Energy Research & Social Science 101 (2023) 103135

Contents lists available at ScienceDirect

Energy Research & Social Science

journal homepage: www.elsevier.com/locate/erss

Original research article

Diving into a just transition: How are fisheries considered during the emergence of renewable energy production in Scottish waters?

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ARTICLE INFO

Keywords:
Energy justice
Fisheries
Environmental impact assessment (process)
Marine renewable energy
Planning

ABSTRACT

Infrastructure at sea to accommodate a transition to renewable energy and meet global climate commitments is proliferating around the world. Although there is seemingly more space at sea than on land for these new developments, anticipated and existing conflict with existing marine users such as the fishing industry have raised concerns. Yet, countries around the world have committed to a just energy transition, which should avoid disproportionate impacts on specific communities. This study introduces a framework that considers three dimensions of justice at different project planning stages to analyse whether strategies to foster justice for fisheries align with remaining barriers to justice. It was used to understand how existing and planned cable and renewables projects in Scottish waters account for energy justice in relation to the fishing industry. Procedural justice aspects of project planning have improved over time, with greater involvement of the fishing industry during the siting and design of projects. However, resource constraints limited the involvement of smaller fishing fleets, indicating a barrier to recognitional justice. Distributional justice at project level was steered by decision-making at a national level, and national targets for renewable energy generation made the fishing industry feel they are not on equal footing with project developers. The findings of this study provide key insights into the multiple dimensions of energy justice and their implications for the consideration of fisheries. Identified best practices and potential barriers to a just transition can be helpful for other nations seeking to introduce new developments into their marine space.

1. Introduction

Industrial energy transitions, such as the current transition from fossil fuels to renewable energy sources, create winners and losers [1]. Therefore, mechanisms need to be put in place to consider the 'justness' of this transition. Current practice is to mitigate adverse effects [2,3]. However, social justice [4] and energy justice [5] require more than this, as this paper explores in relation to the impact of offshore energy developments on the fisheries sector in Scotland.

Loss of access to fishing grounds has been highlighted as the most concerning impact on the fishing industry of the emergence of novel marine energy developments [6–8]. It has caught the attention of decision makers at European, North Sea and national levels [9–15]. A systematic review has highlighted lost access to marine resources for food security and wellbeing to be one of the ten categories of injustices identified as a result of the emergence of novel developments at sea [16]. Along with existing regulations such as marine protected areas and quotas, fishers are increasingly having to share marine space with new developments such as subsea cables and offshore wind projects [17–20]. This paper therefore analyses how the siting and impact assessment process for renewable energy and cable developments in Scottish waters fosters or prevents three components of justice for fisheries, through case study analysis. We start with an overview of the theoretical framework developed for this study.

2. Theoretical framework

This section sets out the theoretical framework for this study, which

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https://doi.org/10.1016/j.erss.2023.103135
Received 19 December 2022; Received in revised form 27 April 2023; Accepted 8 May 2023
Available online 19 May 2023

consists of two parts. It combines concepts of the mitigation hierarchy (Section 2.1) with the multiple dimensions of energy justice (Section 2.2). The section concludes with a statement of aims.

2.1. Mitigation hierarchy for socio-economic impacts

A typical approach for developers of a proposed project to minimise environmental and socio-economic impact is by adopting a mitigation hierarchy [2,21–23]. It consists of three different levels, 1) avoid impacts as a form of primary mitigation, 2) impacts are minimised with secondary mitigation measures, and in some instances 3) impacts are compensated for. These mitigation options may be embedded within a wider process such as a cost benefits analysis (CBA) (e.g. [24]). CBA is an economic evaluation tool to compare the costs and effects of alternative interventions, however it requires positive and negatives impacts to be monetized and contrasted [25–27]. A CBA is normally conducted at a single stage of a design process, e.g. strategic planning or project level design. Here the mitigation measures are examined across all stages of project development. In contrast to how costs and benefits are compared in CBA, the mitigation hierarchy adopts a sequential approach to the mitigation options, indicating a logic of preferentially avoiding impacts, and reserving compensation as a last resort. This approach does not necessitate the monetisation of measures, something CBA has been criticised for [28].

Primary mitigation includes changes in the location or design of the project, during the strategic planning (e.g. sectoral plans) or pre-application stage, before the developer applies for a licence [29]. Statutory measures are in place to ensure the developer considers the needs of other marine users before they can obtain a licence/consent, through Scotland's National Marine Plan [30] and the sectoral marine plans [31,32].

Secondary mitigation measures require specific action by the developer to reduce the significance or likelihood of impacts and may be imposed as licence/consent conditions by the licensing authority [29]. This could include timely communication with marine users prior to installation works or temporal measures applied as a licence condition to reduce impacts during construction e.g. avoiding fish spawning season [33,34]. For example, in the French part of the English Channel, aggregate extraction is prohibited during the herring spawning season [35–37]. Compensation is considered the last resort in the mitigation hierarchy and can involve financial means to offset residual impacts [21], however, Scottish legislation does not obligate developers to compensate impacted marine users such as fishing and shipping. Where compensation measures are implemented, it can take the form of either a disruption settlement (monetary payment to specific vessels) or a fisheries community fund, which is defined as "a fund established by an OREI [offshore renewable energy installation] developer which is to be used for the general betterment of the members of a fisheries community" [38].

One limitation to the mitigation hierarchy in the context of this study is that it only considers the elimination/reduction of negative impacts, whilst changes induced by the development of a project may also result in benefits or positive impacts, which should be maximised to facilitate energy justice. Emerging industries such as offshore renewable energy can provide an alternative source of revenue and diversify local economies, providing employment opportunities such as guarding duties and survey assistance [6,39–44]. Guard vessels are employed during the construction phase or for maintenance and cable repair operations, and safeguard the safety zones set up to avoid disturbance of the vessels carrying out an operation [33].

Therefore, the three levels of the mitigation hierarchy were extended to create a more comprehensive mitigation hierarchy that encompasses both positive and negative impacts, the latter consisting of the two mitigation stages as well as residual impacts and compensation, similar to the mitigation and conservation hierarchy [45] (Fig. 1). Residual impacts are defined as predicted negative impacts of the proposed project on the fishing industry (such as loss of access), after a project already implemented primary and secondary mitigation measures. Positive impacts are defined here as direct positive socio-economic impacts on the Scottish fishing industry, such as employment or improved infrastructure related to fisheries operations, similar to the interpretation of 'opportunities' in [7]. Fig. 1 maps out the components of the socio-economic mitigation hierarchy adopted for this study on a 'Fisheries socio-economic impacts' axis. This visualisation should only be interpreted as relative change, as fisheries socio-economic state cannot necessarily be quantified.

As this study is focusing on a specific receptor (the fishing industry), broader benefits of renewable energy developments such as access to

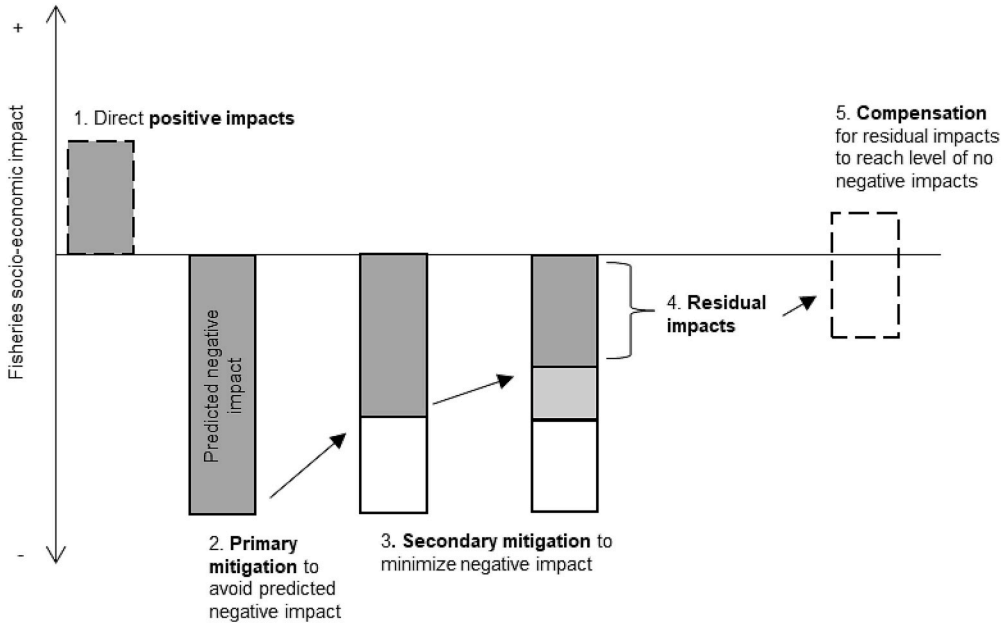

Fig. 1. Diagram illustrating the socio-economic mitigation hierarchy defined for this study. (Adapted from [23,45,47,48]).

low carbon electricity are not accounted for here. 'Positive impacts' and 'Compensation' are represented with dashed lines to indicate these are not always documented within an EIA process for assessing impacts on marine users in Scotland. Compensation is often negotiated post consent, and impacts on fisheries of renewable energy developments are focused on assessing negative impacts, i.e. fisheries displacement as a result of loss of access to fishing grounds [46]. Together with the second part of the framework (see Section 2.2), this socio-economic mitigation hierarchy will be used to consider both positive and negative potential impacts of renewable and cable projects on the fishing industry.

2.2. Three dimensions of energy justice

Energy justice as a form of social justice theory has three tenets: distributional, procedural and recognitional justice [5,49]. It is relevant to the 'just transition' in energy production and consumption that countries have mandated as part of the solution to the global climate emergency.

Here, energy justice for fisheries is considered in the context of renewable energy generation at sea, and it will depend on the relative opportunities and impacts energy projects bring to the fishing industry, as well as on which mitigation measures are implemented to reduce impacts (distributional justice). In addition, our framework assesses the engagement processes (procedural justice) and the extent to which these processes recognise and respect sub-communities within fishing (recognitional justice). This interpretation of energy justice focuses on how the potential loss of fishing grounds is considered, and should be viewed as part of a wider, more holistic interpretation of energy justice which also considers justice implications for other groups in society, such as recreational fishers, environmental groups, on-shore residents and, more broadly, the justice implications of decarbonising our energy system [50].

