



Marine Scotland

Defining 'Local Area' for assessing impact of offshore renewables and other marine developments

Final Report

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Preface

Note on publication

Marine Scotland commissioned Biggar Economics to deliver this project to support the development of principles to inform an appropriate approach for defining the local impact area on land for large industrial developments (such as offshore windfarms) at sea. The report and guidance principles are now being published as part of the evidence base that was used to support the development of Socio-Economic Impact Assessment Guidance for Offshore Renewable Energy ORE (due to be published shortly).

The report provided a useful overview of current practice on defining local impact areas in the UK and Europe based on the literature available at the time. The report offers a useful contribution to the evidence base which has helped to underpin some sections of Socio-Economic Impact Assessment Guidance for Offshore Renewable Energy that Marine Scotland has been developing. It should however be noted that in developing the new guidance, our understanding of the topic has developed, and some of the report's conclusions and terminology are now of limited applicability. We direct the reader to the main guidance document (noted above) as the primary source of guidance and which super-cedes what is presented in this paper.

Some caveats apply to this report:

- 1) Use of the term "local area" is no longer favoured as socio-economic impacts can occur at different geographic levels and the concept of "local" means different things to different people, rendering the term problematic. The main guidance document uses the term "impact area".
- 2) There are a wider range of evidence sources to support the definition of "social" and "economic" impacts than were used in this report. More detailed definitions are set out in the guidance.
- 3) The guidance has introduced a more flexible and iterative approach to the stages of impact assessment reflecting wider literature on socio-economic impact assessment and more recent thinking on the topic.
- 4) The methodology used in this report relies primarily on examples of socio-economic impacts that were used in previous ex-ante impact assessments

and less so on evidence sources that illustrate actual socio-economic impacts. This reflects the limited evidence base at the time the work was conducted and the challenges that there are in accessing data on impacts.

Marine Scotland intends to conduct more research in this area to further strengthen approaches to defining impact areas on land for offshore developments.

While every effort has been made to make this publication accessible to all, some sections may remain inaccessible due to the nature of the content. If you are unable to access any content you require, please contact ScotMER@gov.scot

Marine Scotland, June 2022

1. Introduction

This document is a report for Marine Scotland on a study commissioned to define local areas for assessing socio-economic impacts of offshore developments.

1.1 Study Objectives

The overarching question of this project was ‘How can identification of ‘local’ for socio-economic impacts be standardised for marine development so better comparisons can be made between different development scenarios?’. In particular, this study was concerned with the geographies that are used in socio-economic impact assessments, such as those submitted in Environmental Impact Assessments as part of the planning process.

The research objectives for this project were:

- Review the methodology used to define local areas across different renewables developments and other marine sectors;
- Produce a set of principles for identifying the local area of impact based on review findings and test these using completed or on-going developments as case studies; and
- Provide recommendations on approaches and methodologies on creating local boundaries by developers and decision-makers.

1.2 Study Aims

This research aimed to review current methods of identifying the local footprint for socio-economic impacts and provide recommendations towards standardising how a local area is defined and measured for marine developments.

Specifically, the study aimed to:

- Review current methods for defining local boundaries for assessing the socio-economic impacts of marine developments. The review will focus on renewable

energy, but draw on knowledge and information from other marine sectors that have more experience in defining these regions; and

- Develop and test principles for defining the local area of impact of marine developments to underpin future standardisation.

The scope of this study is to consider the impacts that an offshore development will have onshore and to define geographies for considering these impacts in such a way that is consistent, comparable and practical. In particular, the study considers the approaches taken to socio-economic impact assessments for projects, which are normally considered as part of the Environmental Impact Assessment or as an addendum to a planning application.

1.3 Report Structure

The rest of the report is structured as follows:

- Section 2 is an executive summary of the process and findings of this study;
- Section 3 is a review of the existing evidence and policy regarding local areas of socio-economic impact for offshore developments;
- Section 4 discusses and analyses the case studies that were considered as part of this study;
- Section 5 describes the stakeholder consultation exercise and the lessons learned from this process; and
- Section 6 outlines the principles for defining local areas for offshore developments.

In addition to this report, a Guidance Document was also produced. This document describes in more detail how the principles can be used to define local areas for offshore developments, including worked examples.

2. Executive Summary

The socio-economic impact of offshore developments on local areas is a topic of interest for people who live in these areas, for developers and for public sector agencies. However, defining what is local to a development that could be many miles out at sea is a challenge for all stakeholders. This study has looked at this issue and defined principles through which local areas can be defined.

This study and the attempt to define local areas for the assessment of socio-economic impacts of offshore developments is the first of its kind. Previous attempts to define supply chain geographies have focussed on the availability of industrial expertise, rather than in relation to areas local to any given development. Policies that do exist to describe geographies local to offshore developments do so solely based on a radius from the site and are used to allocate defined benefits, such as taxes or community funding. Therefore, there are no domestic or international examples of describing areas local to an offshore development for socio-economic impact assessments.

The variation in approaches to socio-economic impact assessments that are currently used is highlighted by the case studies which were chosen as part of this analysis. The six case studies covered offshore wind, aquaculture and tidal power. All studies considered the direct employment that was supported by these projects. However, the inclusion of other impacts, either economic or social, varied widely between studies. Partly as a result of the different impacts included, the local areas that were covered in these studies ranged from individual coastal villages to half the landmass of Scotland.

