services such as out-of-hours ferries and hydrogen heating for schools.[293] These dynamics illustrate how empowerment can coexist with exclusivity, shaping cohesion in complex ways.

Cultural and visual impacts of energy infrastructure, closely tied to narratives of place and identity,[294] further complicate how renewables are perceived in Orkney. Archaeological and visual assessments frame renewables as both opportunity and threat to Orkney's cultural identity.[295] Concerns over landscape change and potential jeopardy to World Heritage status have surfaced in planning debates.[296] Participation challenges persist and while strong bonding social capital among fishers supports resilience, low trust in authorities and barriers to engaging in marine spatial planning limit linking capital and influence.[297] These dynamics highlight that transitions are not only technical but social, reshaping how communities envisage sense of place and its future.

4.4. Conclusions – marine energy transitions and justice in Orkney

Orkney's experience of successive METs illustrates the complexity of balancing economic opportunities, governance, and cultural continuity in a small island context. Across three centuries Orkney's marine economy went through three overlapping phases, traditional (shipping, fisheries, kelp); oil and gas; and marine renewable energy. These transitions reveal recurring justice challenges, patterns of power and wealth distribution remain uneven, shaped by external market forces and centralised decision-making. While each transition introduced new forms of prosperity, these gains were often short-lived and accompanied by social disruption.

Feudal governance entrenched inequality, with wealth concentrated among lairds and tenants left vulnerable. The oil boom of the 1970s marked a turning point, enabling Orkney to secure unprecedented legislative powers and revenue-sharing mechanisms. Yet, despite these innovations, meaningful participation remained limited, and benefits were unevenly distributed between communities. Similar dynamics persist in the current renewables phase of the marine economy, where Orkney is celebrated as a global leader in marine innovation but faces persistent vulnerabilities, including fuel poverty, short-term employment, and limited local influence over offshore planning. Community-led initiatives provide some empowerment and local agency, but their success depends on policy support and infrastructure access.

These patterns underscore that energy transitions are not only technical but deeply social. They reshape the narratives of place, identity, and justice, raising questions about who benefits and who bears the burdens of transition and how fairness is understood locally. As Orkney navigates future energy pathways, lessons from past transitions highlight the need for governance frameworks that embed participation, cultural recognition and distributive justice at their core.

[292] Watts (n 189).

[293] Westrom (n 232).

[294] Jiska de Groot and Ian Bailey, 'What Drives Attitudes towards Marine Renewable Energy Development in Island Communities in the UK?' (2016) 13 International Journal of Marine Energy 80 https://doi.org/10.1016/j.ijome.2016.01.007; John Cumming, Fiona Cumming and Morag MacInnes, *Working the Map: Islanders and a Changing Environment* (Hansel Cooperative Press 2015).

[295] Daniel Lee and Richard Irvine, 'Orkney Energy Landscapes' (2022) 7 Orkney Archaeology Review 37.

[296] Davey (n 151).

[297] Yannick W. Bakker, de Koning and van Tatenhove (n 221).

5. From Oil Capital to Energy Hub: Just Transitions in the North East of Scotland

5. From Oil Capital to Energy Hub: Just Transitions in the North East of Scotland

5.1. Background

There is no clear historically consistent definition of the 'North East of Scotland' region.[298] Since the 1970s, regional planning typically grouped Aberdeen with Aberdeenshire and, at times, extended to include Moray under the broader Grampian designation.[299] The current Scottish Government National Planning Framework, does not provide a clear limit to the 'North East' region, appearing to include areas in Aberdeen, Aberdeenshire, and Moray.[300] From a MET perspective, this regional approach showcases the interaction between maritime economy, coastal communities, and wider region hosting affiliated and other industries.

The North East of Scotland's coastal economy has been repeatedly reorganised around the sea. Maritime economy in the region shifted from early fisheries, curing and coastal trade to 19th century shipbuilding and whaling, to the 1970s oil era centred on Aberdeen and Peterhead, and to the current pivot toward offshore wind, hydrogen and decommissioning.

These transitions have redistributed power, income, and influence between central government, external firms, local authorities, and coastal communities.

Historic evidence on fisheries and harbours shows how governance arrangements, external factors, and capital intensity concentrated activity in larger ports, most notably Aberdeen, while smaller harbours, struggled to match the pace of technological change and market integration.[301] Local histories also document the social organisation and gendered division of labour in fishing communities across Buchan and the Moray Firth, where kinship, religious practice, and seasonal mobility underpinned resilience in the face of recurring shocks.[302]

A major break occurred with the advent of the North Sea oil and gas industry from the early 1970s. Aberdeen rapidly became the hub for technical and administrative services for the industry, bringing a number of socio-economic disruptions, from sharp employment growth, migration in-flows, infrastructure expansion, and housing market upheaval.[303]

[298] David Clelland, 'Beyond the City Region? Uneven Governance and the Evolution of Regional Economic Development in Scotland' (2020) 35 Local Economy 7 https://doi.org/10.1177/0269094219899917 [added source].

[299] Shapovalova and others (n 167).

[300] Scottish Government, 'National Planning Framework 4' (2023) <https://www.gov.scot/publications/national-planning-framework-4/> Accessed 8 December 2025 [added source].

[301] Kathryn L Moore, 'The Northeast of Scotland's Coastal Trading Links Towards the End of the Nineteenth Century Evidence from the Daybook of Three Ports: Aberdeen, Peterhead and Gardenstown' (2001) 21 Scottish Economic & Social History 95 https://doi.org/10.3366/jshs.2001.21.2.95; David W Summers, *Fishing off the Knuckle* (Centre for Scottish Studies, University of Aberdeen 1988); JJ Waterman, *Aberdeen and the Fishing Industry in the Eighteen Seventies.* (Centre for Scottish Studies, University of Aberdeen 1981).

[302] Summers (n 301); Lorna Mary Watson, 'Change and Continuity in a Coastal Habitus' (PhD Thesis - Aberdeen University 2024); Maclean (n 203); JR Coull, 'Fisheries in the North East of Scotland before 1800' (1969) 13 Scottish Studies.

[303] Shapovalova and others (n 5); Deirdre Hunt, 'Responses of Industry within Aberdeen to Oil Related Change: Some Implications for Urban Planners' (1976) 9 International Journal of Environmental Studies 269; John Hutton, *Impacts of Offshore Oil on North East Scotland* (Massachusetts Institute of Technology 1975); Moir (n 71); C Jones and D Maclennan, 'Urban Growth and Housing-Market Change: Aberdeen 1968 to 1978' (1991) 23 Environment and Planning A: Economy and Space 571 https://doi.org/10.1068/a230571.

At the same time, governance of the oil and gas industry remained largely centralised and market-led, with local authorities in a facilitative rather than directive role. The costs and burdens of the growing oil industry, including the displacement of traditional businesses, uneven access to income and benefits, were distributed unevenly across places and groups. [304]

The oil industry has undergone a number of price slumps, each bringing socio-economic disruptions to the region's employment, housing market, and community sense of security. Production peaked in 1999 and has been in steady decline since, exacerbated by an oil price slump of 2014-2015. [305]

Since the 2010s, offshore wind and hydrogen demonstration projects have reframed the region's energy narrative from "oil capital" to "energy capital" with leadership in decarbonisation. The first two wind turbines in the UK were installed in the year 2000, and by 2022, there were 3,197 turbines operating or under construction in UK waters, providing 45% of the European offshore wind energy capacity and 24% of global capacity. [306]

The new offshore energy industries raise procedural and distributive justice questions, particularly around workforce transition, coexistence with other maritime industries (such as fisheries), local content and manufacturing, and community benefits. [307]

[304] AH Harris and others, 'Who Gains from Structural Change? The Distribution of the Benefits of Oil in Aberdeen' (1986) 23 Urban Studies 271 https://doi.org/10.1080/00420988620080341 [added source]; William Mackie, 'The Impact of North Sea Oil on the North East of Scotland, 1969-2000: A Historical Analysis.' (PhD Thesis - University of Aberdeen 2001); Aberdeen City Council and Aberdeenshire Council, 'Oil and the North East: The Developing Impact' (City Council 1997).

[305] Muhammad Imran Khan and others, '2014 Oil Plunge: Causes and Impacts on Renewable Energy' (2017) 68 Renewable and Sustainable Energy Reviews 609 https://doi.org/10.1016/j.rser.2016.10.026 [added source].

[306] CL Szostek and others, 'Spatial Conflict in Offshore Wind Farms: Challenges and Solutions for the Commercial Fishing Industry' (2025) 200 Energy Policy 114555 https://doi.org/10.1016/j.enpol.2025.114555.

[307] Glasson (n 230); John Glasson and others, 'The Local Socio-Economic Impacts of Offshore Wind Farms' (2022) 95 Environmental Impact Assessment Review 106783 https://doi.org/10.1016/j.eiar.2022.106783; Xodus, 'Assessing Fisheries Displacement by Other Licensed Marine Activities: Good Practice Guidance - Literature Review' (Scottish Government) <https://www.gov.scot/publications/good-practice-guidance-assessing-fisheries-displacement-licensed-marine-activities-literature-review/> Accessed 18 December 2025; Claire Twigger-Ross and others, 'Offshore Renewables - Social Impact: Two Way Conversation with the People of Scotland' (Scottish Government 2022) <https://www.gov.scot/publications/two-way-conversation-people-scotland-social-impact-offshore-renewables/> Accessed 18 December 2025.

Marine economy transitions in the North East of Scotland can thus be considered through three broad and overlapping transition phases:

1) an early period dominated by fisheries and shipping (18th century – 1970s);

2) the rise of the oil and gas industry (1970s-2000s); and

3) the concurrent decline in the oil and gas production and rise in offshore renewables and other related industries (2000s-today).

This temporal framing provides a basis for examining how governance, work, identity, and resource access have evolved across successive METs.