The mitigation hierarchy can be used to analyse the consideration of distributional justice, a theory linked with works from Rawls and Dworkin [51–56] which is concerned with how negative impacts and benefits are "allocated among society" [57]. But Fraser argued that there was more to social justice than economic *redistribution*, the dimension implicit in the mitigation hierarchy. She added the second dimension of socio-cultural *recognition*, "rooted in social patterns of representation, interpretation and communication" [4]. She noted that the two dimensions required different sorts of remedies for injustice, and assumed different conceptions of the "collectivities" suffering injustice. She proposed the need for *participatory parity* as a political mechanism to integrate the two dimensions and achieve both fair distribution of economic resources and fair recognition of differences within social groups. Fraser gave two necessary conditions for participatory parity: "First, the distribution of material resources must be such as to ensure participants' independence and 'voice.' Second, the institutionalized cultural patterns of interpretation and evaluation express equal respect for all participants and ensure equal opportunity for achieving social esteem" [58]. These two conditions are considered in the two-part framework presented here.

Using this framework, our study examined impacts on fishers arising from offshore developments. Definitions of the evaluative components of the three dimensions were explicitly defined and made relevant to the fishing sector:

- *Distributional justice:* what are the impacts and benefits for individuals/groups within the fishing industry of the developments?
- *Procedural justice*: what processes exist to include or exclude individuals/groups from meaningful debate about a development?
- *Recognitional justice*: who (or, which groups) within the fishing industry are acknowledged, ignored or misrepresented in consultations and impact assessments?

The alternatives given in each case (individuals/groups) aim to embrace both individual-based and collective-based perspectives on social justice. The three justice dimensions are visualised in Fig. 2. It should be noted that each tenet of justice cannot be considered in isolation. For example procedural justice, illustrated by considering fisheries at each step in the project planning process in Fig. 2, will influence distributional justice, as well as the recognition of sub-communities at each engagement step (recognitional justice). This interdependence is represented with the dashed lines between each tenet of justice in Fig. 2.

The aim of this study is to analyse how the siting and impact assessment of offshore renewable energy and cable developments consider energy justice for the commercial fishing industry. To date, this has not been undertaken in a comprehensive way at a Scottish level, or for cable developments as well as offshore wind and tidal projects. As the renewables and cables industry has grown, it is now timely to analyse existing projects with perceptions of actors involved. This study includes both cable and renewable energy projects to provide a more comprehensive picture of the interactions with these development types experienced by fisheries. Inter-isle cable replacements were also included, to allow a comparison between projects that have been in place for over 50 years (the inter-isle cables), with newer sectors that may be perceived as having the burden of setting a precedent for future projects. The effectiveness of current practice in facilitating a just transition for the fishing industry during project planning was evaluated using a selection of case studies dating between 2011 and 2020, so temporal changes in practice could also be considered. The focus of this study is on Scottish marine energy projects as they take place within the framework of the same overarching legislation, namely the Marine (Scotland) Act 2010 (for projects within 12 nautical miles (nm)) and the UK Marine & Coastal Access Act 2009 (for projects out with 12 nm) [59,60].

3. Methods

3.1. Case study selection

A case study protocol was developed based on case study methodology literature [61,62]. The unit of analysis across case studies was the

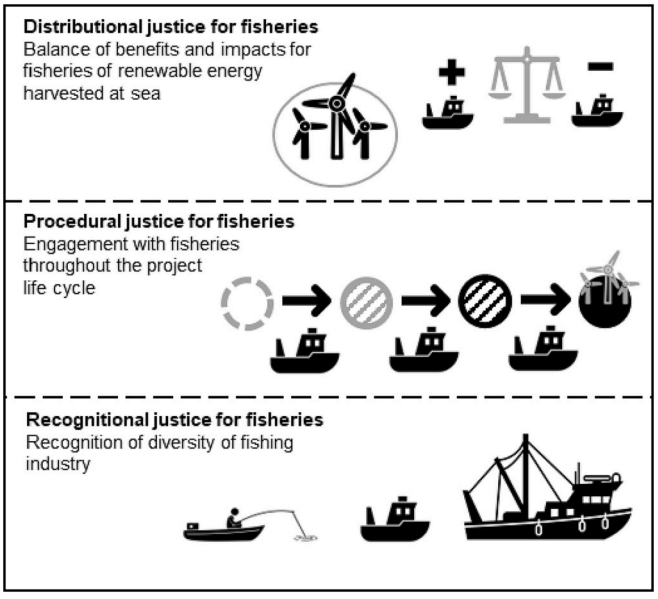

Fig. 2. Diagram illustrating how the three dimensions of energy justice are defined here. The ship pictograms represent (different types of) fisheries, and the dashed lines are used to indicate that the dimensions influence each other. Windmills icon created by Arif Fajar Yulianto and fishing boat icons created by Phạm Thanh Lộc, Gan Khoon Lay and Martin Lebreton from The Noun Project (https://thenounproject.com/).

Table 1
Criteria used to select case studies.

	Criteria	Sector-specific?	Justification
1	Identifiable interaction of the project with the fishing industry	Applicable to all	A case study is not relevant if fisheries impacts are scoped out of any environmental assessment.
2	Impact assessment publicly available	Applicable to all	Without the impact assessment documentation (environmental statement or equivalent) there is not enough information available to compare with other case studies.
3	Project completion after 2010	Applicable to all	After the implementation of the Marine (Scotland) Act 2010
4	Specifically for the offshore wind projects, commercial scale fixed offshore wind projects only (>100 MW)	Criterion for windfarm sector only	Avoid imbalance of offshore wind case studies compared to other sectors

consideration of fisheries throughout the consenting and development life cycle of renewable energy and cable projects. A list of all consented projects in Scottish waters within the relevant sectors was compiled, based on the Marine Scotland Licensing Operations website[1] (consulted throughout 2020) for the transmission cable, tidal and offshore wind projects, and on the SSEN projects page[2] (consulted May 2019) for the cable replacements. Projects were selected based on the criteria listed in Table 1.

The process of elimination led to a selection of 5–7 case studies per sector, and 23 case studies in total (Fig. 3). When the information was collected for the chosen case studies, they were at different stages in the project life cycle, which allowed a comparison of fisheries engagement at the various stages.

The consideration of fisheries by the case studies was analysed using a combination of qualitative document analysis and semi-structured interviews, allowing a triangulation of perspectives [63].

3.2. Compilation of publicly available project documents

Table 2 includes the document types that were collected for each of the case studies. The project planning phase of the 23 case studies occurred at different time frames and concerned different locations in Scottish waters, so care was taken to be conscious of these differences when interpreting results. For earlier case studies, not all documentation was available online. Consideration was given to important milestones that could affect the consideration of fisheries, e.g. whether project documents were published before or after the implementation of Scotland's National Marine Plan in 2015 [30].

3.3. Interview method

For recruitment of interviewees, relevant actors in the process were mapped out to identify three main interest groups: 1) developers working in the renewable energy or cables industry, 2) commercial fisheries and 3) government representatives. In this study the definition of commercial fisheries was based on a guidance document by the Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW) aimed at helping developers with fisheries liaison, and includes different gear types and vessel sizes, but does not include recreational fishing, and focuses on the UK fishing industry even though it is acknowledged that some foreign vessels have historic fishing access rights within the 6-12 nm limit [33,64]. The licensing authority (Marine Scotland Licensing Operations Team) is responsible for issuing licences for both offshore renewable energy and cable installations, which has been termed a 'one-stop shop' approach [65–67]. Within these three groups, subdivisions for specific interested parties were also identified to take into account differences within the overarching groups (Fig. 4). The mapping of interest groups was used during the recruitment of interviewees to ensure a balance of perceptions. In total 20 participants were interviewed, between January to September 2020, either individually ($n = 13$) or with colleagues ($n = 7$). Two in person interviews were conducted prior to the onset of the COVID 19 pandemic, after which 11 interviews were held via online video/audio calls and two over the phone.

Snowball sampling was initiated with purposive sampling to avoid bias and ensure each group was similarly represented. For this study, participants were interviewed in relation to their profession, sometimes called 'expert' or 'elite' interviewing [68,69]. All interviews were transcribed from audio recordings by the authors. Interview results were verified with the interviewees to avoid misunderstandings. Case studies and interviewees were anonymised, and when permitted by the interviewees, identifiable per interest group (fisheries, government or energy industry). Table 2 shows the relative representation of the interest groups in the interviews and project documents.

Semi-structured interviews captured the different perspectives on the consideration of fisheries during the project life cycle of energy developments (see Appendix A for interview guide). Individuals that had experience with the chosen case studies were selected where possible, to allow a comparison of their perspective with the results obtained from the document analysis. Some interviewees were familiar with multiple case studies, whilst others could give detailed insights on a specific case study. The interviews added depth and context to the findings derived from the project documents.

The theoretical framework (Figs. 1-2) was used to code the interviews and project documents with the three dimensions of justice and the five steps of the socio-economic mitigation hierarchy. This elucidated how the different stages of the projects influenced distributional, procedural and recognitional justice for the fishing industry. Procedural justice was analysed by identifying different forms of participation at each of the levels, and recognitional justice could be evaluated by noting which fishers were represented at which level, and report on any identified barriers to participation. During the interpretation of the results, results were only generalised across case studies when they were seen to be relevant to all case study types.

4. Results

Across the 23 case studies of energy projects in Scottish waters, 616 documents were gathered. The documents from the case study selection date between 2006 and 2020. Out of the 23 projects that were analysed for this study, 14 were not yet completed and 4 took between 5 and 11 years to progress to the operational phase. Results are based on findings through the interviews and project documentation available online, but the amount of publicly available information varied between case studies. Therefore, findings that have been drawn from this analysis may have overlooked events that played a role in the consideration of energy justice that were not identifiable in the interviews or in the consulted documents.

Throughout this section, "[D-#]" as a source refers to a project document (sources listed in the Supplementary information), and "[I-#]" refers to an interview. After an overview of the results across mitigation phases and dimensions of justice, including a graphical summary, results are organised according to the five different elements in the socio-economic mitigation hierarchy (Fig. 1).

[1] http://marine.gov.scot/mslot-all-application-and-project-documentation.
[2] http://news.ssen.co.uk/submarinecables/information/.