The case study analysis and consultations highlighted a number of issues, which would need to be considered by any principles used to define local areas. In particular these were:

- **perceptions** - the perception of what is local is often considered by stakeholders based on the visible changes, either in activity or appearance. Therefore, a site which would experience a significant impact is less likely to be considered local if this impact reflects a continuation of current activity rather than a site which experienced a smaller level of impact from new activity.
- **timeframe** - socio-economic impact assessments are typically carried out many years before construction activity starts, particularly those that form part of the large project Environmental Impact Assessments. As a result, important properties of the projects may not have been finalised at time of study;
- **use of studies** - the primary use of the majority of socio-economic impact assessments was to inform planning decisions. Beyond that the majority of stakeholders did not use these studies although they had been used to promote accountability and encourage supply chain participation; and
- **appropriate groupings** - the list of impacts that can be considered in socio-economic impact assessments is large and the assessment of them all at the same level can be restrictive. For example, it is unlikely that any geography in which economic multiplier effects can be considered would result in recreational impacts being significant.

The principles were identified using the findings of the consultation programme and case study analysis. These principles can be used to define local areas based on pre-existing geographies that contain the epicentres of impact. The principles are:

- **Principle 1 (Dual Geographies)** - The local area for the supply chain and investment impacts should be separate from the local area(s) for wider socio-economic impacts;
- **Principle 2 (Appropriate Impacts)** - The appropriate impacts to be considered for assessments should be identified prior to defining the local areas;
- **Principle 3 (Epicentres)** - The local areas should include all the epicentres of the appropriate impacts;
- **Principle 4 (Accountability)** - The local areas used in the assessment should comprise of pre-existing economic or political geographies (community councils, local authorities, development agencies) to enhance accountability;

- **Principle 5 (Understandable)** - The local areas should be defined in such a way that they are understandable to the communities they describe; and
- **Principle 6 (Connected Geography)** - The local area for the supply chain and investment impacts should consist of connected (including coastal) pre-existing economic or political geographies.

When these principles are applied to the selection of local areas for socio-economic impact assessments the resulting geographies will be both understandable and defensible and the process shall be transparent.

3. Existing evidence

This section considers previous studies and existing policies which consider what socio-economic impacts offshore developments have been in communities and where these impacts occur.

3.1 Literature Review of Offshore Socio-Economic Impacts

The social and economic impact of offshore developments has been the subject of academic and industrial study in recent years. Some of these studies are of particular developments and the views of local communities of these developments and other studies have a more general approach. This section focusses on the following studies:

- Collingwood Environmental Planning (2022) A two way conversation with the People of Scotland on the Social Impact of Offshore Renewables;
- Howell, Rhys (2018) In sight and in mind: social implications of marine renewable energy;
- IronsideFarrar (2012) Tiree Onshore Scenario Mapping – Final Report;
- Marine Scotland (2013) Planning Scotland’s Seas: The Scottish Marine Protected Area Project – Developing the Evidence Base for Impact Assessments and the Sustainability Appraisal; and
- Rudolph et al (2017) Community benefits from offshore renewables: The relationship between different understandings of impact, community and benefit.

3.1.1 Marine Scotland’s areas of impact

In Planning Scotland’s Seas¹, Marine Scotland identifies seven areas of social impact that should be considered in the impact assessments. These are outlined in Table 3-1, which also outlines the changes and experiences on these key areas that would constitute an impact. For example, if an offshore development resulted in a

¹ Marine Scotland (2013) Planning Scotland’s Seas: The Scottish Marine Protected Area Project – Developing the Evidence Base for Impact Assessments and the Sustainability Appraisal

change in the level of crime in an area (either perceived or actual) this would be considered a social impact resulting from the development.

Table 3-1: Definitions of areas of social impact

Key Area	Access	Experience
Access to services	Change in opportunity to use services or time to access services	Change in quality of service provided or received
Crime	Change in opportunity for criminal activities	Change in level of crime (perceived or actual)
Culture and heritage	Change in opportunity to access culture and heritage	Change in quality of cultural or heritage through change in context, quality of visits
	Change in existence of culture/heritage, or knowledge of it (especially loss)	
	Change in number of visits to cultural/heritage sites	
Education	Change in opportunity to access education services	Change in quality of education services
Employment	Change in employment opportunities	Change in quality of employment opportunities
Environment	Change in opportunity to access environment	Change in quality of environment through change in quality of habitats, species supported or change in quality of visits
	Change in existence of environment, or knowledge of it (especially change in habitats)	
	Change in number of visits to environmental sites	
Health	Change in level of disease or symptoms (physical and mental health)	Change in self-assessed quality of health

Source: Marine Scotland (2013) Planning Scotland's Seas: The Scottish Marine Protected Area Project – Developing the Evidence Base for Impact Assessments and the Sustainability Appraisal

3.1.2 Public Perceptions of Impact

In addition to the impacts identified in the Scottish Marine Protected Area project, studies have also been undertaken that have considered the public's perception of what the impacts of offshore renewables could have on them.

The most recent study in this area is an in-depth analysis of Scottish community perspectives about offshore renewables. This was sponsored by Marine Scotland and Sciencewise in 2016².

The central focus of this project was to develop a better understanding of the things that members of the public value in their lives and how these might be impacted, positively or negatively, by the development of offshore renewables. The project ran two rounds of dialogue and explored how potential impacts might be better identified and assessed, and developed a conceptual framework on social values for assessing the potential social impacts of offshore renewables plans.