5.2. Results overview for the North East

After two screening phases, 47 sources of evidence were included in the North East database. Most of the evidence comes from academic sources – a mix of articles, books, reports, and PhD theses (*n* = 34). There were also books presenting historic and personal accounts (*n* = 5), local and regional authority reports (*n* = 4), as well as government/ consultancy/industry reports (*n* = 4).

The geographical focus is dominated by Aberdeen/Aberdeenshire (particularly for oil and gas), Peterhead, and Fraserburgh (for whaling and fisheries). This profile parallels the transition sequence from fisheries to oil and now to renewables.

Publication dates range from 1815 to 2025, clustering around the oil arrival and expansion decades (1970-2020, *n* = 34).

5.3. Marine energy transitions in North East Scotland

This section explores how governance, economic structures, and community identity evolved across three phases of MET in the North East of Scotland. Governance shapes how power and wealth are distributed in marine industries, and how decisions are made. The economic and workforce section provides qualitative and quantitative account of the impacts of METs in the North East. Finally, community identity and social cohesion reflect how the METs reshape the cultural fabric and social relations. Throughout the section, the previously defined ideas of justice underpin the analysis of the identified sources.

5.3.1. Governance, authority, and wealth distribution

1) Fisheries and shipping hub (18th century – 1970s)

In the period when the maritime economy of the North East of Scotland was based on whaling, fisheries, and shipping, governance rested with burgh authorities, harbour boards, and coastal lairds. Marine economy transitions were shaped by technological progress (steam power, larger vessels), infrastructure centralisation, resource depletion, and external shocks (wars, market collapses), leaving coastal communities vulnerable to fluctuations.

Early governance combined feudal control, church support, and later state incentives. In the pre-industrial period, fishing communities were embedded in estate structures. Initially, fishing was embedded within feudal systems, where coastal estates controlled access and resources. It is reported that "in the rise of the fisheries, the lairds of coastal estates were the prime movers as organisers and entrepreneurs".[308] Fishermen often depended on landlords for capital and tenure as "the boats were usually supplied by the lairds... a usual system was that the fisherman paid a single rent for his shared boat, and his house and yard... and the laird undertook to replace the boat every seven years".[309]

[308] Coull (n 302).

[309] ibid.

The Church and the government provided some support to the fishing communities. For example, in cathedral towns, like Arbroath, "the monks encouraged full time fishing by buying the entire catch and distributing it to the poor, and also by supporting fisher folk during lean season".[310] The government offered bounties to build naval capacity and stimulate the whaling industry. In 1732, the British Government "had instituted a system of bounties in order to encourage whaling and thereby create a pool of trained seamen for the Royal Navy".[311] Government bounties were credited with facilitating the establishment of the Aberdeen Whaling Company in 1783.[312]

Local harbour boards and burgh trustees led decisions on infrastructure and services driven by market demands.[313] This regulatory discretion on harbour improvements and dues often prioritised larger ports with deeper capital pools and growing inland connections, through railways and motor vehicle.[314] The adoption of steam power and larger decked boats thus concentrated activity in major ports, such as Aberdeen and Peterhead.

Resource depletion and overfishing compounded these pressures, setting the stage for vulnerability when oil development began in the 1970s. Stock depletion was one of the central factors shaping both the whaling and the fishing industries, demonstrating early procedural contestation over access and conservation.[315]

With the decline in fishing and the overall North East economy in the run up to the 1970s,[316] the local authorities in the region established the North East Scotland Development Authority (NESDA).[317] Set up in May 1970, NESDA covered the City of Aberdeen, and the Counties of Aberdeen, Banff, Kincardine, Moray and Nairn, to address issues such as economic inactivity, high rate of unemployment, outmigration, industrial decline, and low wages.[318]

2) Oil and gas capital (1970s-2000s)

The governance of North Sea oil development in the UK was shaped by a strong national imperative to ramp up the production to maximise revenues and achieve energy security, coupled with, at least initially, largely laissez-faire approach offshore.[319]

[310] Maclean (n 203).

[311] WRH Duncan, 'Aberdeen and the Early Development of the Whaling Industry, 1750–1800' (1977) 3 Northern Scotland 47. See also Gavin Sutherland, *The Whaling Years: Peterhead 1788-1893* (University of Aberdeen Centre for Scottish Studies 1993); Alex R Buchan, *Fishing Out of Peterhead* (Aberdeen and Northeast Scotland Family History Society 1986).

[312] Robert Smith, *The Whale Hunters* (John Donald 1993).

[313] Moore (n 301).

[314] Kathryn L Moore, 'Developments in Trade and Marine Transport Facilities in the Northeast of Scotland 1600-1914: A Study in Historical Geography' (PhD Thesis, PhD Thesis - University of Aberdeen 1998 Moore (n 301); Thomas Donnelly, 'Shipbuilding in Aberdeen, 1750–1914' (1981) 4 (First Series) Northern Scotland 23.

[315] Smith (n 312); Summers (n 301).

[316] See on Gaskin report in Newlands and Brehme (n 283).

[317] North East Scotland Development Authority, *North Sea: Offshore Activities of North East Scotland.* (North East Scotland Development Authority 1973).

[318] ibid; Shapovalova and others (n 5).

[319] Janet L Dobbie, 'Planning for Oil: The Impact of North Sea Oil Developments on the Planning Process in North East Scotland' (PhD Thesis - University of Glasgow 1973).

In terms of onshore impacts, there has not been systematic attempts to proactively address the planning of regional development, leaving local authorities to manage unprecedented infrastructure demands with limited resources and strategic capacity. [320]

The national economic considerations were the primary concern in the governance of the nascent industry in the late 1960s – early 1970s. Particularly compared to Norway or Canada, "the role of central government in Britain in offshore developments has been relatively passive". [321] This has resulted in the governance system that is, to this day, largely market-driven and does not require State ownership of stake in oil and gas developments. There is also no regional or national fund (like the Government Pension Fund in Norway) to support long-term considerations for when there is an industry downturn or decline.

Local authorities bore the brunt of onshore impacts, acting as providers of infrastructure. Newlands and Brehme noted that "local authorities in the North East played a key role in attracting oil to Aberdeen. They were willing and able to provide the necessary infrastructure and support to attract oil-related companies to the area and to keep them there". [322]

However, planning for onshore impacts was reactive and fragmented. Harris et al. noted that "local government in Aberdeen [...] failed to consider alternative policy proposals which would have substantially preserved the benefits of oil related developments while minimising the associated costs". [323] With the fast development of the oil and gas industry, there was "no attempt to prevent or delay developments while a local government strategy was formulated". [324]

Unlike in Shetland (through the Zetland County Council Act 1974) and Orkney (see section 4.3.1) the planning authorities in Aberdeen did not appear "to have considered seeking extra powers". [325] Instead, "private firms were permitted to dictate the pattern of events from the beginning" making it "all the more difficult for local government to gain control over the pace or direction of subsequent developments". [326] In fact, the regional assistance, previously provided to the economically stagnated North East region, has been removed due to low unemployment, despite the decline in the traditional and the overall number of industries in Aberdeen. [327]

While some central funding and support existed, this tended to be reactive and project-specific rather than focused on benefit redistribution in the longer term. For example, in the location of onshore developments, "the governmental hand was most evident in the issuing of advice notes and in the decisions on particular planning applications". [328]

[320] Tony Harris, *The Management of Change: Local Government and Oil in Aberdeen.* (Department of Political Economy University of Aberdeen 1984).

[321] Moir (n 71).

[322] Newlands and Brehme (n 283).

[323] Harris (n 320).

[324] ibid.

[325] ibid.

[326] ibid.

[327] Shapovalova and others (n 5).

[328] Moir (n 71).

It also provided some financial support "by helping to service its mounting oil-related debt through an annual oil-related grant" to the local authority, some £4.5 million in 1981/82.[329] However, the local spend had been increasing steeply, "by April 1982 the Regional Council's expenditure on 'oil related' projects will have reached £50 million".[330] Thus, although central funding helped keep pace with immediate demand on the services in the region, there was no durable regional development settlement for the North East of Scotland.

The governance of the North Sea oil and gas industry was thus nationally-driven, prioritising rapid extraction and energy security over long-term regional sustainability. While there were efforts to support local value-production and economic development, these were not long-term nor strategic, leaving the North East vulnerable to the eventual industry decline and boom-and-bust cycles.

3) Offshore energy and decarbonisation hub? (2000s – today)

Since the early 2000s, after the oil and gas production peaked, the governance of the energy sector in the North East of Scotland has been shaped by the twin challenges of managing oil and gas decline and steering a transition toward renewables. While national and regional actors have introduced new frameworks and funding streams, governance responses have often been fragmented, reactive, and uneven in addressing social and economic impacts of the changing industry.

The UK is a global leader in offshore wind energy generation, with both the UK and Scottish governments establishing policy goals for the expansion production and the resulting considerable increase in the areas of seabed available to lease.[331] The governance of the offshore renewables sector is somewhat more decentralised than oil and gas with the Scottish Government and Crown Estate Scotland having authority over offshore wind panning, authorisation, and leasing. Some aspects of offshore wind are still governed UK-wide, including energy market arrangements and Contracts for Difference, the UK's primary subsidy mechanism for offshore renewables.[332]

There are also important public-private partnerships providing institutional support to offshore renewables, such as the Offshore Wind Industry Council (OWIC), bringing together representatives of government, developers, and supply chain to contribute to building a competitive UK-based industry.[333] Programmes, such as the Offshore Renewable Energy (ORE) Catapult Centre and the National Renewables Infrastructure Fund (N-RIF) Scotland provide funding and support to the industry and the development of port and near port locations for the use of the offshore wind industry.[334]

At the same time, the regional impacts of the growing industry in the North East of Scotland remain unaddressed in the governance landscape, particularly when considered together with the impacts of declining oil and gas industry.

[329] ibid.

[330] Grampian Regional Council, 'Oil and Gas: Future Impact upon Grampian Region'.