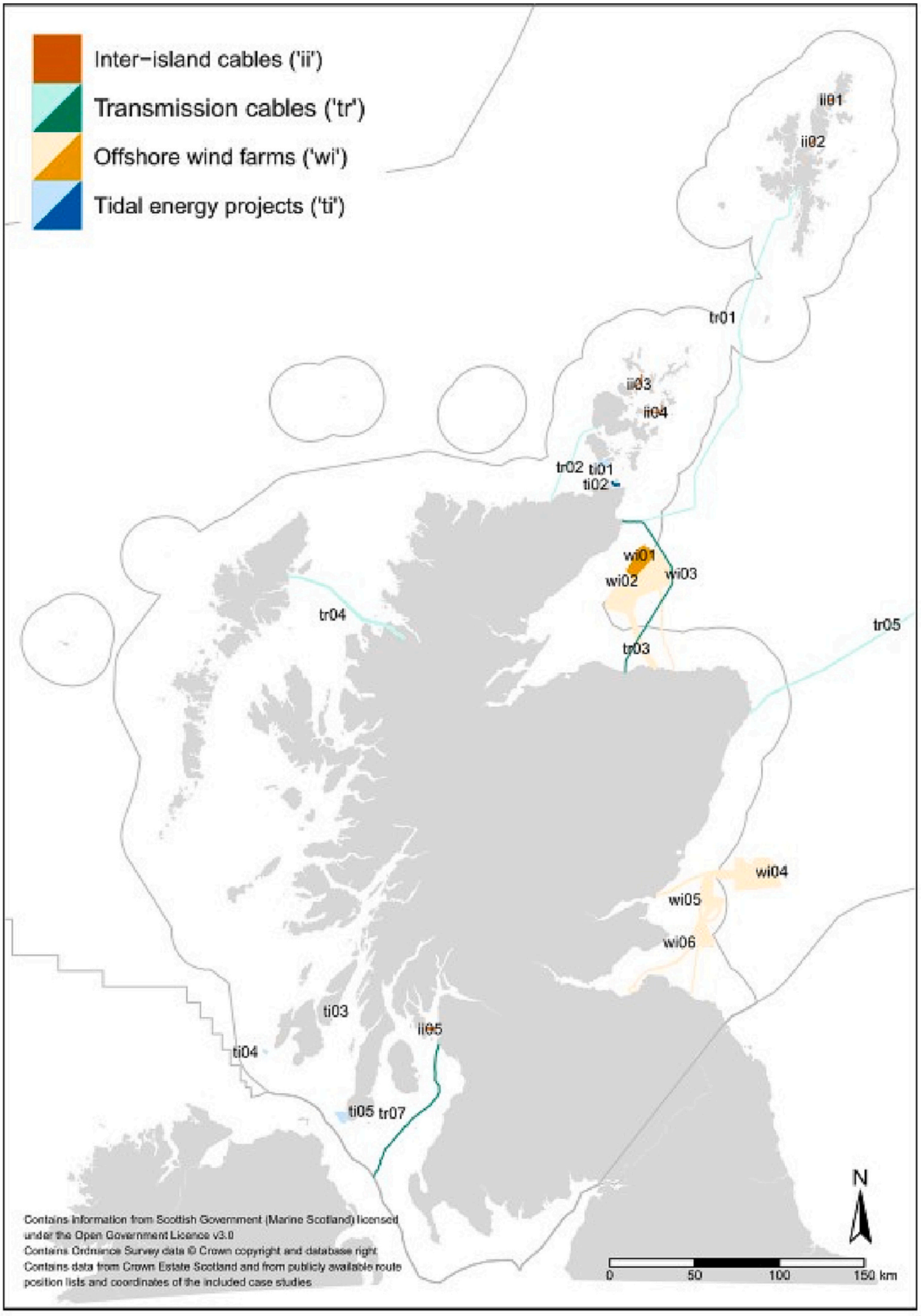

Fig. 3. Map of included case studies, with colours depicting development type. Projects that were not operational in October 2021 are indicated with a lighter shade. Grey lines are used to indicate the limits of the Scottish Exclusive Economic Zone (EEZ) and the territorial waters (12 nm zone).

Table 2
Interviews and documentation representing the three interest groups.

Interest group	No. interviewees	Documentation case studies
Developers	6	• Submitted documents required for a marine licence/consent: ○ Scoping report[a] ○ Pre-application consultation reports (including fisheries liaison meeting minutes) ○ Environmental statement[a] (main document and appendices) • Documentation required to adhere to licence/consent conditions (such as a Fisheries Liaison Mitigation Action Plan (FLMAP), Fisheries Management and Mitigation Strategy (FMMS) or Communications Strategy)
Government	6	• Scoping opinion[a] • Marine licences/consents issued and attached conditions • Formal consultation responses by government advisory body (statutory consultee)
Fisheries	8	• Formal consultation responses from non-statutory fisheries (incl. for the scoping opinion[a]) • Fisheries liaison meeting minutes in pre-application consultation reports

[a] Or comparable document for case studies not requiring a formal environmental impact assessment.

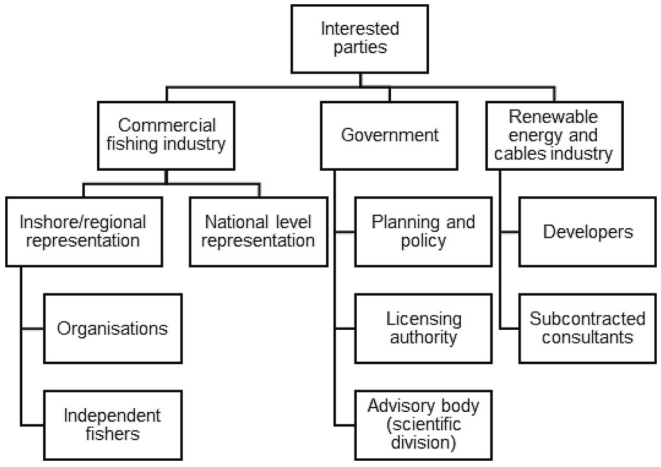

Fig. 4. Map laying out the groups Involved in the process of considering fisheries interests during offshore energy projects, from which interviewees were drawn.

4.1. Overview results across mitigation phases

Results across the five mitigation hierarchy steps (illustrated in Fig. 1) are summarised in Fig. 5, mapped along different stages of the project life cycle. The blue trapezium indicates potential for facilitating distributive justice is highest at the strategic planning stage by avoiding high value fishing areas. Once a project has obtained a spatially explicit licence there is less room to adjust location. The blue text boxes contrast short-term positive impacts (employment opportunities) and compensation (for temporary removal of static gear) with long-term perceived negative impacts. Potential discontinuities in communication identified in this study are marked in yellow and indicate barriers to procedural justice. The mechanisms in place to overcome discontinuities and facilitate continuous engagement to foster procedural justice are shown as pink arrows: the use of fisheries liaison officers, and commercial fisheries working groups at the post-consent phase. These also facilitate recognitional justice if they also reach out to fishing segments that are underrepresented. Table 3 summarises the findings per mitigation hierarchy step and per justice dimension. Distributional justice findings were relevant to all phases, and findings related to procedural justice mostly related to primary and secondary mitigation.

4.2. Positive impacts

Employment opportunities were identified as a potential positive impact for the fishing fleet by [I-03] and [I-05]. This was in the form of 'Guard work', where vessel operators are hired to patrol implemented safety zones and keep them clear of fishing gear and vessels. Several shortcomings were identified to achieving this positive impact. [I-07] highlighted a mismatch in timing of the opportunity, in that construction is likely to happen during calm sea conditions or *"prime fishing time"* [I-10], when it is more profitable to be out fishing. The work opportunity cannot be guaranteed to go to vessels potentially affected by the development due to procurement laws [D-9], although developers can encourage their contractors to use the local supply chain [D-7]. If the company providing guard work represents a nation-wide fleet, they can assign the work to members based locally [D-9], but only if they meet the required safety measures and vessel specifications, which was also highlighted as a barrier [I-07, I-09, I-10]. [I-10] and [I-11] highlighted the work opportunity is a short-term benefit for a few vessels.

4.3. Primary mitigation

To avoid impacts, fisheries activities and preferences were considered during the siting process, as well as during design decisions, such as for the spacing of turbines ([D-2], [D-18]–[D-21], [D-27], [D-28], [D-29]). For cables, impacts can be avoided by maximising the proportion of the cable that can be buried as opposed to being protected with rocks 1 [I-03]. Project documentation and interviews indicate cable burial can reduce the risk of fishing gear snagging on the laid cable if cables are buried deep enough [D-42]– [D-44], [I-03], [I-13]. Whilst fisheries representatives were engaged with to collect information about fishing activities, [I-10], [I-11] and [I-14] indicated they did not have the chance to share their seabed knowledge during cable routing to identify where burial is possible.

There are differing opinions of the level of access for fishers to seabed that contains buried subsea cables offered by different operators. [I03] indicated *"once the cable's installed and buried, then there shouldn't be any interactions with the fisheries because they can fish over the top of it"*, and offshore wind farm projects conduct overtrawlability surveys to assure fishers the inter-array cables are safe to fish over ([I-13], [I-14], [D-65]). Conversely, the developer for a transmission cable project articulated they *"cannot condone demersal trawling over the proposed cable"* [D-45].

Pre-application engagement with fishers was highlighted as necessary to inform mitigation measures. [I-07], [I10], [I-11] and [I-12] believed early engagement with the fishing industry has improved since the implementation of the national marine plan. The importance of fisheries liaison officers in facilitating engagement was emphasised, but [I-07], [I-11] and [I-13] expressed difficulties in recruiting to these roles. A fisheries liaison officer is employed to represent the developer on fishing issues.

However, capacity to engage was identified as a key barrier, particularly for smaller inshore vessels. [D-52] and [I-10] report resource constraints of small-scale fishers and their associations as a barrier to responding to consultations or attending meetings: "[inshore fishers] *shouldn't be marginalised because we can't be everywhere at the same time."* [I-10]. [I-11] reported fisheries attendees stopped attending because previous meetings did not meet their expectations. [I-10] believed fisheries attendees are outnumbered by project representatives during meetings. Timing, location and awareness were identified as barriers for individual fishers to attend public consultation events ([I-05], [I-10]). As an alternative mode of communication, a developer included project plans as agenda items for meetings organised by a regional inshore fisheries group [D-53]. Interviewees as well as a