Clusters of social values emerged from the dialogue. These represent things that are important to people's daily lives that could be affected by development and are described in Table 3-2.

Table 3-2 Clusters of Social Values

Value Cluster Levels	Value Clusters
Individual	<ul style="list-style-type: none">• Way of life: Family/family life/ intergenerational issues• Way of Life: Jobs/career/employment• Way of life: Money/cost of living
Community	<ul style="list-style-type: none">• Community: Local jobs/local industry/community sustainability• Community: Transport connections/ technology connections• Community: Education• Community: Healthcare• Community; shops/housing• Community: socialising/ recreation/ parks/ leisure

² A two way conversation with the people of Scotland on the social impact of offshore renewables, Collingwood Environmental Planning Limited in partnership with Pidgin Perfect, Nereus Environmental and University of Strathclyde 2022; Scottish Government.

Value Cluster Levels	Value Clusters
	<ul style="list-style-type: none"> • Community: Friends/being involved/ supporting others • Community: local identity/ Cultural heritage/ Gaelic • Local environment: connection to nature/ landscape • Local Political and decision-making systems
Wider political and environmental context	<ul style="list-style-type: none"> • Environment: landscape/ seascape/ wildlife/ environmental change • National and EU level political decision-making systems

Source: A two way conversation with the people of Scotland on the social impact of offshore renewables, Collingwood Environmental Planning Limited in partnership with Pidgin Perfect, Nereus Environmental and University of Strathclyde 2022; Scottish Government.

The social value clusters that might be affected by offshore renewables were identified as:

- Local jobs, industry and community sustainability: mixed opinions – positive and negative;
- Transport and technology connections: generally positive but some negative;
- Environmental change: generally negative but some positive; and
- Political and decision-making systems: mixed opinions – positive and negative.

Similarly, other studies have also highlighted a wide range of perceived and actual social impacts from offshore renewable developments. Public consultations on the proposed Tiree Array³ with residents of the Isle of Tiree highlighted a broad range of concerns and opportunities that the residents associated with the development. These included concerns over house prices, dilution of Gaelic language, and transport capacity in addition to optimism on what this development could mean for the demographic and economic sustainability of a relatively fragile island community.

Studies on the Isle of Lewis⁴ have also found that there is a significant range of social impacts that could result from an offshore renewable energy development. This study also highlighted some of the issues regarding the perception of these

³ IronsideFarrar (2012) Tiree Onshore Scenario Mapping – Final Report

⁴ Howell, Rhys (2018) In sight and in mind: social implications of marine renewable energy

impacts. For example, on the potential impact that an offshore renewable energy development could have on the Gaelic language, some participants stated that they felt that this development would have negative impacts on the language as new people arriving on the island to work would dilute the incidence of Gaelic being spoken on the island. Others disagreed, and said that attracting new younger people to the island, who may become Gaelic speakers, was required to support the ageing Gaelic speaking population on the island.

In both studies of the island communities, one of the key social impacts was the sense of control and ownership over the island and surrounding seas. The roles of governance, collaboration and co-development are highlighted as important tools in mitigating negative social impacts. This requires a proactive approach from developers, but also governance structures within the communities that can actively engage with the process.

There is also the perception that communities local to the development of an offshore renewable energy site, or supporting infrastructure, are most likely to experience any negative impacts associated with the site⁵. In particular, any social impacts associated with visual amenity shall only be experienced by those within a certain radius from which the infrastructure is directly visible. The study on community benefits considered the reasons why the funds are put in place. Of the five justifications given for local community benefit to be included as part of an offshore renewable energy development, three of these relate to the mitigation of negative socio-economic impacts.

3.1.3 Summary of Literature

The literature on the topic of social and economic impacts associated with offshore developments identifies a wide range of potential impacts including those which are visible and quantifiable and those which are perceptible and more difficult to assess.

The scope of this study was to consider the impacts that an offshore development will have onshore and to define geographies for considering these impacts in such a way that is consistent, comparable and practical. In particular, the study considers

⁵ Rudolph et al (2017) Community benefits from offshore renewables: The relationship between different understandings of impact, community and benefit.

the approaches taken to socio-economic impact assessments for projects, which are normally considered as part of the Environmental Impact Assessment or as an addendum to a planning application.

Only some of the socio-economic impacts outlined in Table 3-1 are usually taken into consideration as part of the Environmental Impact Assessment process. The impacts that are typically included as part of these studies are:

- Employment – in particular the changes in employment and resulting GVA supported by the development; and
- Culture and heritage – in particular change in access and usage of tourism and recreation assets.

Other areas of social impact may occasionally be included in these socio-economic impact assessments. These are only included if they have effects that will impact on the socio-economic impacts that are scoped into these studies. For example, the visual amenity of an offshore wind farm or onshore substation may be considered related to lower usage of tourism or recreation assets. However, when these impacts are assessed as part of a socio-economic impact assessment it is necessary to look at the end result, rather than intermediary factors. Therefore, if evidence suggests that perceived changes in visual amenity do not have an impact on tourism or recreation, these social impacts are not considered negative as part of the socio-economic impact assessment.