[331] Xodus (n 307).

[332] John Glasson and others, 'Guidance on Assessing the Socio-Economic Impacts of Offshore Wind Farms (OWFs)' https://doi.org/10.24384/ax1s-jr48.

[333] ibid.

[334] ibid.

The short-termism and the lack of long-term planning by the central government failed to adequately prepare the North East region for economic downturns and the subsequent energy transition. [335] There are no concerted governance efforts to build and retain economic value for the growing industry in the region, with concerns that onshore impacts are not sufficiently considered in the process of planning and authorising marine renewables. [336]

Efforts to integrate climate and transition policy have also been slow and fragmented. For example, the North Sea Transition Authority only integrated climate change into its oil and gas strategy in 2021. [337] This delay meant that governance frameworks for a fair transition emerged late and unevenly. While the Scottish climate legislation integrates "just transition principles", there is no clear plan for the North East or the energy sector. At the UK level, "just transition" has not yet been integrated into the legal or policy frameworks despite some initiatives to support offshore workers.

Coexistence between offshore wind and commercial fisheries also remains a major governance challenge. Although "fishing is not legally excluded from within operational wind farms in the UK," it is often impractical due to "logistical, safety or liability reasons," making co-existence largely unacceptable under the current regulatory regime. [338] At the same time, "the increase in Marine Renewable Energy projects... and designated Marine Protected Areas" has intensified concerns about displacement of fishing activity. [339] These developments highlight the need for governance frameworks that balance marine spatial planning, stakeholder engagement, and conflict resolution to manage competing uses of sea space.

For a just transition in the North East of Scotland, there is a need to reconsider the governance model driven by external control and fragmented planning prioritising shorter-term industry development and energy security. These patterns underscore the need for proactive, place-based governance that balances economic, social, and environmental priorities.

From feudal lairds to central government during the oil boom, decision-making power rarely rested locally, leaving communities exposed to shocks. Mechanisms for wealth retention, such as sovereign funds, were absent, reinforcing vulnerability to boom-and-bust cycles. Today, despite progress in offshore renewables and just transition frameworks, governance remains uneven, with slow climate integration, limited regional benefit capture, and unresolved conflicts over marine space.

[335] Shapovalova and others (n 5).

[336] Glasson and others (n 307).

[337] Shapovalova and others (n 5).

[338] Szostek and others (n 306).

[339] Xodus (n 307).

5.3.2. Economic and workforce transitions

1) Fisheries and shipping hub (18th century – 1970s)

The maritime economy in the North East of Scotland during the fisheries and shipping phase was deeply rooted in coastal trade. Coastal shipping enabled the export of goods and the import of raw materials providing "both employment and a means of investment for those living in the area".[340] Ports along the coast served as anchors supporting ancillary industries, such as shipbuilding, chandlery, rope/sail making, coopers.[341]

Fishing itself was organised on a family basis, with women and children playing integral roles in the daily operations: "the work of baiting the lines... was the work of the women, helped by the children".[342] The fish-wife economy and barter systems further underpinned local subsistence and market circulation, creating a distinctive socio-economic fabric in coastal communities.[343]

The uncertainty in the fisheries and whaling industry meant that the periods of prosperity were interrupted with the years plagued with poor performance. For example, while "Aberdeen's whaling industry was profitable in the early 1800s, but high risks led to its decline by 1830".[344] Whaling was "dangerous and chancy",[345] driving merchants to diversify into safer ventures.

Maritime industries were a substantial source of employment in coastal regions: for example "Peterhead ships... crewed by over 1,000 seamen"; herring fishing employed thousands of men at sea.[346] At the same time, there was considerable risk associated with maritime jobs: "twelve Aberdeen whalers were lost between 1813 and 1840 and out of a total of twenty ships whaling from the port between 1800 and 1840 no less than 60 per cent were lost".[347] Many Peterhead ships were lost at sea during whaling and fishing activities.[348] This precarity had impacts both on the local economy and the livelihoods of the coastal communities.

Technological change and development of land-based transport contributed to concentration of maritime activities in the bigger posts, such as Aberdeen and Peterhead.[349] As more steam powered ships and larger decker boats were used, smaller harbours saw their dues remain steady or decline gradually in the second half of the 19th century.[350] This early consolidation foreshadowed later corporate control of the fishery, marking a shift away from traditional, community-based operations toward more capital-intensive and centralised models.

[340] Moore (n 301).
[341] ibid.
[342] Coull (n 302).
[343] ibid.
[344] Duncan (n 311).
[345] Smith (n 312).
[346] Buchan (n 311).
[347] Smith (n 312).
[348] Sutherland (n 311); Buchan (n 311).
[349] Maclean (n 203); Moore (n 301).
[350] Moore (n 314).

2) Oil and gas capital (1970s-2000s)

The discovery of North Sea oil transformed the North East of Scotland into a global energy hub, reshaping its economy and demographics. After years of high unemployment in the run up to the oil discovery, the arrival of the new industry caused a boom - employment surged dramatically, with "over 34,000 new jobs... between 1971 and 1978".[351] Oil-related employment peaked in mid-1991 at just over 54,000 jobs.[352]

The arrival of the oil industry reversed decades of economic stagnation, lifting average male earnings "from 15% less than the British average in 1971 to 10% above this average in 1981", while female earnings rose above the British average.[353] The outmigration trends were reversed – between early 1970s and 1996 "population has increased by some 15% (...) largely as a result of net migration".[354]

With this economic rise came dependencies – with 28-40% of local employment becoming oil-related.[355] There were also impacts on the traditional industries, which faced severe pressures from rising property costs, labour poaching, and the loss of Development Area Status for the region.[356] As one study noted, "for every 100 jobs created by oil, 8 are lost in the non-oil sector".[357]

It is reported that these effects have been most felt in "fishing, non-oil related construction, and manufacturing".[358] Between 1977 and 1981, Aberdeen "lost a quarter of its jobs in food processing and a fifth of its engineering, shipbuilding and textiles jobs".[359] Fisheries remain a major sector in places like Peterhead, where the sector still has significant direct employment. Despite some decommissioning and a 40% reduction in the fleet size, Peterhead remained a major fishing community, landing 29% of total fish landings in Scotland (by weight) in 2001.[360]

This structural vulnerability was compounded by the absence of long-term planning or mechanisms to retain wealth locally. The expansion of the oil and gas industry, characterised by a high degree of external control, combined with the decline of Aberdeen's traditional industries, has altered the patterns of ownership. It is reported that "in little more than ten years the situation in which the majority of industry in the City was locally owned and controlled has been completely reversed".[361]

The oil boom also reshaped the built environment and housing market.[362] Before 1970, house prices in Aberdeen were relatively stable but after the oil boom, they rose rapidly, "increasing five-fold between 1970 and 1978".[363]

[351] Moir (n 71).

[352] Aberdeen City Council and Aberdeenshire Council (n 304).

[353] Grampian Regional Council (n 330).

[354] Aberdeen City Council and Aberdeenshire Council (n 304); Mackie (n 304).

[355] T Harris and others, 'Oil and the Aberdeen Economy: Structural Change and the Response of the State.' [1986] Global Restructuring Local Response 49.

[356] Aberdeen City Council and Aberdeenshire Council (n 303); Shapovalova and others (n 5).

[357] Harris and others (n 355).

[358] Harris (n 320).

[359] ibid.

[360] Brookfield, Gray and Hatchard (n 84).

[361] Harris (n 320).

[362] Hunt (n 303); Jones and Maclennan (n 303); Shapovalova and others (n 5).

[363] Jones and Maclennan (n 303).

House-building output surged by "more than 250% between 1973 and 1975" but supply constraints and tenure structure meant rising demand was only partially absorbed, leaving "further difficulties for those still requiring rented housing".[364] This increased demand on housing meant that most houses in mid-1980s "were nearly 50% more expensive in Aberdeen than the national average".[365]

Infrastructure expanded rapidly, with major harbour upgrades, new roads, and the airport at Dyce becoming "the largest commercial heliport in Europe".[366] Despite the improvements, local services often struggled under pressure from rapid growth.[367]

From the distributional perspective, the impacts of the oil and gas industry booms and busts were significant. Gains were uneven: "men benefited more than women from oil and middle-class people more than working-class people".[368] Throughout the industry fluctuations, many communities in the region experienced job insecurity, gender inequality, and income inequality.[369]

A "dependency culture" emerged, "unwilling to recognise the... finite nature" of oil wealth, while companies made "no tangible financial contribution to alleviate the effects of that uncertainty".[370] These dynamics left the region vulnerable to future downturns, despite its temporary prosperity.

3) *Offshore energy and decarbonisation hub? (2000s – today)*

The North East of Scotland is entering a new chapter as offshore wind emerges as a cornerstone of the UK's energy transition. The UK and Scottish governments have expanded seabed leasing, driving rapid sector growth. Employment in offshore wind has risen significantly with "17,000 in 2023," while forecasts suggest "88,509 jobs are required by 2026".[371] Despite this international advantage, concerns remain that "the UK offshore wind sector has not sufficiently capitalised on its lead to secure UK economic advantage... in terms of UK investment and UK jobs".[372]

There is significant expectation that the offshore renewables sector, and other industries (such as CCUS and hydrogen) should provide a sufficient substitute for the dwindling oil and gas jobs, but the workforce transition remains challenging, and the pace of demand in the wider energy sector is not matching the pace of decline in oil and gas.[373]

Local content requirements and implementation remain uneven.[374] While "onshore construction and O&M [operation and maintenance] performed better... in terms of local employment content", much offshore construction is outsourced.[375]

[364] ibid.
[365] Harris (n 320).
[366] Moir (n 71).
[367] Grampian Regional Council (n 330).
[368] Newlands and Brehme (n 283).
[369] Shapovalova and others (n 5).
[370] Mackie (n 304).
[371] Szostek and others (n 306).
[372] Glasson and others (n 332).
[373] Shapovalova and others (n 30).
[374] Shapovalova and others (n 5).
[375] Glasson and others (n 307).