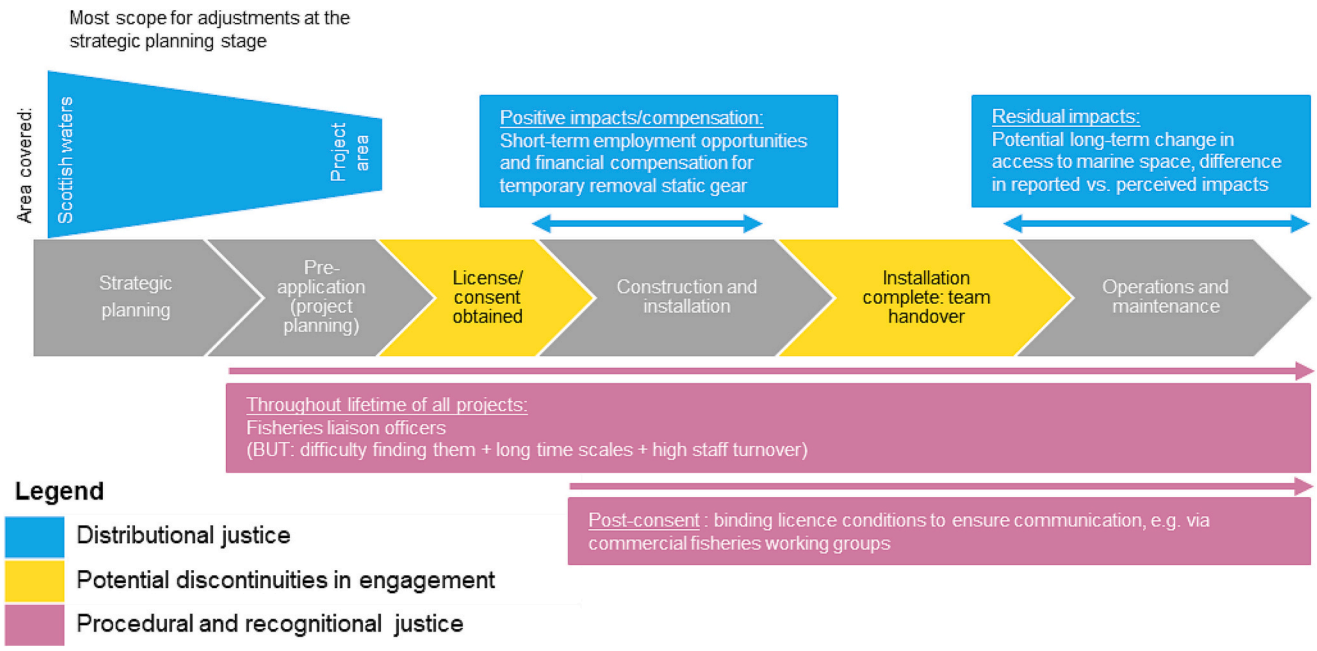

Fig. 5. The arrow-shaped text boxes represent a simplified version of a project lifecycle. Marked in blue are mechanisms identified that affect distributional justice. Marked in yellow are project milestones that influence engagement with the fishing industry as highlighted by interviewees. Pink arrows depict mechanisms currently in place to facilitate procedural and recognitional justice.

consultation response reflected that the regional inshore fisheries groups (RIFGs), which were set up by the government to improve the management of the 0–12 (in some cases 0–6) nautical mile zone, are a potential vehicle to reach many members of the inshore fishing industry, including unaffiliated fishers [I-12], [D-54], [I-04], [I-14], [I-15]. However, despite RIFGs being in place since April 2016, one unaffiliated fisher reported a lack of awareness of the existence of an RIFG in his area of operation [I-06].

[I-14], [I-15] and [I-11] expressed a preference for early and continuous engagement between the energy industry and the fishing industry, but [I-11] highlighted the large time scales between initial project plans and construction works as a barrier to effective continuous engagement. Interviewed representatives from both the cables and fishing industry expressed that on a project level, early dialogue does not necessarily lead to a more meaningful engagement because in the very early stages of the project, cable routes can change significantly due to factors independent of the fishing industry, which can lead to confusion, frustration and engagement fatigue [I-01], [I-03], [I-06]: *"I would say speaking to the right people at the right time. And I don't think early dialogue is necessarily what you need"* [I-03].

In the context of power relations, five interviewees representing fisheries interests ([I-06], [I-07], [I-10], [I-11], [I-14]) highlighted that the expansive trend of renewable energy and cable projects makes the fishing industry feel they are not on an equal footing to the developers: "*the more and more of these projects that are looming the more and more fishing grounds are being lost*" [I-05]. This poses a barrier for the fishing industry to make compromises [I-10].

> *"There's no way to win. There's no way to keep what you're doing right now. And I think if you felt like you were walking into a room on an equal footing with an understanding that you both have to coexist in the area then that would be fine. But I think that the legislation being as it is, it's gonna happen anyway"*. [I-10]

Three fisheries representatives ([I-01], [I-07], [I-11]) believed they had limited influence on the site selection of a development due to the nature of energy infrastructure being of "national importance". [I-05] and [I-07] referred to fisheries being at the bottom of the *"pecking order"*.

4.4. Secondary mitigation

Results related to secondary mitigation measures are subdivided into two sections according to themes identified during the analysis: the role of licence conditions and of continuous communication.

4.4.1. Role of licence conditions

Whereas primary mitigation measures are embedded in the project siting and design phase, secondary mitigation measures may be imposed as licence conditions, and aim to minimise/reduce the effects of anticipated impacts. In two case studies, fishing representatives lifted their objections to the project once they agreed with the licence conditions ([D-56], [D-57]).

For wind farm projects and transmission cable projects, binding licence conditions have been put in place that require the developer to outline a strategy for fisheries liaison, for example a Fisheries Management and Mitigation Strategy (FMMS) that *"contains a statement by the developers to promote coexistence between the two sectors"* and *"lays out the strategy for fisheries mitigation"* [I-15]. For offshore wind projects, licence conditions also required a formal commitment to engage in a 'Commercial Fisheries Working Group' (CFWG), which "*will facilitate ongoing dialogue throughout the pre-construction, construction and operational phases of the Wind Farm*" [D-65] between *"developers and the relevant fishing interests"* [I-15]. [I-15] stated that documents such as the FMMS are reviewed during these meetings, and CFWGs were perceived positively by a fisheries representative: *"it's good that we have people around that table now"* [I-10]. The terms of reference as well as the role of government in chairing these sessions were highlighted by both fisheries and renewable energy representatives as helpful to avoid a potential imbalance in representation of the two industries, including different fisheries segments [I-10], [I-13]. An interviewee from the renewables industry iterated that more informal smaller-scale meetings with the fishing industry on a regular basis are an essential complement to these commercial fisheries working group meetings to maintain positive relationships, as binding actions could be decided on at formal meetings but discussed beforehand at informal meetings [I-13]. For offshore wind farms, overtrawlability surveys have been included as a licence condition to assure fishers the installed inter-array cables in offshore wind

Table 3
Overview of findings per mitigation level and per justice dimension, across the case studies.

	Distributive	Procedural	Recognitional
Positive impacts	Employment opportunities (but short-term)	–	Not all vessels eligible
Primary mitigation	Both spatial and design measures can avoid impacts on fisheries, but discrepancy between projects on how access for fishers of seabed containing buried cables is perceived	Fisheries inputs have led to changes in the location and design of projects, but fishers feel they are on unequal footing with developers due to national energy targets, and there is a perceived disregard of local fisheries knowledge	Not all members of the fishing industry have enough resources to adequately engage with energy industry
Secondary mitigation	Binding licence conditions attached to an issued licence that protect fishing interests led to fisheries bodies lifting their objections	Licence conditions obligate fisheries liaison by the developer, e.g. in the form of employing fisheries liaison officers or taking part in commercial fisheries working groups	Terms of reference to ensure participation of different fisheries segments
Residual impacts	Differences between reported significant impacts in environmental statements and perceived impacts by the fishing industry (e.g. barriers to returning to wind farms)	–	–
Compensation	Financial compensation for the temporal removal of static gear, and propositions for community benefit measures	Difficulties in defining fisheries communities for project area	Difficulties in defining fisheries communities for project area

farms are overtrawlable [D-65].

4.4.2. Changes in communication during project development

Three fisheries representatives ([I-10], [I-11], [I-14]) pointed to a perceived change in power relations once the developer had obtained a licence, as well as a reduced level of engagement. [I-11], [I-13] and [I-15] attributed this change to the structure of energy companies: separate teams within the same company may be responsible for different project phases. Maintaining engagement with the fishing industry whilst handing over a project to a different team was identified as challenging [I15], and an interviewed energy industry representative is investigating how a *"less siloed approach"* can be adapted in the future [I-13]. Representatives from both the energy and fishing industries ([I-10], [I-11], [I-13]) believed this change in staff prevents the trust established at the beginning of a project to be carried through to subsequent phases, hampering continuous engagement.

4.5. Residual negative impacts

Only 3/23 projects (all three of them wind farms) predicted significant residual negative impacts on access to fishing grounds. For another wind farm project, no significant residual effects on access were predicted as "*existing legislation does not prohibit fishing activity from resuming within operational wind farm sites*" [D-66]. Yet [I-12] and [I-14] highlighted insurance, liability and safety concerns are preventing fishers from returning to wind farms. Even though it was not included as a significant effect, exposed or rock protected cables were perceived by [I-01], [I-10] and [I-14] as a snagging risk.

4.6. Compensation

Payments were issued when project works required the temporary removal of static gear [D-10], [D-9], [D-15]. Wind and tidal projects have proposed stock improvements, port enhancements and training as compensatory measures. However, for [I-07], training for alternative employment fails to recognise *"isles-based sea skills and prosecuting your raw resources around your isles"*. To avoid underrepresenting indirectly affected vessels, [I-07], [I-09], [I-10] and [I-11] favoured community-wide initiatives over individual payments. This view was not supported by all interviewees – [I-06] did not feel his interests were represented by the active fisheries association in the area and preferred being individually compensated. Moreover, an ambiguity of 'fishing communities' was highlighted: *"you can identify discrete boundaries as an island… But I know that it's much more complicated once you go to the mainland of Scotland"* [I-07].

5. Discussion

Existing users, such as fisheries, being squeezed out of the marine space as a consequence of the emergence of renewable energy and cable developments, is a risk of global concern, and needs to be taken into consideration when evaluating what a just transition entails [70]. Here we have shown the need to address interactions between renewable energy and fisheries by the three justice dimensions and by each project phase, as existing mechanisms may not address current justice barriers. Findings within this study indicate that each stage of mitigation poses different challenges and opportunities to facilitate a just transition and have different implications for different fisheries segments.

5.1. Distributional justice

The ability of developers to maximise distributional justice for the fishing industry, for example through siting decisions, depends on higher level decision making, such as planning policies in place and strategic siting guidance, and the sectoral marine plan for offshore wind has made efforts to avoid high value fishing areas [30,31]. However, national policy can also hinder the perception of distributional justice. For example, national targets for renewable energy generation can create the perception for fishers that the fishing industry is not on equal footing with the renewables sector, as an equivalent quantitative time-bound target (i.e. equivalent to the target to install 11 GW of offshore wind in Scottish waters by 2030, [71]) does not currently exist for the fisheries sector (e.g. no identified actions of Scotland's fisheries management strategy are time-bound, [72]). Renewable energy installations and cables may take priority over other marine uses as they can be classified as critical national infrastructure and in the case of renewable energy are supported by national production targets [73]. National policies or targets such as these can create a sense of injustice, a finding which may be overlooked at policy level if a conventional policy mechanism such as a cost-benefit analysis is used instead of the two-part framework developed here [74].