3.2 Current Practice in Identifying Local Areas

Different countries and industries take different approaches to considering the onshore impacts of offshore developments. Similarly, onshore organisations have defined economic geographies in which the impacts of offshore developments are considered and supported. This section considers the current approaches to defining these geographies.

This section does not consider the current approach to defining local areas for assessing the socio-economic impact of offshore developments in Scotland. This shall be considered in more detail in the Case Study analysis.

3.2.1 International Approaches

As part of the background research into this topic BiGGAR Economics considered the approaches taken by other developed countries within the Organisation for Economic Co-operation and Development (OECD). Policy documents for the relevant planning and licencing authorities in each OECD country were reviewed to identify any systematic approach taken to defining local areas for assessment.

Analysis of approaches taken in OECD countries found that no country had a systematic approach to defining local areas for assessment of offshore developments

While there were no systematic approaches to defining the areas for assessment for the offshore developments, some countries have systematic approaches to defining areas of benefit. This benefit can be in the form of community ownership options, municipal taxation or community benefit funding. The systematic approaches to defining these areas operate in Denmark and France, and more details of these are given below.

Denmark

In Denmark, the Danish Energy Agency is the authority in charge of offshore developments. In the case of offshore wind farm developments, Danish law incorporates an obligation for developers to offer the local population participation in a co-ownership scheme of at least 20% of the development's total costs⁶. The initiative aimed at increasing local support for near-shore developments applies to those projects located within 16km from the coastline where a tender procedure has not been followed. The potential beneficiaries from the scheme are defined as those aged 18 or over registered with a permanent address in municipalities with a coastline within 16km from the wind farm.

⁶ Roberts, J, Bodman, F and Rybski, R (2014). Community Power: Model Legal Frameworks for Citizen-owned Renewable Energy. (ClientEarth: London)

Vesterhav Syd and Nord Offshore Wind Farms



Offshore Wind, Fixed.

Vesterhav Syd and Nord Offshore Wind Farms have a combined capacity of 344 MW and are owned by the Swedish power company Vattenfall. The total investment for these projects, and the Kriegers Flak Offshore Wind Farm, will be €1.6 billion⁷. The two wind farms are expected to be able to meet the electricity demand of around 380,000 households and to have a capacity factor of up to 52%, making them 10% more productive than existing wind farms. Grid connection was possible since the two developments are located close to the coast, between 4.2km and 10km off the west coast of Denmark, in the West Jutland region.

Given the wind farms' proximity to the coastline, developers have a legal obligation to offer at least a 20% stake in the project to the local communities affected. This will be the first time the scheme will apply to an offshore wind farm. The municipalities likely to be affected by the scheme are Lemvig, Holstebro and Ringkøbing-Skjern and are shown in the map opposite.

France

In France, the tax code defines which local areas are the recipients of tax revenue from offshore wind developments. This provides another way in which a local area can be identified. Producers are taxed 15,094 €/MW and 50% of these tax receipts go to those municipalities that are in the sight line of the installation⁸. Receipts are then distributed proportionately depending on the visual impact of the development.

⁷ Vattenfall (2019) Year End Report 2018

⁸ SIMCELT (2016) Offshore Wind: Maritime Sector Briefing

The visibility criteria ensure that the support is very localised. For example, the Fecamp Wind Farm off the coast of Normandy pays taxation revenues to 17 communities, with the furthest community 22km away from the turbines.

3.2.2 Local Supply Chain Strategy Areas

In addition to the geographies of defined benefit, there are also geographies which are defined based on the supply chain opportunities associated with offshore developments. The supply chain opportunities represent a significantly larger value than the defined taxation of community fund benefits.

The marine sector has different impacts across different areas of England. Therefore, geographies have been defined within England in order to gain a better understanding of these impacts and to focus support for these areas.

This section provides a review of the ways in which local areas are described elsewhere in the UK, with a focus on the marine renewables sector in England. The section does not consider Scottish-only defined geographies to avoid introducing bias in the initial spatial economic analysis. This includes areas defined by national strategies, such as those of the Department of Business, Energy and Industrial Strategy (BEIS), and self-described regions in which a local economic authority has specifically considered the role of marine sectors in the area that they are responsible for.

BEIS Local Energy Strategies

The geographical focus for most energy sector strategic activity in England tends to be the Local Enterprise Partnership areas, feeding into the Local Industrial Strategy.

BEIS has invited all LEPs to develop local energy strategies (part of the Clean Growth Strategy). BEIS has a Local Energy programme to improve the ability of LEPs and local authorities to deliver energy projects. All LEPs have been offered funding to develop an energy strategy. These fall under five local energy hubs, each of which has a wide geographical region, with £4.8m of funding (2018) in the following areas:

- North West (hosted by Liverpool);

- North East, Yorkshire and Humber (Tees Valley lead);
- Midlands (Nottingham lead);
- Greater South East (Greater Cambridge and Peterborough lead); and
- South West (West of England lead).

Centres for Offshore Renewable Energy Engineering (CORE)

In England there are six locations that have been awarded special status as Centres for Offshore Renewable Energy Engineering by the UK Government. CORE status is awarded through recognising the existing port infrastructure, skills, supply chain and local government support to enable rapid growth within the offshore wind sector.