Only *around* "30% of capital expenditure (CAPEX) stays in the UK", compared to around "75% of operational and maintenance expenditure (OPEX)", which is estimated to support thousands of jobs.[376] These figures highlight the importance of port infrastructure and supply chain hubs for capturing regional benefits. As Glasson et al. note, "the availability of a hub port, with modern facilities for large-scale rigs and set down areas is very important for developing major supply chain economic benefits".[377]

Workforce transition remains challenging. Oil is now mature and provides fewer jobs, with offshore employment increasingly in decommissioning rather than new developments.[378] Many workers face "persistent economic insecurity" due to "lack of transferable qualifications and unclear training pathways". Without targeted reskilling, the region risks repeating past patterns of dependency and vulnerability.

As noted above, coexistence with fisheries adds further complexity. Fishers report negative experiences of the impacts of existing and proposed offshore wind developments, including financial implications, displacement, and competition for grounds, compounded by the expansion of Marine Protected Areas and No-Take Zones.[379] In 2021, the UK fishing fleet comprised "4,269 active vessels... with 6,835 employed fishermen" and a turnover of "£802 million", underscoring the economic stakes of spatial conflicts.[380]

Despite strong national targets and investment, governance gaps persist. Research highlights a "clear focus on economic impacts... very little coverage of the OWF [offshore wind farms] onshore element, and of social impacts".[381] Monitoring of local outcomes remains limited, and "major economic leakage from the UK economy"[382] continues, particularly during the construction phase. While offshore wind offers transformative potential, "gross value added (GVA) to the UK per GW installed... estimated at £1.8bn",[383] realising a just transition will require stronger mechanisms to retain value locally, address coexistence conflicts, and integrate social impact assessment into planning.

5.3.3. Community identity and social cohesion

1) Fisheries and shipping hub (18th century – 1970s)

Community identity in the North East of Scotland evolved alongside marine transitions, reflecting changes in work organisation, gender roles, and cultural norms. Fishing coastal communities were deeply embedded in kinship networks and seasonal rhythms, with a pronounced gendered division of labour.[384] As Watson notes, "during the fishing era, a pronounced sex-based division of labour decreed that fishing was conducted exclusively by men, and onshore fish processing was handled by the women of the village".[385] Seasonal rhythms shaped everyday life: "school roll in the Aberdeenshire parish of Slains fell

[376] ibid.
[377] ibid.
[378] Newlands and Brehme (n 283).
[379] Szostek and others (n 306).
[380] ibid.
[381] Glasson and others (n 307).
[382] ibid.
[383] Szostek and others (n 306).
[384] Watson (n 302); Coull (n 302).
[385] Watson (n 302).

markedly in summer at the end of the eighteenth century, when everyone over six or seven years old in the villages of Collieston and Old Castle was fully occupied in baiting".[386]

Technological progress altered these patterns as the "increasing use of large decked boats, as opposed to small boats which could be drawn up on the shore daily, gradually pulled the fishers into the ports", concentrating activity in towns such as Fraserbugh and Peterhead.[387] Smaller harbours, like Boddam, faced decline: "the harbour effectively put a ceiling on the size of craft which a Boddam fisherman could own... while fishermen in other villages were investing heavily in larger boats".[388] The use of larger boats also changed the fisheries "from the traditional family operation into large commercial concerns operating to scale economies...increasingly detached from local communities".[389] These changes foreshadowed the erosion of traditional autonomy and the onset of more capital-intensive models.

Although activities in smaller ports of the region steady or declined gradually in the second half of the 19th century, "some continued to play a part within their local economies into the early decades of the following century and, very occasionally, beyond".[390] Ports were vibrant social and economic hubs: "harbours buzzed with activity... traders and tradesmen of every sort reaped the rewards".[391]

Communities were built around maritime infrastructure - ports served as economic hubs, and small harbours provided essential services and supplies to their communities (e.g., Gardenstown, Pennan).[392] Fish was regularly exchanged for essential produce such as meal, butter, cheese and eggs. The local trade was generally the responsibility of the fish-wife, "a well-known figure in traditional Scottish life".[393] Town identity was anchored in the sector, "the town [of Peterhead] might well be described as 'fishing town'."[394]

The maritime legacy thus played the crucial role in the community identities of the coastal populations in the North East of Scotland. Despite the precarity, and the eventual decline, many communities today are defined by their maritime past and present.

2) Oil and gas capital (1970s-2000s)

The oil boom in the 1970s disrupted the established social structures in the region, introducing rapid urbanisation, housing pressures, and demographic change through in-migration. As discussed above, despite the positive economic developments, rising housing prices and infrastructure strain deepened the existing inequalities. Displacement of some communities to give way to oil infrastructure, such as clearance of Old Torry, had an impact on community ties and cohesion.[395]

[386] Coull (n 302).
[387] Summers (n 301).
[388] ibid.
[389] Brookfield, Gray and Hatchard (n 84).
[390] Moore (n 301).
[391] Sutherland (n 311).
[392] Summers (n 301).
[393] Coull (n 302).
[394] Summers (n 301).
[395] Dobbie (n 319).

Declining fishing activity was compounded with limited diversification opportunities due to remoteness, economic vulnerability, fleet reduction, ownership changes from family operations to large companies.[396] Where "once upon a time households...organised their lives around the daily demands of preparing boats, gear and supplies for sea, most now have at least one member relying on wage work in towns, factories or oil rigs".[397] Tensions emerged between oil and fishing sectors over gear damage and restricted grounds.[398] The monetary losses of the fishing industry were estimates at "a minimum of £50,000 and a maximum of £430,000-£460,000 in 1976 prices".[399]

Gender roles shifted "with the decline of the fishing industry and the simultaneous emergence of the energy industry", and the "inevitable transition...had a greater impact upon women's as opposed to men's lives".[400] While many men secured offshore employment, women's traditional roles in the maritime economy disappeared, creating cultural dislocation. Despite the improvement in wealth amongst the skilled worker class, this has not translated to equal distribution of wealth across the social classes in the region, and indeed, the improved situation in earnings was very much a gendered success story, with little improvement in women's earnings during the same period.[401] The distribution of benefits was uneven across the region - "while the unemployment rate in Aberdeen as a whole in July 1984 was 7.2%, the unemployment rates in Woodside, Powis, and Northfield were all above 10%".[402]

Despite the obvious benefits of more jobs and higher average wages, the impact on the communities across the North East was visible. Moore noted that "there have been changes in Peterhead since 1970, increased teenage drinking, marital breakdown, higher house prices and larger wages...some of the effects of oil have been indirect, and possible hidden."[403]

As the oil price fluctuated with crashes in the 1980s, 1990s, and later, in 2014-2015, the impacts of the lack of long-term planning on both the economy and social cohesion of the region became clear.[404] A further consideration is the lack of local participation in decision-making about the energy sector, so closely tied to the economic and social life of the region. Hunt notes "considerable changes in decision-making locations have occurred [in the early 70s], with major investment and planning decisions being increasingly taken not only outside Aberdeen but outside the United Kingdom".[405] As discussed above (section 3.6 and 5.3.1), this challenge persists today as the future of the oil and gas industry is heavily debated in the UK national politics with continuously shifting views across political parties, but lack of local considerations contributing to the decisions on the future of the industry, and the pace and the format of the transition.

[396] Stead (n 50).

[397] ibid.

[398] TF Sprott, 'The Impact of North Sea Oil on the Grampian Region and Aberdeen (UK)' in WJ Cairns and PM Rogers (eds), *Onshore Impacts of Offshore Oil* (Applied Science Publishers 1981).

[399] GA Mackay and DW Pearce, 'Oil and Fishing — Conflict in the North Sea' (1978) 2 Marine Policy 333 https://doi.org/10.1016/0308-597x(78)90023-4.

[400] Watson (n 302).

[401] Shapovalova and others (n 5).

[402] Harris and others (n 355).

[403] Robert Moore, *The Social Impact of Oil: The Case of Peterhead* (Routledge 1982).

[404] Shapovalova and others (n 5).

[405] Hunt (n 303).

3) *Offshore energy and decarbonisation hub? (2000s – today)*

The transition to offshore wind and other low-carbon industries offers opportunities for regeneration in the North East of Scotland, particularly in "employment and general wellbeing in often deprived, and sometimes quite remote, coastal communities, as part of a focus on a green energy transition".[406]

However, the expansion of the industry also presents new challenges for community cohesion. While there is "a growing recognition... of the importance of a social licence to operate from the community", integration of social and local considerations into impact assessments are limited.[407] Social impacts of offshore wind are widespread, including impacts on the demography, housing, other local services, and the quality of life of the host coastal area.[408] Some social issues – such as attitudes to change in seascape, way of life and implications for the marine environment are important but are qualitative and therefore more difficult to assess through formal processes.[409]

While renewables promise jobs and investment, concerns persist about displacement of fishing activity and financial hardship for fishers. Coexistence with fisheries remains contentious, as discussed above, with fishers criticising compensation processes and expressing frustration about the "amount of money received or inequity of payments between individuals or fleet sectors".[410] This could deepen mistrust between traditional and emerging industries.

Communities face ongoing uncertainty linked to employment precarity, housing pressures, and limited influence over transition planning. Gendered impacts endure, as the erosion of traditional roles intersects with insecure pathways in emerging sectors. As Watson concludes, "these resilient entrepreneurial people will once again need to adapt their way of life... as long as place, community and people maintain their usual cohesion, then the collective habitus will play its role by sustaining the locals".[411] Community relations may also be strained by income disparities between highly paid renewables workers and locals whose livelihoods remain static.[412]

The energy transition introduces new social dynamics and uncertainties. Communities prioritise "local jobs and community sustainability, especially keeping younger people and families in coastal communities".[413] However, these priorities are not reflected in the governance frameworks which remain fragmented and do not offer comprehensive regional just transition plans. Despite two decades of discussion, many socio-economic and ecological concerns remain unresolved: "little has been done to effectively address or mitigate impacts and concerns".[414]

[406] Glasson and others (n 307).
[407] Glasson and others (n 332).
[408] ibid.
[409] ibid.
[410] Szostek and others (n 306).
[411] Watson (n 302).
[412] Twigger-Ross and others (n 307).
[413] ibid.
[414] Szostek and others (n 306).