This study revealed an apparent disconnect between perceived impacts of energy projects by the fishing industry and reported impacts in the environmental statements/appraisals of the case studies. Concerns regarding safety and liability for cable damage during a snagging incident have also been confirmed in previous UK studies [8,75,76]. The

way affected people perceive and judge an intervention has been termed 'sense of justice' in other work [77]. This aspect of justice cannot be overlooked, and perceived injustices, as well as material deprivation, contribute to social struggle as defined by [78].

Within this study there were also differing perceptions on the level of acceptance towards demersal trawling over cables. The 1884 Convention for the Protection of Submarine Telegraph Cables (applies outside territorial waters) and the 1958 Convention on the High Seas consider "breaking or injury of a submarine cable" a "punishable offence", as implemented in UK waters under the 1885 UK Submarine Telegraph Act and the UK 1964 Continental Shelf Act (applies in UK territorial waters and the Exclusive Economic Zone (EEZ)) [79–82]. The European Subsea Cables Association (ESCA) recommends "vessels should avoid any such activity [including fishing] at a minimum distance of 0.25 nautical mile" from a subsea cable [83]. Despite this recommendation, within wind farms, project developers are carrying out overtrawlability trials to encourage fishers to resume their fishing activities within the wind farm site. If the ambiguity on access to fishing vessels to areas where subsea cables are installed is not addressed, there is a risk that the impact assessment process will misidentify impacts and that fishing vessels will be excluded from wind farm sites due to insurance and liability concerns regarding cable damage [84].

Specifically for renewable energy projects, a revised guidance document by the Fishing Liaison with Offshore Wind and Wet Renewables (FLOWW) group that is currently being drafted has compiled the positions of ESCA and of UK fisheries federations to improve communication on this issue [85]. Different approaches are taken by different sectors operating cables. Issues around loss of access will need to be treated differently for different types of cable projects, offshore wind farms and tidal energy sites, and will also depend on the type of fishing that takes place.

Explicitly comparing positive impacts with residual negative impacts highlighted a potential mismatch in timing and timescales, hindering the possibility of the negative impacts being offset by the positive impacts. Employment opportunities were mostly available in the construction phase of a project, whilst permanent changes to access due to a project were more long-term in nature. Long-term positive impacts were not explicitly identified in this study, whilst perceived long-term negative impacts were identified in the case studies and the interviews. However, this comparison does not consider indirect positive impacts such as improvements in infrastructure and reduction in the reliance on fossil fuels for electricity production. Also, research is currently being conducted on the effects of offshore wind farms on fish stocks [86]. For example, increases in catch rate of plaice around the edges of wind farms in the Belgian part of the North Sea have been reported, demonstrating that new habitats formed by wind farms can be beneficial for target species and result in novel fishing opportunities for vessels [87]. Therefore, positive impacts could benefit certain fisheries, but there is still greater uncertainty around the prediction of these benefits compared to the prediction of negative impacts.

At the post consent stage, measures imposed by the licensing authorities help to facilitate a just transition for the fishing industry. An instrument that was found to be important for guaranteeing the implementation of proposed mitigation measures and overcoming objections to the case studies, was agreed-upon binding licence conditions. However, the licence conditions that have been identified in this study mostly concern procedural justice. Indirectly, this can also improve distributional justice, but the mitigation measures included as licence conditions did not specify any measures that could directly improve distributional justice. A review of existing practices by the Seaplan project include similar findings: 29 tools were identified that could aid mitigation of impacts, and only 11 tools to aid avoidance of impacts [88]. This indicates that the capacity to maximise distributional justice for the fishing industry is greatest at the earlier strategic and project planning phases before a licence is obtained, as suggested by other publications [12,40,89].

5.2. Procedural and recognitional justice

Four main themes are used to structure the findings related to procedural and recognitional justice, related to 1) employment opportunities, 2) consideration of fisheries during project siting and design, 3) how different channels of communication were used and 4) commercial fisheries working groups.

5.2.1. Employment opportunities

The specific crew and vessels requirements needed to access guard vessel opportunities can exclude segments of the fleet, indicating a barrier to recognitional justice, as established by other studies in Scotland and Ireland [6,90]. This study adds a temporal dimension to this, in that the need for fishing vessels for guard vessel work might coincide with optimal fishing conditions. Improvements to accessing opportunities could be facilitated by government-funded projects, such as the performance review of work boats based in Orkney to support marine renewable operations [91].

Employment opportunities may not necessarily be allocated to vessels that will be affected by the project works. To align affected vessels with employment opportunities and facilitate distributive justice, a study in Ireland suggested programmes that link affected vessels with employment opportunities [90]. National-level fisheries organisations that organise guard vessel work can coordinate guard vessel work allocation within their membership. Notably, this could result in a difference in access to guard work opportunities between members and non-members, indicating recognitional justice concerns.

5.2.2. Consideration of fisheries during the siting and design of projects

Opportunities for meaningful participation in the decision-making process by the fishing industry, indicating procedural justice, has led to improvements in distributional justice (avoidance of impacts), through adaptations made by developers to the siting and design of a project (primary mitigation). However, a frustration that was repeatedly voiced by fishers and their representatives is the lack of regard by developers of fisheries knowledge of an area. The integration of local knowledge into decision making has been identified as a key component for procedural justice in the energy transition, especially the knowledge of communities that depend heavily on the ecosystems that host them, such as for fishing [5].

Difficulties in collecting and using local fisheries knowledge have been previously identified [6]. This was overcome for a wind farm project on the East Coast of the U.S. by involving a local community development organisation, who compiled and translated local fisheries knowledge. This increased accessibility and credibility of the information for developers [92]. If considered at an early phase before expensive surveys are carried out for a project, it could also be cost effective for the developer. For a recent floating wind project, fishers recommended a route for the export cable that also reduced risk for the developer [93]. These two examples illustrate instances where fisheries knowledge has been integrated into project planning, in combination with empirical data collected by the developer, but views from the interviewees indicate this is not yet common practice.

As well as fisheries knowledge, an aspect not considered in this study is the availability of data characterising fisheries space use, which also has implications for procedural justice, as well as recognitional justice if there is an imbalance of data availability for different fleet segments. A recent review has highlighted the sparsity of information on inshore fishing vessels as a shortcoming, and efforts are being made to address this shortcoming through participatory mapping initiatives undertaken both at a project level and by government [84,94,95]. As the existing literature supports [43,96,97], interviewees emphasised that engagement with the fishing industry at the earliest possible stage is more effective, and the findings of this study suggest that effective early engagement is becoming more commonplace. However, uncertainty at early stages of planning at the project level hindered meaningful early

engagement. This uncertainty could be another reason integrating fisheries knowledge of the seabed at an early stage is not commonly considered, as it could lead to disappointments if the route advised by fishers is not selected, as siting decisions also depend on fisheries-independent factors.

This study identifies continuous engagement as being equally important to early engagement, which is hampered by the extensive time spans of project planning. The time between the inception of a project and its commissioning took between 5 and 11 years for the analysed case studies. Such considerable time spans can complicate engagement, especially when there is high staff turnover. This poses a barrier to the need for consistent points of contact from both the fisheries and energy industry which was highlighted by a previous study [42,43]. Relationships between the industries sharing the marine space constantly need to be rebuilt, to enable ongoing consideration of procedural justice. This demonstrates how maintaining procedural justice is a long-term commitment, as advancements in achieving procedural justice through specific procedures and mechanisms may become undone later on, due to breaks in engagement as a result of external factors [98].

5.2.3. Different channels of communication

An important mechanism to maintain consistent points of contact between developers and the fishing industry are fisheries liaison officers (FLOs), and previous research has demonstrated a locally-based liaison or third party can function as a bridge between developers and members of the community, fostering effective communication and trust [14,42,43,92,99,100]. This can enhance procedural justice in the planning process. However, difficulties in recruiting locally for these roles were highlighted by interviewees, which can pose a challenge in the future with more upcoming projects in more areas.

Recognitional justice concerns included the lack of resources for smaller boats and associations to respond to consultation requests or attend meetings. Mechanisms identified that can overcome this recognitional injustice include offering potentially affected members of the fishing industry multiple ways to engage, such as the initiative of energy industry representatives attending as a guest to fisheries meetings. This was also suggested as a strategy by a fisheries representative during an international workshop on fisheries interactions with offshore wind energy developments [101]. It could overcome perceived power imbalances which have been identified as barriers to achieving energy justice, for example by Goddard & Farrelly [102].

5.2.4. Commercial fisheries working groups

This study highlights that commercial fisheries working groups have the potential to facilitate both procedural and recognitional justice aspects of the energy transition, as an agreed upon terms of reference could ensure recognitional justice by stipulating who is to be included in these meetings. However, this is a licence condition that is only binding once the developer has obtained a licence, and it has been found that the obtainment by a developer of a licence can change power relations. This was also a finding of a study focusing on interactions between fisheries and offshore wind farms in Scotland and Germany: there is the perception that post consent, the developer has an unfair advantage, putting the two industries on an unequal footing [103]. Schupp et al. suggest an earlier implementation of the commercial fisheries mitigation and management strategy before the licence is obtained [103]. An earlier formal agreement on necessary mitigation measures, could take the form of a “statement of common ground” between developers and the potentially impacted fishers (e.g. [104]), which can help to overcome power imbalances [40,89].

The combination of informal meetings to discuss measures, with formal meetings where decisions are made has been identified as a successful mechanism to build up trust in the process, and it recognises that a combination of formal and informal interactions are necessary to maintain participation in the process, as demonstrated in previous studies [99,105,106].

5.3. Fisheries are not one collective body

This study highlighted disagreement as to whether individual compensation is preferrable over group compensation. This raises recognitional issues in relation to who the recipients of justice/injustice are and whether they identify themselves as one collective, something that may be overlooked. The study probes how Fraser’s ‘participatory parity’ can be reached [58], as barriers were also identified in relation to how subcommunities within Scottish fisheries can be identified, and how individuals who are not part of associations need to be considered as well. This in part is being addressed through the regional inshore fisheries groups network, but concerns have been raised regarding a lack of resources for this network to be able to actively engage in planning processes [36,107].

5.4. Reflections on the framework

To the authors’ knowledge, this study is a first attempt to link the consideration of fisheries in project planning explicitly to how it affects energy justice, using a framework developed for that purpose. Combining dimensions of energy justice with the mitigation hierarchy steps allowed a systematic analysis of multiple perspectives on mechanisms and barriers in place to promote a successful coexistence between a traditional and an emerging blue economy sector. During strategic decision-making processes such as marine spatial planning, the need to take into account the interests of different industries is considered, as well as the need for engagement with the relevant interested parties. The energy justice and mitigation hierarchy framework presented here brings these dimensions together in a more integrated way, which can inform decision makers which issues need to be considered at which project planning phase, to foster energy justice for potentially affected fisheries.