The CORE sites are defined as a group of towns within each region:

- North Eastern CORE – consisting of Newcastle, Sunderland, Blyth, Durham and Northumberland;
- Tees Valley CORE – consisting of Hartlepool, Stockton, Darlington, Middlesbrough and Redcar & Cleveland;
- Humber CORE – consisting of Grimsby, Hull, Immingham;
- Liverpool City Region CORE – consisting of Liverpool, Wirral, Sefton, Knowsley, St Helens and Halton;
- Great Yarmouth and Lowestoft CORE – Great Yarmouth, Lowestoft, Wells and Beccles; and
- South East CORE – consisting of Kent and Medway (including Thamesport, Sheerness, Ramsgate and Whitstable) and Essex (Harwich and Brightlingsea).

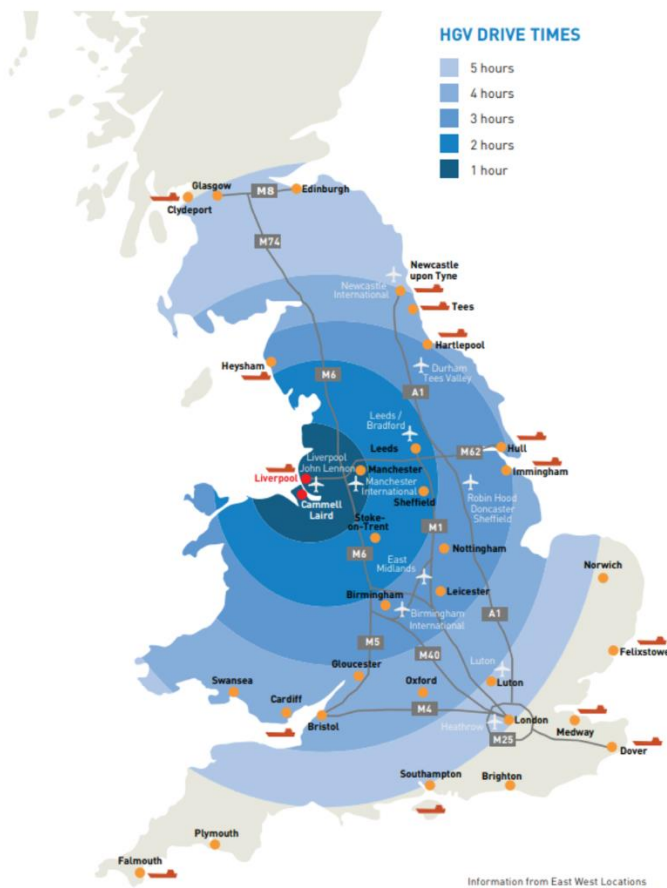
Liverpool City Economic Region

Marine Energy is identified as a growth sector in the Liverpool City Region and is one of the six locations that has been awarded CORE status by the UK Government. The Liverpool City Region covers 724km² that includes 6 local authority districts and a population of 1.5 million.

The geographic focus area of the economic opportunity in the City Region LEP strategy is the area defined as ‘Liverpool Bay and the Southern Irish Sea’⁹. This includes significant offshore wind projects such as Burbo Bank and a live project pipeline with a value in excess of £4.8 billion.

The City Region has a strong supply chain supporting the marine energy sector, from legal and insurance specialists, through marine construction and logistics to specialist systems and equipment manufacturers - there are over 140 companies active in the sector.

Figure 3-1 HGV Drive Times between Liverpool City Region and Rest of UK



Impact Source: Liverpool City Region (2012) Offshore Wind Energy Hub

⁹ Liverpool City Region LEP, Marine Energy <https://www.liverpoollep.org/growth-sectors/low-carbon/marine-energy/> Liverpool City Region Offshore wind energy hub <https://www.liverpoollep.org/wp-content/uploads/2015/06/wp-id-offshore-wind-energy-hub-04-2012.pdf>

Liverpool City Region identifies regional assets more widely than port, harbour and operation and maintenance, including industrial parks linked through road, rail and water infrastructure. Based on this supply chain infrastructure, the Liverpool City Region aims to be a national offshore renewable hub that services offshore developments beyond the Liverpool Bay and Irish Sea area. Indeed, services are marketed on the basis of HGV drive times (Figure 3-1).

Offshore Renewable Energy Science and Innovation Audit

In Autumn 2015 the UK Government initiated a programme of Science and Innovation Audits (SIA's) as an approach to strengthen the UK Innovation evidence base¹⁰. It invited consortia to bring forward proposals which could provide focus on analysing regional strengths and identify mechanisms to realise their potential. The Offshore Renewable Energy SIA was conducted across the north of England and Scotland by a consortium comprising: the Universities of Durham, Hull, Liverpool and Newcastle; four Local Enterprise Partnerships (Humber, Liverpool City Region, North-East, Tees Valley Combined Authority) and Scottish Enterprise; the Offshore Renewable Energy Catapult (ORE Catapult).

The Offshore Renewable Energy SIA consortium was formed so that it covers a geographically distinct unit, embracing the coastal regions of Northern England and Eastern Scotland with their well-developed maritime industries and associated supply chains. The geographical areas included in this SIA are linked through common interest as well as long histories of co-operation and joint enterprise in the offshore energy sector which developed out of their historical maritime activities in the major ports of Northern England and Eastern Scotland.

Local Strategic Economic Plans identify existing connections between the areas including research linkages, key businesses with multiple locations, the existence of established business networks and the primary locations of the Offshore Renewable Energy Catapult.