5.4. Conclusions – a just transition from an oil capital to an energy hub?

The North East of Scotland illustrates the complexities of METs in a macro-regional context. Governance has historically prioritised national imperatives over regional sustainability, from feudal control in fisheries to centralised, market-led oil governance, and fragmented renewable planning. Economic transformations have delivered periods of prosperity but entrenched structural vulnerabilities, with wealth capture concentrated externally and limited mechanisms for long-term benefit retention.

Community identity has been repeatedly reshaped by these transitions, from kinship-based fishing cultures to the socially disruptive oil boom and the uncertain renewables era. Across all three phases considered in this section, distributive and procedural justice concerns persist: uneven access to benefits, exposure to risks, and limited local influence over decision-making.

Achieving a just transition requires a shift toward proactive, place-based governance that integrates social and cultural dimensions alongside economic and environmental priorities. This would include strengthening participatory planning to embed community voices in transition strategies. Developing robust local content frameworks could help retain economic value and secure employment pathways for the changing workforce.

There are some positive developments in investment in reskilling and workforce support, but more action is needed on supporting community capacity to mitigate precarity and support adaptation to change. Finally, in terms of the expanding offshore renewables sector, implementing fair compensation and co-existence mechanisms could help address spatial conflicts and sustain trust.

6. Industrial Hub to Energy Estuary: Maritime Economy Transitions & Justice in the Humber Estuary

6. Industrial Hub to Energy Estuary: Maritime Economy Transitions & Justice in the Humber Estuary

6.1. Background

The Humber Estuary is one of the UK's most historically important maritime and industrial regions, with its development and redevelopment driven by successive waves of nationally significant marine-based economic activities. Early marine industries, including 18th and 19th century whaling based out of Hull, established the estuary as a centre of seafaring trade, resource exploitation, and port logistics. [415] As the industrial economy expanded, the Humber evolved into a major hub for fishing, shipping, refining, and chemicals manufacturing, with large ports at Hull, Grimsby, and Immingham central to regional employment and identity. [416]

Throughout the 20th century, the Humber region played a key role in the UK's fossil fuel economy. Large petrochemical facilities, oil refineries, and carbon-intensive manufacturing sites grew along the estuary, supported by extensive port infrastructure and international supply chains. [417] While such industries generated employment and revenue in the region, [418] this industrial dependency coupled with patterns of deprivation in communities across the Humber region, made communities highly sensitive to economic restructuring that accompanies METs.

In recent years, national strategies have repositioned the Humber as a central location for delivering the UK's decarbonisation ambitions. Described as the UK's "Energy Estuary", the region now hosts offshore wind assembly and servicing, hydrogen production, and CCUS infrastructure. [419]

The designation of the Humber Freeport and cluster initiatives reflects its centrality to delivering the national low-carbon industrial strategy.

The Humber's marine economy transitions can be understood as unfolding across three broad historical phases, each marking a distinct structure of its marine and industrial economy. Phase 1 encompasses the traditional and early industrial maritime economy up to the mid-20th century; Phase 2 reflects the emergence and subsequent restructuring of heavy industry, oil and gas in the post-war decades; and Phase 3 corresponds to the contemporary net zero transition, characterised by the growth of offshore wind, hydrogen, and CCUS. This framing provides a basis for analysing how governance arrangements, labour markets, community identities, and resource access have evolved across successive METs.

Although it has experienced successive transitions, the justice implications for Humber communities remain relatively unexplored. The research on past energy transitions have primarily focused on the economic impacts and technological innovation, with less attention paid to lived experienced by local communities, distribution of burdens and benefits, and articulation of fairness over time. By examining justice narratives associated with past METs in the Humber Estuary, this section aims to explore the expectations and vulnerabilities that shape community responses to current and future change.

[415] Gordon Jackson, *The Trade and Shipping of Eighteenth-Century Hull* (East Yorkshire Local History Society 1975) [added source].

[416] David Boswell, *The History of Grimsby's Fishing Industry* (Grimsby Borough Council 1976).

[417] WG East, 'The Port of Kingston-upon-Hull during the Industrial Revolution' (1931) Economica 190 https://doi.org/10.2307/2547923.

[418] Andrew Cumbers, 'North Sea Oil and Regional Economic Development: The Case of the North East of England' (1995) 27 Area 208 [added source].

[419] Diarmaid Clery and Clair Gough, 'Cluster Mapping Report: The Humber Industrial Cluster' (Tyndall Centre for Climate Change Research 2022).

6.2. Results overview for the Humber Estuary

The materials gathered for the Humber case study were fewer in number than for the other case studies, reflecting a broader under-representation of the region in academic and other published work.

Following first- and second-phase screening, 23 records were included in the database for evidence extraction. A further two were excluded during detailed review based on relevance. The final Humber Estuary database comprised 21 sources.

The majority of the reviewed materials were academic publications (*n* = 13), including peer-reviewed journal articles and academic books. Four of the sources reviewed were government and local authority reports, reflecting policy, planning and governance perspectives. The remaining sources were personal accounts and books, which reflect the lived experiences and local perspectives.

The publication dates of the Humber materials ranged from 1931 to 2023. Four sources were published before 1980, largely reflecting earlier historical accounts of coastal and industrial life in the region. Six sources were published between 1980 and 2000, a period that aligns with the exploration, expansion and subsequent restructuring of oil and gas activity across the wider North Sea. The largest group of materials (*n* = 11) were published from 2000 onwards, corresponding to the emerging net-zero, decarbonisation and renewable energy agendas that have shaped more recent analyses of energy transition in the Humber.

6.3. Marine energy transitions in the Humber Estuary region

This section explores how governance, economic structures, and community identity evolved across three phases of MET in the Humber region.

6.3.1. Governance and resource access

1) Traditional and early industrial maritime economy (18th century – 1940s)

Maritime economy governance in the Humber Estuary during the early industrial period was shaped by organisations with an interest in commercial expansion and trade promotion. The main priorities were focused on expanding port activity and trade, rather than local social or environmental concerns. For example, the Corporation of Hull, the governing body for the town of Kingston-Upon-Hull, promoted fishing through financial incentives, such as bounties and 'fish days', and efforts to attract trawlers from other ports.[420] Whaling in Hull was similarly shaped by national policy interventions, including 18th- and early-19th-century government bounties used to sustain domestic whaling fleets and bolster Hull's competitiveness against foreign operators.[421]

As commercial activity expanded and fishing practices intensified, governance decisions aimed at stimulating supply of fish into Hull had limited success.[422] However, these measures also attracted newcomers to the fishing grounds, disrupting local markets and "[tilting] the local balance of supply and demand to the disadvantage of the catcher", disadvantaging established catchers and fuelling resentment among established fishers, occasionally leading to disturbances.[423]

[420] East (n 417); RNW Robinson, 'The Fish Trade in the Pre-Railway Era: The Yorkshire Coast, 1780–1840' (1989) 25 Northern History 222 https://doi.org/10.1179/nhi.1989.25.1.222.

[421] East (n 417).

[422] Robinson (n 420).

[423] Robb Robinson and James R Coull, *A History of the Yorkshire Coast Fishing Industry* 1780-1914 (Hull University Press 1987).

When bounties were later abolished, this caused alarm among fishing communities already facing hardship, prompting petitions to Parliament that went unanswered. [424]

2) *Heavy industry and oil and gas (1950s – 1990s)*

Post-war governance of marine resources in the Humber Estuary shifted from nationally controlled systems toward increasingly internationalised frameworks. In the immediate post-war decades, British trawlers operated freely in distant-water grounds, and governance focused on maintaining this access as central to the industry's viability. [425]

The fishing dispute between Iceland and the UK of 1958-1976, usually referred to as the 'Cod Wars', had a profound impact on the Humber region. Iceland progressively extended its territorial limits, first to four nautical miles in 1956 and finally to 200 nautical miles in 1976, requiring other countries' fishing fleets to obtain Iceland's permission to operate there. This was to the disadvantage of Humber-based fishers, resulting in exclusion from traditional distant-water grounds. [426] Ekberg reports that the Humber fishing industry's "troubles really began in 1953 with the first Icelandic limit-line extension" and the problems for the industry became "acute when Iceland took its 200-mile limit in the early 1970s". [427]

These territorial changes marked a shift toward resource sovereignty, curtailing historic access rights for Humber fleets. The loss of distant-water grounds was not accompanied (at that time) by measures to mitigate impacts on local trawlermen. Trawler company owners received compensation from the UK Government, but there was no requirement that this be passed on to the trawlermen. [428]

The UK's entry into the European Economic Community (EEC) introduced a supranational layer of governance, creating a multi-scalar structure with EU institutions setting overarching rules, national governments implementing them, and local councils having minimal influence over decisions that ultimately impacted their economic base.

The EU Common Fisheries Policy (CFP) brought with it new governance challenges for the Humber region. Ekberg describes the CFP as "literally an unworkable one", noting that Britain "had to be content with around a third of our own North Sea resources". [429] These changes were framed as externally imposed, where "the EEC became the bogey and not without cause". [430] Governance decisions negotiated at EU and national levels reportedly left local actors with little influence over outcomes that reshaped their livelihoods. [431]

[424] ibid.

[425] Charles Ekberg, *Grimsby Fish the Story of the Port and the Decline and Fall of the Deep Water Industry* (Barraduca 1984); Rex Booth, Hull: The Fishing Years (Breedon 1999).