6. Conclusions

Proactive consideration of fisheries is necessary to avoid injustices during the transition towards offshore renewable energy generation, which is taking place across the world. This study presents a framework that can be used to analyse issues as well as inform future decisions specifically in relation to how fisheries, and marine users more broadly, can be taken into account during the planning for renewable energy and cable projects at sea. Socio-economic impacts are represented as different dimensions of an adapted mitigation hierarchy, in combination with the consideration of three dimensions of energy justice. This allows for greater reflection on how impacts and mitigation measures relate to these dimensions of energy justice across a project life cycle.

By applying the framework to analyse renewable energy and cable projects in Scottish waters, it was found that fishers are gaining increased representation, indicating improvements in procedural justice. However, a continuous engagement process from initial project plans through to the operational phase is hampered by breaks in the interaction between individuals from the fishing and renewable energy/cable industries, due to project handover to a different team within an energy company. There is also a perceived lack of consideration of fisher knowledge of the local area, and small-scale fishers risk being underrepresented in the process due to a lack of financial and human resources, jeopardising recognitional justice.

Positive impacts were found to be short-term in nature, and not necessarily accessible to those losing access to their fishing grounds. Facilitating distributive justice is hampered by differing perceptions of what constitutes an impact, as well as the expanding nature of the energy industry. Ambitious renewable energy targets lead to uncertainty on the extent to which additional project developers will ask fishers to share the marine space with them, making it hard to find compromises.

Questions remain as to how this barrier to distributional justice for the fishing industry should be considered within the wider energy justice debate and the transition towards renewable energy, and requires further study, especially as renewable energy targets are being used by governments around the world to mitigate the climate crisis.

The framework presented here, and our findings in our Scottish case studies, will be relevant for other nations that are faced with trade-offs between sectors, and are committed to ensure a just energy transition.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.erss.2023.103135.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

Acknowledgements

This work was funded by the Bryden Centre project, supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB). The views and opinions expressed in this paper do not necessarily reflect those of the European Commission or the Special EU Programmes Body (SEUPB). The project was conducted after ethical approval No OLETHSHE1848 from the University of the Highlands and Islands. The authors would like to thank all the participants in this study, as well as the reviewers for their helpful feedback.

Appendix A. Interview guide across interest groups

Fisheries engagement
Timing/Continuity

1) At what stage in a project are fisheries representatives usually consulted?
2) Do you think impacts can be avoided through early engagement?
   If yes/no, why?
3) At what stage in a project are members of the fishing industry consulted?
4) How do you choose when to start engaging with potentially affected parties?
5) Are you happy with the communication with fisheries representatives from the onset of a project through to the post-consent construction and operational phase?
6) How do consent conditions including the setup of a commercial fisheries working group play a role in this?

Outreach

7) Is it easy to find the relevant fisheries representatives to consult?
8) What is the role of (umbrella) fishing associations for reaching out to members of the fishing industry?
9) What is the role of consultation events for reaching out to members of the fishing industry?
10) Has it been possible to take all fisheries representatives' views into consideration?

Assessment of impacts and benefits and proposed mitigation measures

11) Do you think there could be any improvements in the mitigation measures proposed that consider fishing communities dependent on fishing?
12) Are you happy with the proposed mitigation measures?
13) Is there an opportunity for employing fishers for guard work/FLO's as a form of mitigation?
14) What is (potentially) the role of fishing associations for coordinating this?

General questions

15) Do you think there might be better ways for the fishing industry and the renewables industry to engage?
16) Do you have any examples of fisheries interactions with offshore energy developments that went particularly well or were particularly unsuccessful?

References

[1] S. Carley, D.M. Konisky, The justice and equity implications of the clean energy transition, Nat. Energy 5 (2020) 569–577, https://doi.org/10.1038/s41560-020-0641-6.
[2] L. Tinker, D. Cobb, A. Bond, M. Cashmore, Impact mitigation in environmental impact assessment: paper promises or the basis of consent conditions? Impact Assess. Proj. Apprais. 23 (2005) 265–280, https://doi.org/10.3152/147154605781765463.
[3] MMO, in: Marine Licence Review. A report produced for the Marine Management Organisation, 2017, p. 2. MMO Project No: 1126.
[4] N. Fraser, Social Justice in the Age of Identity Politics: Redistribution, Recognition, and Participation, Tann. Lect. Hum. Values, Deliv. Stanford Univ., 1996. https://tannerlectures.utah.edu/_resources/documents/a-to-z/f/Fraser98.pdf.
[5] K.E.H. Jenkins, D. McCauley, R. Heffron, H. Stephan, R. Rehner, Energy justice: a conceptual review, energy res, Soc. Sci. 11 (2016) 174–182, https://doi.org/10.1016/j.erss.2015.10.004.
[6] K.A. Alexander, T. Potts, T.A. Wilding, Marine renewable energy and scottish west coast fishers: exploring impacts, opportunities and potential mitigation, OceanCoast. Manag. 75 (2013) 1–10, https://doi.org/10.1016/j.ocecoaman.2013.01.005.
[7] K.A.J. Alexander, T.A. Wilding, J.J. Heymans, Attitudes of Scottish fishers towards marine renewable energy, Mar. Policy 37 (2013) 239–244, https://doi.org/10.1016/j.marpol.2012.05.005.
[8] S. Mackinson, H. Curtis, R. Brown, K. Mctaggart, N. Taylor, S. Neville, S. Rogers, A report on the perceptions of the fishing industry into the potential socio-economic impacts of offshore wind energy developments on their work patterns and income, Lowestoft. https://tethys.pnnl.gov/sites/default/files/publications/Perceptions_of_the_Fishing_Industry_on_Offshore_Wind.pdf, 2006 (accessed March 20, 2019).
[9] APPG on Fisheries, Policy Brief: UK fishing and offshore wind. www.fisheriesappg.org, 2021 (accessed November 15, 2021).
[10] C. Dupont, F. Herpers, C.Le Visage, Recommendations for Positive Interactions Between Offshore Wind Farms and Fisheries, 2020, https://doi.org/10.2826/017304.
[11] F.O.D. Volksgezondheid, Bijlage 3: Acties tot uitvoering van het marien ruimtelijk plan. https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/bijlage_3_acties_tot_uitvoering_van_het_marien_ruimtelijk_plan_mrp_2020.pdf, 2020 (accessed August 27, 2020).
[12] NFFO, in: Can Fisheries Co-exist With Offshore Wind in the Race to Carbon Net Zero?, 2021, pp. 1–6 (accessed November 15, 2021), https://www.nffo.org.uk/can-fisheries-co-exist-with-offshore-wind-in-the-race-to-carbon-net-zero/.

[13] NSAC, NSAC Advice on the Development of Offshore Windfarms and Fisheries Interactions. https://www.nsrac.org/wp-content/uploads/2020/12/08-2021-NSAC-Advice-on-Offshore-Wind-Farms.pdf, 2020 (accessed February 16, 2021).

[14] V. Stelzenmüller, A. Gimpel, J. Letschert, C. Kraan, R. Döring, Research for PECH Committee – Impact of the use of offshore wind and other marine renewables on European fisheries, Brussels. https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652212/IPOL_STU(2020)652212_EN.pdf, 2020 (accessed November 20, 2020).

[15] G.Van Hoey, F. Bastardie, S.N.R. Birchenough, A.De Backer, A.B. Gill, S. de Koning, S. Hodgson, S.Mangi Chai, J. Steenbergen, E. Termeer, S.W.K. van den Burg, N.T. Hintzen, Overview of the Effects of Offshore Wind Farms on Fisheries and Aquaculture, Luxembourg, 2021, https://doi.org/10.2826/63640.

[16] N.J. Bennett, J. Blythe, C.S. White, C. Campero, Blue growth and blue justice: ten risks and solutions for the ocean economy, Mar. Policy 125 (2021), 104387, https://doi.org/10.1016/j.marpol.2020.104387.

[17] T.S. Gray, C. Haggett, D. Bell, Offshore wind farms and commercial fisheries in the UK: a study in stakeholder consultation, Ethics Place Environ. 8 (2005) 127–140, https://doi.org/10.1080/13668790500237013.

[18] S. Jentoft, M. Knol, Marine spatial planning: risk or opportunity for fisheries in the North Sea? Marit. Stud. 12 (2014) 13, https://doi.org/10.1186/2212-9790-12-13.

[19] A. Kafas, P. Donohue, I. Davies, Displacement of existing activities, in: K.L. Yates, C.J.A. Bradshaw (Eds.), Offshore Energy Mar. Spat. Plan, Routledge, New York, New York, USA, 2018, pp. 88–112. https://www.taylorfrancis.com/books/9781315666877/chapters/10.4324/9781315666877-7.

[20] K.L. Yates, D.S. Schoeman, C.J. Klein, Ocean zoning for conservation, fisheries and marine renewable energy: assessing trade-offs and co-location opportunities, J. Environ. Manag. 152 (2015) 201–209, https://doi.org/10.1016/j.jenvman.2015.01.045.

[21] J. Glasson, R. Therivel, A. Chadwick, Introduction to Environmental Impact Assessment, 2nd ed., UCL Press, 1999.

[22] J. Mitchell, Mitigation in environmental assessment-furthering best practice, Environ. Assess. Mag. IEA EARA 5 (1997) 28–29.

[23] J.P.G. Jones, J.W. Bull, D. Roe, J. Baker, V.F. Griffiths, M. Starkey, L.J. Sonter, E. J. Milner-Gulland, Net gain: seeking better outcomes for local people when mitigating biodiversity loss from development, One Earth. 1 (2019) 195–201, https://doi.org/10.1016/j.oneear.2019.09.007.

[24] SHEPD, Submarine Electricity Cables Cost Benefit Analysis Methodology Statement. https://distribution.ssen.co.uk/submarinecables/FAQs/, 2015 (accessed August 6, 2019).

[25] Economic evaluation techniques for the environment, in: J.A. Dixon, M. Hufschmidt (Eds.), A Case Study Workbook, John Hopkins University Press, Baltimore, MD, 1986.

[26] D.W. Pearce, C. Nash, The Social Appraisal of Projects: A Text in Cost-Benefit Analysis, Halsted Press, 1981.

[27] H. Saarikoski, J. Mustajoki, D.N. Barton, D. Geneletti, J. Langemeyer, E. Gomez-Baggethun, M. Marttunen, P. Antunes, H. Keune, R. Santos, Multi-criteria decision analysis and cost-benefit analysis: comparing alternative frameworks for integrated valuation of ecosystem services, Ecosyst. Serv. 22 (2016) 238–249, https://doi.org/10.1016/j.ecoser.2016.10.014.