Of interest to defining local areas, the report notes that Strategic Economic Plans enable LEP's to frame opportunities and growth plans for offshore renewable energy

¹⁰ Source: Offshore Renewable Energy Science and Innovation Audit, BEIS: <https://www.ncl.ac.uk/media/wwwnclacuk/business/files/sia-report-offshore-energy.pdf>

in the wider context of local economic plans. A number of key sites within the Enterprise Zone portfolio have been designated for offshore and sub-sea energy cluster development. In the North East, these include 7 sites around the North Bank of the Tyne and the Port of Blyth in the Round 1 Enterprise Zone and sites within the Round 2 Zone.

The report looks at the SIA area as a whole, as well as at a local level. Overall, when discussing local areas, the report reflects on LEP/Scottish Enterprise areas. Discussing infrastructure and investments, the report notes that Strategic Economic Plans enable LEP's to frame opportunities and growth plans for offshore renewable energy in the wider context of local economic plans.

Some of the energy strategies cover multiple LEP areas. For example, the South East LEP Energy Strategy and Action Plan includes a "Tri-LEP Strategic Energy Delivery Group", so in this case the area is defined by three LEP areas.

3.2.3 Summary of Current Practice

Local and regional geographies are defined in relation to offshore developments to suit a variety of purposes. Currently, there are no examples of systematically defined local areas for socio-economic impact assessment anywhere in the world and therefore the principles and approach that will be defined in this study will be the first of its kind.

The onshore geographies that are defined in relation to offshore activity can be split into two categories;

- Small, localised geographies that are used to distribute a defined benefit, such as community benefit funding, taxation receipts or community ownership;
- Larger, regional geographies that are based on supply chain opportunities that could be realised as a result of the offshore development.

The two categories of local area are used to consider different socio-economic impacts. For example, the focus of the smaller geographies and defined benefits are the social impacts associated with culture, heritage, access to services and environment, whereas the focus of the larger geographies are the economic impacts

associated with employment and opportunity. The role and focus of the two geographies will be taken into consideration throughout this study.

4. Case Studies

The spatial analysis of current approaches and the testing of new principles is applied to case studies from offshore developments across Scotland. These case studies were identified through a set of principles to ensure a representative sample was selected. More details on the case studies and the process of identifying them are given in this section.

4.1 Identifying the Case Studies

4.1.1 Principles for Identifying Case Studies

The principles for identifying the case studies used in this project were:

- To be operational or near completion of the construction phase;
- To include representation from different renewable energy technologies (e.g. floating offshore wind, fixed offshore wind, tidal);
- To include representation from other relevant sectors (e.g. aquaculture);
- To have an identified local area;
- To have assessed some socio-economic impacts in that area;
- To be located in Scottish waters; and
- Good data availability, in particular any with ex-post analysis.

As a result of these principles, a number of potential case studies were rejected, such as Hywind, for which the Environmental Impact Assessment does not contain a local area in which the socio-economic impacts were assessed.

4.1.2 Case Studies



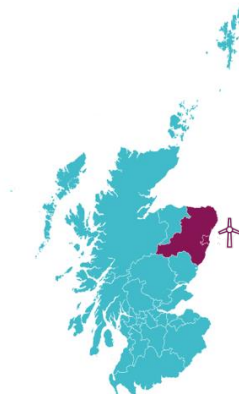
The case studies identified for further analysis are:




- Beatrice Offshore Wind Farm;
- Robin Rigg Wind Farm;
- Kincardine Floating Offshore Wind Farm;

- Moray Offshore Wind Farm;
- Eilean Grianain North Salmon Fish Farm;
- MeyGen 1A Tidal Energy.

A summary of each of the case studies are given in Table 4-1.

Table 4-1 Case Studies Properties

Map of Case Study	Properties
	<p>Name: Beatrice Offshore Wind Farm</p> <p>Type: Offshore Wind, Fixed</p> <p>Local Area Used in Assessment: The combined Local Authorities of Highland, Moray, Aberdeenshire and Aberdeen City</p> <p>Date of Assessment: 2012</p>
	<p>Name: Robin Rigg Wind Farm</p> <p>Type: Offshore Wind, Fixed</p> <p>Local Area Used in Assessment: The combined Local Authorities of Dumfries and Galloway and Cumbria County</p> <p>Date of Assessment: 2002 and 2011</p>
	<p>Name: Kincardine Offshore Wind Farm</p> <p>Type: Offshore Wind, Floating</p> <p>Local Area Used in Assessment: The combined Local Authorities of Aberdeenshire and Aberdeen City</p> <p>Date of Assessment: 2016</p>

Map of Case Study	Properties
	<p>Name: MeyGen Phase 1</p> <p>Type: Tidal Stream, Fixed</p> <p>Local Area Used in Assessment: Two local areas considered, the historic county of Caithness and the local authority of Highland</p> <p>Date of Assessment: 2012</p>
	<p>Name: Moray West Offshore Wind Farm</p> <p>Type: Offshore Wind, Fixed</p> <p>Local Area Used in Assessment: The combined Local Authorities of Highland, Moray, Aberdeenshire and Aberdeen City</p> <p>Date of Assessment: 2018</p>
	<p>Name: Eilean Grianain North Salmon Fish Farm</p> <p>Type: Aquaculture</p> <p>Local Area Used in Assessment: The village of Carradale in Argyll and Bute</p> <p>Date of Assessment: 2015</p>

Source: BiGGAR Economics Analysis

4.2 Analysis of Case Study Methodologies

The approach taken during the case study analysis was to split the impacts considered into two categories. This reflects the initial conclusions of the first interim report. The two categories of impacts are:

- supply chain and investment impacts; and
- wider socio-economic impacts.