[426] Ekberg (n 425); Jo Byrne, 'After the Trawl: Memory and Afterlife in the Wake of Hull's Distant-Water Fishing Industry' (2015) 27 International Journal of Maritime History 816 https://doi.org/10.1177/0843871415610281; Booth (n 425).

[427] Ekberg (n 425).

[428] UK Parliament, 'Trawlermen (Compensation)' (Hansard, 8 March 1999) <https://hansard.parliament.uk/Commons/1999-03-08/debates/fef58538-04db-4ede-99f4-0f1a2bbb3369/Trawlermen(Compensation)highlight=pension> Accessed 18 December 2025 [added source].

[429] Ekberg (n 425).

[430] ibid.

[431] ibid.

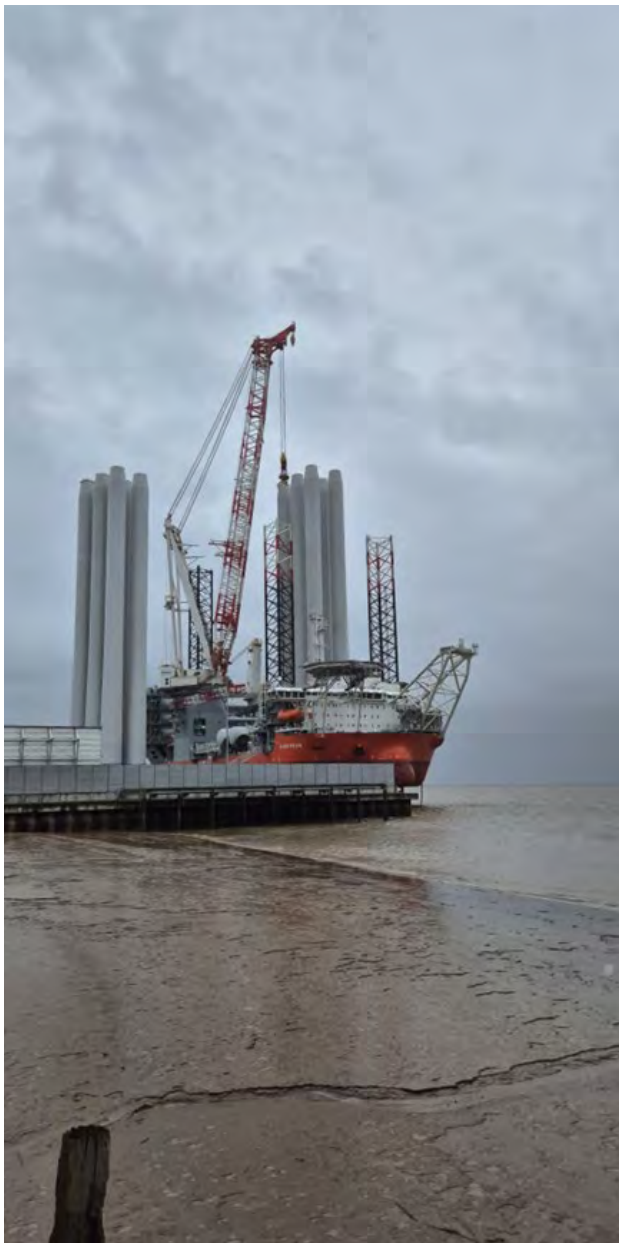


Photo Credit: Daryl Burdon Ltd.

It was not until the 1990s that specific financial instruments, such as the Financial Instrument for Fisheries Guidance (FIFG) and the European Fisheries Fund (EFF), were introduced to provide support and funding required for the sector to adapt to these supranational regulations.[432]

The discovery and exploitation of North Sea oil added further complexity to marine governance for the Humber region with parallel governance regimes under the UK Government control. While fishing communities faced restrictive quotas under the CFP,[433] petrochemical plants in Humberside benefited from new oil and gas pipelines.[434] Some vessels and crew were redeployed into North Sea oil support work,[435] but these shifts seemed to occur in an *ad hoc* manner. This indicates a lack of coordinated transition planning, with gains concentrated in emerging sectors while established industries declined.

3) *Net-zero transition: offshore wind, hydrogen, and CCUS (2000s – present)*

Contemporary governance in the Humber region is characterised by complex, multi-level arrangements involving national policy frameworks and reflecting the UK's commitment to decarbonisation and the emergence of offshore wind as a strategic industry. National climate legislation and policy, namely the Climate Change Act 2008, and the EU renewable energy targets (i.e., Renewable Energy Directive) introduced new governance frameworks for licensing and consenting offshore wind projects.[436]

[432] Council Regulation (EC) No 1198/2006 of 27 July 2006 on the European Fisheries Fund 2006 (OJ L); Council Regulation (EC) No 1263/1999 of 21 June 1999 on the Financial Instrument for Fisheries Guidance 1999 (OJ L).

[433] Ekberg (n 425).

[434] Frank W Geels, 'Conflicts between Economic and Low-Carbon Reorientation Processes: Insights from a Contextual Analysis of Evolving Company Strategies in the United Kingdom Petrochemical Industry (1970–2021)' (2022) 91 Energy Research & Social Science 102729 https://doi.org/10.1016/j.erss.2022.102729.

[435] Byrne (n 426).

[436] Caroline Hattam, Tara Hooper and Eleni Papathanasopoulou, 'A Well-Being Framework for Impact Evaluation: The Case of the UK Offshore Wind Industry' (2017) 78 Marine Policy 122 https://doi.org/10.1016/j.marpol.2016.10.024.

The Humber region has positioned itself as the UK's "Energy Estuary", reflecting its strategic importance in energy supply, industrial processing and maritime logistics.[437] Local institutions such as Hull City Council and the Humber Local Enterprise Partnership have played key roles in identifying offshore wind as a strategic economic opportunity within the region.[438] Local public-private partnerships such as Green Port Hull have been responsible for promoting inward investment, securing a £26 million Regional Growth Fund to train and upskill workers for the renewable sector.[439] Despite this, Evans notes that governance has often been "opportunistic and reactive", lacking long-term forward planning.[440]

More recently, a more strategic approach to regional industrial decarbonisation has emerged through the Humber Industrial Cluster Plan (HICP). The HICP was set up in 2021, with funding by UKRI, with the aim of achieving net zero by 2040 through carbon capture, hydrogen production, and fuel switching.[441] These projects require strong social licence to operate, influenced by earlier industrial and energy developments in the region,[442] yet stakeholder engagement reveals "a lack of trust created by previous industrial transitions" and fears of economic boom-and-bust cycles.[443]

This suggests that historical experiences of uneven benefits and unmet expectations continue to shape perceptions of fairness. Geels et al. identify institutional misalignments and coordination challenges within the Humber megaproject,[444] while Pollock points to "unaligned nation state policy and uncoordinated objectives", constraining coherence between energy, industrial, and regional strategies.[445] This governance fragmentation may limit the transparency of current and future transitions, further deepening mistrust within Humberside communities.

These developments sit within a wider policy context shaped by the UK Government's successive decarbonisations plans and retained EU rules.[446] Past EU funding mechanisms and broader state restructuring have driven a shift from centralised to decentralised, partnership-based governance, potentially positive for procedural justice and community inclusion.[447] However, persistent policy uncertainty and fragmented governance suggest that structural changes alone are insufficient. Delivering a just transition will require deliberate strategies to build trust, ensure benefits are shared, and address the legacies of past transitions that continue to shape perceptions of fairness.

[437] Clery and Gough (n 419).

[438] Lewis James Evans, 'Adaptation, Governance and Industrial Diversification: North Sea Ports and the Growth of Offshore Wind' (PhD Thesis - University of Newcastle 2020).

[439] Roland Yawo Getor, Amar Ramudhin and Samira Keivanpour, 'Social Acceptability of a Wind Turbine Blade Facility in Kingston upon Hull' (2022) 379 Journal of Cleaner Production 134859 https://doi.org/10.1016/j.jclepro.2022.134859.

[440] Evans (n 438).

[441] Phil Northall and others, 'Humber Industrial Cluster Plan - Societal and Cultural Challenges and Social Innovation Study' (2023).

[442] Clery and Gough (n 419).

[443] Northall and others (n 441).

[444] Frank W Geels, Benjamin K Sovacool and Marfuga Iskandarova, 'The Socio-Technical Dynamics of Net-Zero Industrial Megaprojects: Outside-in and inside-out Analyses of the Humber Industrial Cluster' (2023) 98 Energy Research & Social Science 103003 https://doi.org/10.1016/j.erss.2023.103003.

[445] Robert Pollock, 'Creating Regional Industries: Path Creation and Offshore Wind in the UK' (PhD Thesis -- Newcastle University 2019).

[446] Clery and Gough (n 419); Morrissey (n 60).

[447] David C Gibbs and others, 'Governance, Institutional Capacity and Partnerships in Local Economic Development: Theoretical Issues and Empirical Evidence from the Humber Sub-Region' (2001) 26 Transactions of the Institute of British Geographers 103 https://doi.org/10.1111/1475-5661.00008.

6.3.2. Social inequality, work, and identity

1) Traditional and early industrial maritime economy (18th century – 1940s)

In the early industrial period, the Humber Estuary region experienced demographic and social shifts alongside maritime expansion. The diversion of whaling vessels to broader foreign trade, combined with improvements in waterway infrastructure driven by the Industrial Revolution, spurred population growth and urban development in the Humber region. [448] As older maritime trades, such as whaling, entered periods of decline, the development of shore-based fishing activities grew, allowing whalers to transition into new industry. [449] These developments laid the groundwork for the emergence of tight-knit maritime communities whose livelihoods were increasingly tied to the patterns of port and fishing economies.