[28] S. Martino, P. Tett, J.O. Kenter, The interplay between economics, legislative power and social influence examined through a social-ecological framework for marine ecosystems services, Sci. Total Environ. 651 (2019) 1388–1404, https://doi.org/10.1016/j.scitotenv.2018.09.181.

[29] IEMA, in: Delivering Quality Development, 2016, pp. 1–20. https://www.iema.net/assets/newbuild/documents/DeliveringQualityDevelopment.pdf.

[30] Scottish Government, Scotland's National Marine Plan: A Single Framework for Managing Our Seas. www.gov.scot, 2015 (accessed February 4, 2019).

[31] Scottish Government, Sectoral Marine Plan for Offshore Wind Energy. https://www.gov.scot/publications/sectoral-marine-plan-offshore-wind-energy/, 2020 (accessed October 28, 2020).

[32] Scottish Government, Sectoral Marine Plan for Offshore Wind for Innovation and Targeted Oil and Gas Decarbonisation (INTOG): Planning Specification and Context Report. https://marine.gov.scot/sites/default/files/sectoral_marine_plan_for_offshore_wind_for_intog_-_project_spec-context_report_-_confidential_-_23_august_2021_1.pdf, 2021.

[33] FLOWW, Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison. https://www.sff.co.uk/wp-content/uploads/2016/01/FLOWW-Best-Practice-Guidance-for-Offshore-Renewables-Developments-Jan-2014.pdf, 2014 (accessed October 25, 2018).

[34] P.A. English, T.I. Mason, J.T. Backstrom, B.J. Tibbles, A.A. Mackay, M.J. Smith, T. Mitchell, Improving Efficiencies of National Environmental Policy Act Documentation for Offshore Wind Facilities Case Studies Report. https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Renewable-Energy/Improving-Efficiencies-of-National-Environmental.pdf, 2017 (accessed April 6, 2023).

[35] UNPG, UNE ACTIVITÉ UTILE ET RESPONSABLE, RESPECTUEUSE DU MILIEU MARIN ET DE SES ACTIVITÉS. http://www.unpg.fr/wp-content/uploads/dp-unpg-les-granulats-marins-en-france-juin-2019.pdf, 2019.

[36] R.J. Shucksmith, T. Stojanovic, A.M. Slater, I. Withouck, K. Allan, Using marine planning to balance competing demands on the marine environment: International comparisons. https://www.parliament.scot/S5_Environment/GeneralDocuments/ECCLR_MASTS_Report_2020.pdf, 2020 (accessed December 17, 2020).

[37] R.L. Shelmerdine, R.J. Shucksmith, B. Mouat, Fisheries management in the context of shared seas, in: Report for Fisheries Innovation Scotland, project FIS014, NAFC Marine Centre UHI, Shetland, 2017.

[38] FLOWW, FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds. https://www.thecrownestate.co.uk/media/1776/floww-best-practice-guidance-disruption-settlements-and-community-funds.pdf, 2015.

[39] R.E. Blyth-Skyrme, Options and opportunities for marine fisheries mitigation associated with windfarms. Final report for Collaborative Offshore Wind Research Into the Environment contract FISHMITIG09., London. https://tethys.pnnl.gov/sites/default/files/publications/Blyth-Skyrme-2010.pdf, 2010 (accessed May 26, 2019).

[40] M. Bocci, S.J. Sangiuliano, A. Sarretta, J.O. Ansong, B. Buchanan, A. Kafas, M. Caña-Varona, V. Onyango, E. Papaioannou, E. Ramieri, A. Schultz-Zehden, M. F. Schupp, V. Vassilopoulou, M. Vergílio, Multi-use of the sea: a wide array of opportunities from site-specific cases across Europe, PLoS One. 14 (2019), e0215010, https://doi.org/10.1371/journal.pone.0215010.

[41] S.A. Kerr, L. Watts, J. Colton, F. Conway, A.D. Hull, K.R. Johnson, S. Jude, A. Kannen, S. MacDougall, C. McLachlan, T. Potts, J. Vergunst, Establishing an agenda for social studies research in marine renewable energy, Energy Policy 67 (2014) 694–702, https://doi.org/10.1016/j.enpol.2013.11.063.

[42] L.D. Rodwell, J.De Groot, M. Ashley, M. Campbell, A. Linley, Fisheries and Marine Renewable Energy Interactions-Assessment and Mitigation (A summary report on an expert workshop for the Marine Renewable Energy Knowledge Exchange Programme (MREKEP)), York. https://nerc.ukri.org/innovation/activities/energy/offshore/fisheries-report/, 2013 (accessed May 25, 2019).

[43] J. de Groot, M. Campbell, M. Ashley, L. Rodwell, Investigating the co-existence of fisheries and offshore renewable energy in the UK: identification of a mitigation agenda for fishing effort displacement, OceanCoast. Manag. 102 (2014) 7–18, https://doi.org/10.1016/j.ocecoaman.2014.08.013.

[44] A. Schultz-Zehden, I. Lukic, J.Onwona Ansong, S. Altvater, R. Bamlett, A. Barbanti, M. Bocci, B.H. Buck, H. Calado, M.Caña Varona, C. Castellani, D. Depellegrin, M.F. Schupp, A. Kafas, A. Kovacheva, G. Krause, Z. Kyriazi, R. Läkamp, M. Lazić, A. Mourmouris, V. Onyango, E. Papaioannou, E. Przedrzymirska, Joanna Ramieri, S.J. Sangiuliano, I. van de Velde, V. Vassilopoulou, C. Venier, M.H.S. Vergílio, J. Zaucha, B. Buchanan, I. Giannelos, Ocean Multi-Use Action Plan, Edinburgh. https://www.submariner-network.eu/images/news/MUSES_Multi-Use_Action_Plan.pdf, 2018 (accessed October 26, 2018).

[45] E.J. Milner-Gulland, P. Addison, W.N.S. Arlidge, J. Baker, H. Booth, T. Brooks, J. W. Bull, M.J. Burgass, J. Ekstrom, L.V. Fleming, H.M.J. Grub, A. von Hase, M. Hoffmann, J. Hutton, D. Juffe-Bignoli, K. ten Kate, J. Kiesecker, N.F. Kümpel, M. Maron, H.S. Newing, K. Ole-Moiyoi, C. Sinclair, S. Sinclair, M. Starkey, S. N. Stuart, C. Tayleur, J.E.M. Watson, S.O.S.E. zu Ermgassen, Four steps for the Earth: mainstreaming the post-2020 global biodiversity framework, One Earth 4 (2021) 75–87, https://doi.org/10.1016/j.oneear.2020.12.011.

[46] Marine Scotland, Xodus, Developing good practice guidance for assessing fisheries displacement: Good Practice Guidance. https://www.gov.scot/publications/good-practice-guidance-assessing-fisheries-displacement-licensed-marine-activities/, 2022.

[47] Business and Biodiversity Offsets Programme (BBOP), Working for Biodiversity Net Gain: An Overview of the Business and Biodiversity Offsets Programme (BBOP) 2004–2018, Washington, D.C. https://www.forest-trends.org/bbop_pubs/overview2018, 2018.

[48] Rio Tinto, Rio Tinto and Biodiversity: Achieving Results on the Ground, 2008.

[49] D. Mccauley, R.J. Heffron, S.K. Jenkins, Advancing energy justice: the triumvirate of tenets, Int. Energy Law Rev. 32 (2013) 107–116 (accessed October 11, 2021), http://hdl.handle.net/10023/6078.

[50] B.K. Sovacool, Energy & Ethics: Justice and the Global Energy Challenge, Palgrave Macmillan, 2013. https://link.springer.com/content/pdf/.

[51] J. Rawls, Justice as fairness, in: W. Sellars, J. Hospers (Eds.), Readings in Ethical Theory, Prentice-Hall, Englewood Cliffs, 1970, pp. 578–595.

[52] J. Rawls, The basic liberties and their priority, in: J. Rawls, S.M. McMurrin (Eds.), Lib. Equal. Law Sel. Tann. Lect. Moral Philos, University of Utah Press, 1987.

[53] J. Rawls, A Theory of Justice, Revised Edition, Belknap Press, Cambridge, MA, 1999, https://doi.org/10.1007/BF00136652.

[54] R. Dworkin, What is equality ? Part 1: equality of welfare, Philos Public Aff 10 (1981) 185–246. http://www.jstor.org/stable/2264894.

[55] R. Dworkin, What is equality? Part 2: equality of resources, Philos. Public Aff. 10 (1981) 283–345. http://www.jstor.org/stable/2265047.

[56] R. Dworkin, Sovereign Virtue: The Theory and Practice of Equality, Harvard University Press, Cambridge, MA, 2000.

[57] B.K. Sovacool, The Palgrave Handbook of the International Political Economy of Energy, Palgrave Macmillan UK, London, 2016, https://doi.org/10.1057/978-1-137-55631-8.

[58] N. Fraser, Social justice in the age of identity politics: Redistribution, recognition, participation, Berlin. http://hdl.handle.net/10419/44061, 1998.

[59] Scottish Government, Marine (Scotland) Act 2010, n.d. https://www.legislation.gov.uk/asp/2010/5/contents.

[60] U.K. Government, Marine and Coastal Access Act 2009. http://www.legislation.gov.uk/ukpga/2009/23/data.pdf, 2009 (accessed April 8, 2019).

[61] W. Tellis, Application of a case study methodology, Qual. Rep. 3 (1997) 1–17, https://doi.org/10.46743/2160-3715/1997.2015.

[62] R.K. Yin, Case Study Research: Designs and Methods, 3rd edn, SAGE Publications, Thousand Oaks, CA, US, 2003. https://www.worldcat.org/title/case-study-research-design-and-methods/oclc/50866947.