The outputs of this analysis were used to guide the development of the principles.

4.2.1 Supply Chain and Investment Impact Assessment

As the principles for this study were being developed, three key stages for identifying the local areas for supply chain and investment impacts were identified, these are:

1. Identifying which economic impacts will be considered;
2. Identifying where the epicentres of these impacts will be; and
3. Identifying what defined economic/political organisations represent these areas.

There was variation in the impacts that were considered across the case studies. Table 4-2 shows the impacts which were considered in each of the socio-economic assessments of the case studies. The case studies have been anonymised and the cells highlighted to display the frequency in which impacts were considered.

Table 4-2 Supply Chain and Investment - Impacts Considered

Impacts Considered	CS1	CS2	CS3	CS4	CS5	CS6
Direct Jobs	Yes	Yes	Yes	Yes	Yes	Yes
Direct GVA	Yes			Yes	Yes	Yes
Multiplier Jobs	Yes			Yes	Yes	
Multiplier GVA	Yes			Yes	Yes	
Output						
Inward Investment				Yes		
Supply Chain Development and Sustainability	Yes			Yes	Yes	Yes
Fragile economies	Yes	Yes		Yes		
Fishing and Marine Economy		Yes		Yes		Yes
Cell colour if impact has been considered...						Yes

Source: BiGGAR Economics and Heriot Watt University Analysis

The case studies assessments included a range of supply chain and investment impacts and most selected a subset of these impacts to discuss. The direct jobs supported was the only impact that was considered in every study. The direct Gross Value Added was considered less often. The multiplier jobs and GVA were only considered in half of the studies. The impacts were rarely measured in output. The majority of studies considered how the development would impact on the existing sectors in the area or actions to support the development of the supply chain.

Table 4-3 Supply Chain and Investment - Epicentres of Impact Considered

Epicentres Considered	CS1	CS2	CS3	CS4	CS5	CS6
Offshore Site						
Landing Site of Main Cable						
Substations						
Primary Construction Port/Base						
Primary Operational Port/Base						

Source: BiGGAR Economics and Heriot Watt University Analysis

The epicentre approach is not explicitly used in any of the case study assessments and therefore it was necessary to review the language used in the assessment to identify any references to potential epicentres of impact. This found epicentres were only mentioned in half of the studies and the primary construction and operational ports were the epicentres most likely to be identified.

4.2.2 Wider Socio-economic Impact Assessment

The case study assessment was also analysed to compare the wider socio-economic impacts that were included and the reference to any of the epicentres from which the wider socio-economic impacts were generated.

Table 4-4 Wider Socio-economic - Impacts Considered

Impacts Considered	CS1	CS2	CS3	CS4	CS5	CS6
Tourism						
Recreation						
Cultural Assets						
Local Trust and Role in Decision Making Systems						
Traffic						
Fragile economies						
Fishing and marine economy						

Source: BiGGAR Economics and Heriot Watt University Analysis

The inclusion of wider socio-economic impacts was highly selective in the case study assessments. The impacts on tourism and recreation were considered in the majority of studies, however the other impacts were only considered in one study

each. This divergence in approach makes the overall wider socio-economic impacts difficult to compare between the studies.

Table 4-5 Wider Socio-economic - Epicentres of Impact Considered

Epicentres Considered	CS1	CS2	CS3	CS4	CS5	CS6
Visibility of Offshore Site	Yes					Yes
Visibility of Onshore Infrastructure				Yes		
Offshore Site	Yes			Yes		
Onshore Infrastructure						
Primary Construction Port/Base		Yes				
Primary Operational Port/Base		Yes				

Source: BiGGAR Economics and Heriot Watt University Analysis

Epicentres of impact were more likely to be discussed and mentioned in the assessment of wider socio-economic impacts than they were in the assessment of supply chain and investment impacts. The visibility of the offshore or onshore infrastructure was explicitly considered in half of the assessments. One study considered the role that the primary operational and construction port had as a driver of the wider socio-economic impacts.

4.3 Conclusions from Case Study Analysis

The analysis of the case studies has highlighted the similarities and differences in the approaches that have been taken previously. In particular:

- There is a significant variation in the impacts which have been considered in the assessments. In particular, beyond the measures of jobs and GVA there are no social impacts which are consistently measured as part of these studies;
- The supply chain and investment impacts in the studies, which generate the reported jobs and GVA figures, also varied in approaches and scope of the analysis. Not all studies included an analysis of the local supply chain capabilities or considered economic multipliers;

- Certain impacts, which have been identified in studies such as the Sciencewise report, have not been scoped into any of the case studies; and
- The epicentres of impact that are implicitly considered in these studies are the offshore infrastructure and visibility or a radius around it.

The variation in impacts that were considered in each of the case studies was reflected in the local areas that were selected for the analysis. Those studies that included the largest number of wider socio-economic impacts were more likely to consider these impacts using a smaller local area.

5. Stakeholder Consultations

This study included consultations with stakeholders, both developers and public sector agencies, to gain an understanding of how local areas were considered from different viewpoints. This describes the consultation process and a thematic analysis of the consultation outcomes.