Living standards for many fishers were precarious, and while deep-sea trawler skippers were well-paid, their job security was fragile, with employment often dependent on the success of their most recent voyage. [450] Many fishing families endured extreme poverty, with prolonged bad weather forcing families to go hungry. [451] These hardships were compounded by structural pressures, including rising fuel and labour costs, further straining the industry's viability and triggering employment reductions in distant-water fleets. [452]

Alongside these pressures on established workers, young entrants faced growing risks as the apprentice system, once a pathway into the industry for boys from workhouses and reformatories, came under scrutiny for exploitative practices. Boswell notes that many apprentices were recruited at a very young age - sometimes as young as twelve - and were bound by contracts that promised training and care but often failed to deliver. [453] Ekberg describes how some apprentices, lacking supervision, fell into cycles of poverty, crime and incarceration, with many living in squalid conditions and becoming vulnerable to exploitation in Grimsby's dockside environment. [454] The system, which had initially promised training and support, increasingly resembled a form of indentured labour, with boys effectively treated as prisoners aboard fishing vessels. [455]

[448] East (n 417).

[449] Robinson and Coull (n 423).

[450] Arthur Godfrey, *Yorkshire Fishing Fleets the Story of Yorkshire's Oldest and Most Dangerous Industry* (Dalesman 1974).

[451] ibid.

[452] Yorkshire and Humberside Economic Planning Board Research, *The Fishing Industry, Its Economic Significance in the Yorkshire and Humberside Ports a Report* (Yorkshire and Humberside Economic Planning Board 1977).

[453] Boswell (n 416).

[454] Ekberg (n 425).

[455] ibid.

2) Heavy industry and oil and gas (1950s – 1990s)

The collapse of major firms, such as Consolidated Fisheries Ltd, in the early 1980s signalled a wider industrial decline of the Humberside fishing industry, with Grimsby-based companies entering liquidation and the number of fish merchanting businesses falling from around 600 post-war to fewer than 25 by the mid-1980s. [456] The social consequences of this industrial transition were significant.

The contraction of the fishing industry fractured deeply rooted cultural and spatial identities, disrupting livelihoods and dismantling the close-knit communities that had long defined maritime life in the region. As one account notes, "everything was geared to the rhythm of fishing", and the collapse of this rhythm led to dispersal, urban disadvantage and a loss of shared identity. [457] In Hull, the dockside neighbourhood of Hessle Road - once a locus of maritime life - saw a breakdown of social cohesion. [458] While some vessels and workers were redeployed into the emerging North Sea oil sector, these shifts rarely replicated the connectedness and cultural embeddedness of the earlier fishing economy. [459]

Testimonies from former Grimsby fishers underscore the depth of injustice experienced during the industry's collapse. Many described feelings of being "sold out" and highlighted the absence of redundancy payments, despite decades of service: "You've spent a full lifetime at sea, and then you're just kicked to one side... offered nothing, absolutely nothing". [460]

These experiences indicate that the industry's decline was felt not only as an economic loss, but as an inequitable and poorly managed transition for those most directly affected.

The expansion of the oil and petrochemical industries in the Humber region during the mid-20th century brought significant employment opportunities but also introduced new forms of economic vulnerability. As global oil prices fluctuated and competition intensified, the petrochemical sector faced mounting pressures. By the 1980s, firms such as BP, Shell, and ICI began to retrench or exit the region, leading to job losses and reduced benefits for workers. [461]

The Thatcher government's commitment to free-market principles meant limited state intervention, further exacerbating the economic insecurity faced by communities reliant on these industries. The social consequences of these shifts included declining job stability, weakened labour protections, and added to the growing sense of disconnection between industrial policy and local needs. [462]

[456] ibid.

[457] Byrne (n 426).

[458] ibid.

[459] ibid.

[460] John Goddard and Roger Spalding, *Fish 'n' Ships the Rise and Fall of Grimsby - the World's Premier Fishing Port* (Dalesman Books in association with Channel Four Television Company 1987).

[461] Geels (n 434).

[462] ibid.

3) *Net-zero transition: offshore wind, hydrogen and CCS (2000s – present)*

The collapse of the fishing industry and after-effect of the earlier oil and gas transition continues to shape community responses to the Humber's current low-carbon transition and has left a legacy of intergenerational welfare dependency and entrenched deprivation in parts of the Humber region. [463] Research conducted as part of the HICP highlights how previous boom-and-bust cycles "have challenged individuals and communities in the Humber, without necessarily delivering benefits for them and this has created a level of caution around the potential effects of the low-carbon energy transition". [464]

While new technologies such as hydrogen and CCUS offer economic promise, there are concerns that rapid transitions could reproduce past patterns of exclusion, particularly through labour and skills shortages, and that the benefits of decarbonisation may be unevenly distributed. [465]

While new jobs and the wider economic and social benefits of low-carbon transition are welcome, there are concerns about the pressure these developments would place "on existing infrastructure unless maintained and upgraded". [466] It is clear that earlier experiences of past injustices continue to shape expectations of current and future transitions.

Nevertheless, the emergence of the offshore wind sector has brought new employment opportunities and a partial reconfiguration of local identities. The Siemens Gamesa blade facility in Hull, for example, created over 1,000 direct jobs and contributed to a 4.2% increase in local economic output between 2016 and 2018. [467] The facility was widely perceived by residents as a positive development, helping to counter Hull's image as a deprived city and attracting further investment. Over 800 apprenticeships were created, and the city was ranked the third-most improved UK city to live and work in 2018. [468]

[463] Hull City Council, 'Hull's Economic Strategy 2021-2026' (2021) <https://data.hull.gov.uk/wp-content/uploads/HCC-Economic-Strategy-2021-2026.pdf> Accessed 8 December 2025.

[464] Northall and others (n 441).

[465] ibid.

[466] ibid.

[467] Getor, Ramudhin and Keivanpour (n 439).

[468] ibid.

6.4. Conclusions - marine energy transitions and justice in Humber

The Humber's transitions, from whaling and fishing, through petrochemicals, to decarbonisation industries today, reflect the precarity of marine transitions and the associated justice issues. In terms of procedural justice and participation, growth-oriented governance and megaproject coordination leave participation gaps: decisions taken beyond local arenas, compressed timelines, and reactive planning that erode trust.

The distribution of burdens and benefits through the process of maritime transitions, has not been just or even, with gains accruing to asset owners and new sectors, and costs falling on fishing communities and deprived neighbourhoods. In the aftermath of fisheries decline, historic compensation bypassed trawlermen; and current low-carbon investments risk uneven access without targeted pathways for workers and communities. Those most affected (apprentices, fishers' families and later petrochemical workers) are still marginal in planning and decision-making.

These patterns require a different governance approach than the centralised and reactive one taken so far. Instead, early and iterative engagement with robust social impact assessment is required. To facilitate local capacity-building and employment, binding local-content, training and apprenticeship commitments are needed from private and public actors. Net zero projects offer real economic opportunities, but legacies of unmanaged change and mistrust demand participation, fair distribution, and recognition of lived experience. Aligning cluster ambitions with durable, inclusive local benefits is essential if the "Energy Estuary" is to deliver a just transition for coastal communities. Clear accountability, transparent metrics, and long-term funding will be needed to sustain trust and impact across projects and communities.

7. Cross-case comparison: Lessons from Orkney, North East Scotland, & the Humber Estuary

7. Cross-case comparison: Lessons from Orkney, North East Scotland, & the Humber Estuary

This section synthesises evidence from the three case study regions – Orkney, North East Scotland, and the Humber Estuary – to identify shared patterns, key differences, and their implications for a just MET in coastal communities. While each region has uniquely experienced maritime and industrial change, comparing these regions illustrates both effective practices and recurring challenges, and offers learnings for the design and governance of current and future METs. The following themes cut across all three cases and identify shared conditions that have constrained, or in some instances supported, the implementation of a just MET in coastal communities.

7.1.1. Theme 1: Centralised, reactive governance and local agency

Across Orkney, North East Scotland and the Humber Estuary, there is a consistent pattern in which marine and coastal governance remains heavily centralised, with key decisions made predominantly at the national level rather than within the communities most affected by METs (see section 3.5.1). Centralisation has been embedded in marine resource governance within the UK from early feudal land tenure and absentee landlordism in Orkney, to the nationally negotiated fisheries policies that shaped the Humber's distant-water fleets, and the market-led governance of North Sea oil in the North East of Scotland. In all three cases, METs have unfolded within governance frameworks that prioritise national economic interests and industrial strategy, often at the expense of local communities.

Centralised governance limits local influence in decision-making, yet responsibility for managing the impact of transitions remains local through local infrastructure or social policies. Across all three regions, communities have been expected to accommodate and adapt to marine energy developments, despite having little control over strategic decisions such as timing, scale, or spatial impact. This has produced a recurring governance challenge in which responsibility for managing social, economic, and environmental impact is devolved downwards, while authority over transitions and economic policy remains concentrated at the national level. This results not only in procedural justice issues, but a misalignment between decision making and impact, limiting the ability of local stakeholders to anticipate impacts, shape outcomes, or plan for long-term change particularly when boom and bust cycles are prevalent and where there are increased demands on local populations. Place-based research on just transitions demonstrates that without regionally embedded planning and evaluation frameworks, national transition strategies fail to reflect local priorities, reinforcing the disconnect between where decisions are made and where their impacts are experienced. [469]

In addition to the centralisation of governance, across case studies this has been, by and large, reactive to sectoral change and incoming industries. By contrast, evidence from Orkney illustrates how early anticipatory planning (noting that decision-making remained centralised at the UK level) can shape more equitable outcomes, with the Orkney Islands Council Act (1974) and the Reserve Fund demonstrating how strategic foresight allowed the community to retain value and manage the social impacts of rapid industrial change.

Recent policy developments indicate recognition of the need for more forward-looking transition planning within the North Sea context. The recently published North Sea Future Plan, [470] includes initiatives such as the Clean Energy Jobs Plan and the establishment of the North Sea Future Board, signalling a shift towards supporting future employment pathways alongside the managed decline of oil and gas activity.