[63] C. Robson, K. McCartan, Real World Research, 4th Editio, Wiley, 2016 (accessed April 30, 2021), https://www.wiley.com/en-gb/9781118745236.
[64] D. Dunstone, Development of spatial information layers for commercial fishing and shellfishing in UK waters to support strategic siting of offshore windfarms. https://www.marinedataexchange.co.uk/details/252/2009-abpmer-cowrie-development-of-spatial-information-layers-for-commercial-fishing-and-shellfishing-in-uk-waters-to-support-strategic-siting-of-offshore-windfarms/packages, 2009 (accessed May 1, 2019).
[65] G. Wright, Regulating marine renewable energy development: a preliminary assessment of UK permitting processes, Underw. Technol. Int. J. Soc. Underw. 32 (2014) 39–50, https://doi.org/10.3723/ut.32.039.
[66] V. Ramos, G. Giannini, T. Calheiros-Cabral, P. Rosa-Santos, F. Taveira-Pinto, Legal framework of marine renewable energy: a review for the Atlantic region of Europe, Renew. Sust. Energ. Rev. 137 (2021), 110608, https://doi.org/10.1016/j.rser.2020.110608.
[67] A.M. O'Hagan, A review of international consenting regimes for marine renewables: are we moving towards better practice?, in: 4th Int. Conf. Ocean Energy, 2012.
[68] A. Bogner, B. Littig, W. Menz, Introduction: expert interviews — an introduction to a new methodological debate, Interview. Expert. (2009) 1–13, https://doi.org/10.1057/9780230244276_1.
[69] R. Edwards, J. Holland, What Is Qualitative Interviewing? Bloomsbury Academic, Edinburgh, 2013 http://eprints.ncrm.ac.uk/3276/.
[70] P.J. Cohen, E.H. Allison, N.L. Andrew, J. Cinner, L.S. Evans, M. Fabinyi, L. R. Garces, S.J. Hall, C.C. Hicks, T.P. Hughes, S. Jentoft, D.J. Mills, R. Masu, E. K. Mbaru, B.D. Ratner, Securing a just space for small-scale fisheries in the blue economy, Front. Mar. Sci. 6 (2019), https://doi.org/10.3389/fmars.2019.00171.
[71] Scottish Government, Offshore Wind Policy Statement. https://www.gov.scot/publications/offshore-wind-policy-statement/, 2020.
[72] Scottish Government, Scotland's Fisheries Management Strategy 2020-2030. https://www.gov.scot/publications/scotlands-future-fisheries-management-strategy-2020-2030/, 2020.
[73] Scottish Government, Keeping Scotland Running, 2020 (accessed April 29, 2021), www.readyscotland.org.
[74] K.E.H. Jenkins, B.K. Sovacool, N. Mouter, N. Hacking, M.-K. Burns, D. McCauley, The methodologies, geographies, and technologies of energy justice: a systematic and comprehensive review, Environ. Res. Lett. 16 (2021), 043009, https://doi.org/10.1088/1748-9326/abd78c.
[75] M. Gray, P.-L. Stromberg, D. Rodmell, Changes to fishing practices around the UK as a result of the development of offshore windfarms –, Phase 1 (2016). https://www.thecrownestate.co.uk/media/502008/ei-changes-to-fishing-practices-around-the-uk-as-a-result-of-the-development-of-offshore-windfarms.pdf.
[76] T.L. Hooper, M. Ashley, M.C. Austen, Perceptions of fishers and developers on the co-location of offshore wind farms and decapod fisheries in the UK, Mar. Policy 61 (2015) 16–22, https://doi.org/10.1016/j.marpol.2015.06.031.
[77] H. Svarstad, A. Sletten, R. Paloniemi, D.N. Barton, M. Grieg-Gran, Three types of environmental justice: From concepts to empirical studies of social impacts of policy instruments for conservation of biodiversity. http://policymix.nina.no, 2011 (accessed June 7, 2021).
[78] M. Bavinck, S. Jentoft, J. Scholtens, Fisheries as social struggle: a reinvigorated social science research agenda, Mar. Policy 94 (2018) 46–52, https://doi.org/10.1016/j.marpol.2018.04.026.
[79] Convention for the Protection of Submarine Telegraph Cables. https://cil.nus.edu.sg/wp-content/uploads/formidable/18/1884-Convention-for-the-Protection-of-Submarine-Telegraph-Cables.pdf, 1884.
[80] U.K. Government, Continental Shelf Act. https://www.legislation.gov.uk/ukpga/1964/29/contents, 1964.
[81] U.K. Government, Submarine Telegraph Act. https://www.legislation.gov.uk/ukpga/Vict/48-49/49/enacted, 1885.
[82] Convention on the High Seas. https://treaties.un.org/doc/Treaties/1963/01/19630103 02-00AM/Ch_XXI_01_2_3_4_5p.pdf, 1958.
[83] ESCA, ESCA Position Statement on vessels operating in the vicinity of subsea cables. https://www.escaeu.org/documents/, 2021.
[84] Marine Scotland &amp, Brown and May Marine, Review of fish and fisheries research to inform ScotMER evidence gaps and future strategic research in the UK. https://www.gov.scot/publications/review-fish-fisheries-research-inform-scotmer-evidence-gaps-future-strategic-research-uk/, 2022.
[85] The Crown Estate, Meeting Notes FLOWW. https://www.thecrownestate.co.uk/en-gb/what-we-do/on-the-seabed/our-partnerships/the-fishing-liaison-with-offshore-wind-and-wet-renewables-group/, 2020.
[86] A. Gill, S. Degraer, A. Lipsky, N. Mavraki, E. Methratta, R. Brabant, Setting the context for offshore wind development effects on fish and fisheries, Oceanography 33 (2020) 118–127, https://doi.org/10.5670/oceanog.2020.411.
[87] A.De Backer, H. Polet, K. Sys, B. Vanelslander, K. Hostens, Fishing activities in and around belgian offshore wind farms : and landings over the period 2006–2017, in: S. Degraer, R. Brabant, B. Rumes, L. Vigin (Eds.), Environ. Impacts Offshore Wind Farms Belgian Part North Sea Marking a Decad. Monit. Res. Innov., Royal Belgian Institute of Natural Sciences, OD Natural Environment, Marine Ecology and Management, Brussels, 2019, pp. 31–46. https://pureportal.ilvo.be/nl/publications/fishing-activities-in-and-around-belgian-offshore-wind-farms-tren.
[88] S. Moura, A. Lipsky, J.M. Morse, Options for Cooperation between Commercial Fishing and Offshore Wind Energy Industries. A Review of Relevant Tools and Best Practices. https://maritime-spatial-planning.ec.europa.eu/practices/review-relevant-tools-and-best-practices, 2015.
[89] A. Kafas, Offshore Wind and Commercial Fisheries in the East Coast of Scotland, Edinburgh. https://muses-project.com/wp-content/uploads/sites/70/2018/02/ANNEX-1-CASE-STUDY-1A.pdf, 2017 (accessed April 8, 2019).
[90] K. Reilly, A.M. O'Hagan, G. Dalton, Developing benefit schemes and financial compensation measures for fishermen impacted by marine renewable energy projects, Energy Policy 97 (2016) 161–170, https://doi.org/10.1016/j.enpol.2016.07.034.
[91] EMEC, Aquatera, Performance Review of Maritime Support Services for Orkney. http://www.emec.org.uk/press-release-orkney-vessel-trials-demonstrate-cost-savings-for-marine-energy/, 2017.
[92] S.C. Klain, T. Satterfield, S. MacDonald, N. Battista, K.M.A. Chan, Will communities "open-up" to offshore wind? Lessons learned from New England islands in the United States, energy resSoc. Sci. 34 (2017) 13–26, https://doi.org/10.1016/j.erss.2017.05.009.
[93] K. Moore, Fishermen seek voice in offshore wind power planning, Workboat. https://www.workboat.com/offshore/fishermen-seek-voice-in-offshore-wind-power-planning, 2019 (accessed March 26, 2021).
[94] B. Mouat, W.J. Doran, P. Tett, R.J. Shucksmith, I. Withouck, Evaluating the current use of fisheries data in siting and impact assessment of offshore energy, in: ICES Annu. Sci. Conf. 2021, 2021, p. 1, https://doi.org/10.13140/RG.2.2.29358.84809.
[95] I. Withouck, The Siting of Renewable Energy Developments in a Crowded Marine Space, University of the Highlands and Islands, 2022.
[96] C. Haggett, T. ten Brink, A. Russell, M. Roach, J. Firestone, T. Dalton, B. McCay, Offshore wind projects and fisheries: conflict and engagement in the United Kingdom and the United States, Oceanography 33 (2020) 38–47, https://doi.org/10.5670/oceanog.2020.404.
[97] A. O'Keeffe, C. Haggett, An investigation into the potential barriers facing the development of offshore wind energy in Scotland: case study – Firth of Forth offshore wind farm, Renew. Sust. Energ. Rev. 16 (2012) 3711–3721, https://doi.org/10.1016/j.rser.2012.03.018.
[98] B.K. Sovacool, M.M. Lipson, R. Chard, Temporality, vulnerability, and energy justice in household low carbon innovations, Energy Policy 128 (2019) 495–504, https://doi.org/10.1016/J.ENPOL.2019.01.010.
[99] J. Dwyer, D. Bidwell, Chains of trust: energy justice, public engagement, and the first offshore wind farm in the United States, Energy Res.Soc. Sci. 47 (2019) 166–176, https://doi.org/10.1016/j.erss.2018.08.019.
[100] Y. Rydin, L. Natarajan, M. Lee, S. Lock, Do local economic interests matter when regulating nationally significant infrastructure? The case of renewable energy infrastructure projects, local econ, J. Local Econ. Policy Unit. 33 (2018) 269–286, https://doi.org/10.1177/0269094218763000.
[101] RODA, Fisheries and Offshore Wind Energy: Synthesis of the Science. https://rodafisheries.org/portfolio/synthesis-of-the-science/, 2020 (accessed April 8, 2019).
[102] G. Goddard, M.A. Farrelly, Just transition management: balancing just outcomes with just processes in Australian renewable energy transitions, Appl. Energy 225 (2018) 110–123, https://doi.org/10.1016/J.APENERGY.2018.05.025.
[103] M.F. Schupp, A. Kafas, B.H. Buck, G. Krause, V. Onyango, V. Stelzenmüller, I. Davies, B.E. Scott, Fishing within offshore wind farms in the North Sea: stakeholder perspectives for multi-use from Scotland and Germany, J. Environ. Manag. 279 (2021), 111762, https://doi.org/10.1016/j.jenvman.2020.111762.
[104] Royal Haskoning, DHV, Norfolk Boreas Offshore Wind Farm Statement of Common Ground Eastern Inshore Fisheries and Conservation Authority (Version 2). https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-001768-NorfolkBoreasStatementofCommonGroundwithEasternInshoreFisheriesandConservationAuthority(Version2).pdf, 2019 (accessed January 21, 2022).
[105] A. Cornwall, Unpacking "participation" models, meanings and practices, Community Dev. J. 43 (2008) 269–283, https://doi.org/10.1093/CDJ/BSN010.
[106] N. Dawson, A. Martin, F. Danielsen, Assessing equity in protected area governance: approaches to promote just and effective conservation, Conserv. Lett. 11 (2018), https://doi.org/10.1111/CONL.12388.
[107] D. Symes, in: Finding Solutions: Resilience Theory and Europe's Small-scale Fisheries, 2014, pp. 23–41, https://doi.org/10.1007/978-94-007-7911-2_2.