[469] Shapovalova and others (n 167).

[470] UK Government (n 161).

However, it remains unclear how far such initiatives will go and their ability to create jobs at the scale required to support a just transition. Ensuring a just MET therefore depends on how far these governance approaches are able to continue moving beyond impact mitigation and sectoral decline, towards sustained and anticipatory planning for the green energy economy.

7.1.2. Theme 2: Recurrent boom-bust cycles leading to entrenched socioeconomic hardship

Although Orkney, North East Scotland and the Humber Estuary have distinct maritime and industrial histories, the case studies illustrate a shared pattern of repeated expansion and contraction of key maritime sectors for the regions, linked to externally driven forces. Across fishing and whaling, oil and gas, and heavy industry, periods of rapid growth have been followed by sharp downturns, generating economic volatility and workforce insecurity, as well as wider socioeconomic impacts. Such boom-bust cycles are commonplace across the wider transitions literature.

In the context of METs however, the case studies show that the impacts of boom-bust cycles are cumulative rather than discrete, with each successive transition ending in a declining industry and layering new forms of disruption onto existing fragility. Over time, this has resulted in persistent economic hardship and deprivation across the regions, with deprivation still entrenching areas within the Humber region and the North East of Scotland in particular, in economic fragility.

These cumulative economic impacts also map onto deeper social and cultural consequences for coastal communities. Across case studies, successive transitions have reshaped local identities and social hierarchies, often eroding sources of pride, status, and social cohesion.

For example, fishermen, who once held social standing and influence experienced a loss of status as industries declined, while the North East of Scotland's shared identity as the "Oil Capital of Europe", which once provided a sense of collective purpose and pride, has now been destabilised by the contraction of the oil industry. As each transition has unfolded across these coastal regions, shared identities and sense of place have weakened, contributing to social fragmentation and the gradual erosion of community cohesion.

At the same time, the evidence across case studies highlights the potential for innovation and new forms of activity to support the re-emergence of place-based identity and pride. In Orkney, the establishment of EMEC has contributed to a renewed sense of the islands as a centre of marine energy research and innovation, while in the Humber Estuary, the branding of the region as an "Energy Estuary" plays a similar role in reestablishing a collective identity around low-carbon energy futures. In Aberdeen, however, similar efforts that could reframe regional identity through initiatives such as the Energy Transition Zone have been more contested, reflecting tensions around land use and local consent.

While orderly and managed transitions play an important role in reducing the economic volatility associated with boom-bust cycles, focusing on economic management alone is insufficient for a just transition. The cumulative social and cultural impacts of successive transitions have proven equally consequential for long-term regional wellbeing across case study regions. Transitions with awareness of these cumulative effects, and that are shaped with communities rather than imposed through successive rounds of externally driven change, are more likely to support just transition outcomes in coastal regions.

7.1.3. Theme 3: Benefit distribution and outward value flows

METs across the three case study regions demonstrate a recurring misalignment between where economic value is generated, where transitions impacts are experienced, and where long-term benefits and burdens are retained. Despite differing historical and sectoral contexts, Orkney, North East Scotland, and the Humber Estuary have each hosted infrastructure and absorbed social, economic, and environmental change, while ownership and profit capture have largely remained external to the regions, contributing to persistent economic hardship. This pattern reflects long-standing investment and ownership arrangements that have characterised successive maritime and industrial transitions.

Evidence from the case studies indicates that these outward flows of value have contributed to the reinforcement of existing inequalities and limited the capacity of the case study regions to translate industrial activity into long-term socioeconomic benefit. As outlined in earlier sections (section 3.5.1), revenues and control have typically accrued at national levels or with corporate actors, while local communities have borne the cumulative impacts of transitions. This dynamic helps explain why successive rounds of development and redevelopment have not delivered sustained regional growth, despite periods of significant economic activity.

Marine renewable energy introduces an opportunity to move away from these historical patterns of economic outflow through its scalability and the potential for alternative ownership models. Unlike oil and gas, renewable energy technologies can operate at multiple scales, creating opportunities for shared or community ownership that enable some degree of local value retention. Community and shared ownership models, as demonstrated in Orkney in particular, where supported by enabling policy frameworks and institutional capacity, can have tangible local benefits, such as revenue generation through export to the grid. [471]

At the larger end of the scale, offshore wind development raises renewed concerns and risk replicating past outward value flows. Evidence from ScotWind leasing rounds indicates that ownership, financing, and profit capture remain dominated by external actors such as international states (e.g., ESB Group, Ireland and EnBW AG, Germany) and fossil fuel companies (e.g., Shell, BP, TotalEnergies), [472] with relatively weak mechanisms for retaining long-term economic benefits within host regions. Without deliberate intervention to reshape how value is captured and redistributed, the expansion of offshore renewables risks replicating patterns in which coastal regions host infrastructure and absorb impacts while economic benefits accrue elsewhere, mirroring earlier experiences across all three case study regions.

[471] van der Waal (n 234)

[472] Future Economy Scotland 'Who Owns ScotWind?' (2025) <https://www.futureeconomy.scot/scotwind> Accessed 19 December 2025472 UK Government (n 161).

8. Conclusions & next steps

8. Conclusions and next steps

This REA has examined how just transition is framed, experienced, and governed in coastal communities at the centre of past, current, and future METs, drawing on evidence from Orkney, North East Scotland, and the Humber Estuary. Taking a case study approach, the review highlights how justice concerns are shaped by place, history, and governance context. Across all three cases, METs are not experienced as discrete events, but as cumulative processes layered onto past social, economic, and cultural conditions shaped by successive maritime and energy industries. For current just transition planning, this highlights the need to address the legacies of past and declining industries while simultaneously governing emerging sectors, ensuring that processes of decline and growth are managed in ways that are sustainable, inclusive, place-based, and considerate of long-term community impact.

Transitions perceived as unjust are rarely the result of energy change alone but instead reflect the interaction of a lack of joined up governance, uneven or unclear regimes of benefit distribution, constrained local capacity, and the legacies of past extractive industries. Where transitions have generated local benefits, these have tended to be associated with early anticipation of social impacts and mechanisms for retaining value locally, highlighting the importance of viewing just transition not only as a policy objective, but as a governance and societal challenge that progresses over time and across scales, requiring anticipatory and coordinated approaches rather than reactive or sector-specific interventions.

This REA is shaped by limitations inherent in database-driven evidence reviews, including uneven availability of relevant materials across regions, the exclusion of some key texts, and the inclusion of a mixed evidence base ranging from peer-reviewed publications to grey and self-published sources.

These patterns reflect broader issues of digitisation, discoverability, and archival accessibility, particularly for historical material. The findings should therefore be interpreted as a structured synthesis of evidence available at the time of analysis rather than an exhaustive account of all possible sources.

While our analysis has focused largely on place specific outcomes across our case studies of Orkney, North East Scotland and the Humber region, we have identified some common and enduring questions at scale that could be considered common to marine transitions and that need to be addressed to secure inclusive and just transitions. The issue of hierarchical and disconnected governance remains a significant problem in the UK. While we have emerging policy frameworks that are committing to a sustainable future for the North Sea, these are not backed by regulatory measures and could be considered transient and embedded within short term political cycles.

The UK initiated world leading legislation on climate action in the form of the 2008 Climate Change Act and was one of the first countries to do so. To secure a just transition for maritime communities, there needs to be a strong legislative basis for progress, support, reporting, and transparency. Strong national frameworks are essential, but on their own they are not enough, particularly when we have noted the impacts of a lack of local control or more importantly, the positive effect when local control is supported. The lesson here is that there needs to be vastly improved integrated governance regimes from transition that draw upon the consistency of national regulation and policy but work with effective local and regional elements. Our experience to date is that there is significant disconnect between these scales and a need for integrated regional planning that cuts across jurisdictions.

Boom and bust cycles have been a consistent and highly impactful feature of transitions within coastal communities for decades, if not hundreds of years. The shifts between energy systems and the fluctuations in marine resource regimes such as fisheries have not always benefited communities. We have uncovered evidence from across our regions and generations that these changes can negatively impact the social fabric of a community and lead to substantive social and economic impacts such as deepening unemployment. Often the benefits of such transitions have materialised in the hands of a limited few or the process of change has been left to be determined by market forces. History in our regions has highlighted many examples of failed transitions, marine or otherwise.

Looking at the lessons here, we observe several key factors for developing successful transitions that are inclusive and offer a fairer distribution of the benefits and burdens. This includes planning for transition before it happens, building in rigorous and inclusive societal engagement, support for diversifying the economic base (including in non-marine sectors) and innovative sectors and start-ups and actively managing the transition process to ensure benefits flow to the workers and the communities that support and build them.

Reform to how benefits are generated and distributed from renewable energy installations is a key recommendation. Our cases have shown how there is a spatial disjuncture between where energy is produced, where economic value is directed and where impacts are experienced. Often benefits are accrued informally or in ad hoc processes or do not fundamentally address the needs of communities. More formalised approaches, including the need for regulation, are necessary to ensure that the transition to renewable energy is responsive to societal needs, that there is pooling and systematically informed distribution of benefits and that host

communities are able to derive positive impacts from hosting the transition – not only through increased employment but also addressing the structural challenges around infrastructure, housing, cost of living and health.

The findings of this REA provide a foundation for the next stages of the TRANSECTS project. They will inform targeted research with coastal communities and stakeholders, support more detailed policy, economic, social, technological, legal, and environmental (PESTLE) analysis, and help shape future engagement activities focused on identifying just, inclusive, and place-sensitive pathways for METs. More broadly, the review provides a comparative and historically informed evidence base to support the project's wider aim of connecting current policy debates to past and ongoing maritime and energy change, and to inform how future transitions are designed, governed, and experienced in coastal communities.

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Economic and Social Research Council

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NCEA Natural Capital and Ecosystem Assessment

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