5.1 Consultees

The initial consultees were proposed and agreed during the Project Inception Meeting on 24th January 2019. In this meeting it was agreed that the consultation programme should cover public sector agencies and the industry representatives selected from the case studies. The agreed organisations to consult with were:

- Public Sector Agencies
 - Crown Estate Scotland;
 - Highlands and Islands Enterprise;
 - Marine Scotland Aquaculture Division;
 - Scottish Coastal Forum;
 - Scottish Enterprise.
 - Scottish Government Energy Division;
 - Scottish Natural Heritage;
 - Scottish Renewables;
 - Skills Development Scotland.
- Offshore Project Developers
 - E. ON - Robin Rigg Offshore Wind Farm;
 - EDPR - Moray Offshore Wind Farm;
 - Mowi Scotland (formerly Marine Harvest) - Eilean Grianain North Salmon Fish Farm;

- Pilot Offshore - Kincardine Offshore Wind Farm;
- Simec Atlantis - MeyGen Phase 1A;
- SSE - Beatrice Offshore Wind Farm; and
- The European Marine Energy Centre.

BiGGAR Economics worked with the Steering Group to identify the most appropriate individuals within these organisations to contact regarding this study. Initial contact was made with each individual via email and then followed up with by a telephone call in order to arrange a time to discuss the project.

Of the agreed consultees, four were removed from the list:

- Mowi Scotland (formerly Marine Harvest) has been removed from the list as the aquaculture case study has not yet been agreed;
- Marine Scotland Aquaculture Division were removed as staff were not available to meet during the consultation period;
- Scottish Renewables has been removed from the list after initial conversations concluded that developers would be in a better position to give an industry perspective; and
- the European Marine Energy Centre has been removed from the list after initial conversation concluded Highlands and Islands Enterprise would be in a better position to comment on the EMEC Economic Impact Assessment, as it was the commissioning body.

5.2 Thematic Analysis of Consultations

The qualitative research was subject to a “framework approach” to thematic analysis. The thematic framework underpinning the qualitative analysis is matrix-based and involved labelling, classifying and organising data in relation to main themes, concepts and categories. These themes are described throughout the report.

The themes discussed with the developers were different to those discussed with the public sector bodies.

Developer themes:

- Local area selection;
- Role of Epicentres;
- Engagement with Stakeholders;
- Community Benefit Funding;
- Use/purpose of studies; and
- Timing of studies.

Public Sector Body themes:

- Perception of local areas;
- Impacts of concern;
- Role of epicentres; and
- Use of socio-economic assessments.

5.2.1 Developer Themes

Local area selection

Developers did not have a shared method to define local areas in the context of environmental impact assessments (EIAs). The variety of impacts that are considered within a socio-economic chapter of an EIA presents a challenge to assessors who are required to assess the relative magnitude of an impact based on the geographically designed receptor. The selection of a local area for supply chain economic impacts will likely not be appropriate for recreational impacts. Indeed, for one of the developers consulted, one of the main challenges in defining the local areas of interest is often it is hard to tell a coherent story about the areas of impact due to their different nature.

In the case of offshore wind farms, the developers reported the epicentres considered when defining the local area for the EIA are:

- the location of the port facilities;
- the onshore location of the cables; and
- the location of the substation.

The final decision on the port facilities to be used are unlikely to have been made at the time of undertaking the EIA. A range of factors are considered when deciding the

port location, including the physical space and availability of space, access to crew vessels, accessibility at all stages of the project and water depth.

The visibility of the structures is another important determinant in defining the local areas of impact, alongside considerations surrounding the supply chain and synergies with other industries operating in the development's proximity.

Role of Epicentres

The developer consultees had not explicitly considered the role of epicentres in driving impact. However, upon reflection many concluded that the approach they had taken to defining local areas had implicitly considered epicentres of impact.

The epicentres were considered differently by all developer consultees. A different treatment was reserved according to the nature of the impact. The main epicentres of impact that were identified by the developers consulted included the visual impact from the offshore development and the impact of the onshore infrastructure such as ports, cable landings and substations. Alongside the consideration of epicentres for the construction period, account was taken of those areas impacted throughout the operations and maintenance period of the development.

The consultees identified the need to treat different impacts, and their epicentres separately, due to the nature of the impacts. For example, one developer included all the local authorities which were within a given radius from the development in assessing the visual impact of an offshore project. These areas were deemed relevant in the analysis of tourism and recreational impacts. Within the same project, the economic impact was considered over slightly different local areas due to considerations surrounding infrastructure availability and supply chain base.

Developers considered areas of change to be more important in defining “local” than areas of activity

Developers primarily focused on areas of change when considering epicentres, rather than areas of impact. For example, one of the offshore wind developers had a clear opinion of what was local to their development based on the visual impact of the primary ports and the visual impact of the turbines themselves. They did not

consider the main fabrication yard to be local because their activities there did not change the nature of that yard. As a result, the community benefit funding available to local communities did not include those communities beside the fabrication yard.

A potential issue in the definition of the epicentres of impact may be related to the fact that certain decisions about the location of support infrastructure may not have been already made at the time when the EIA is compiled. In the case of one of the developers the choice of the port had not been made at that point. The use of broad local areas, however, allowed for the inclusion of all the likely port locations to be included in the analysis.

Engagement with Stakeholders

All the developers consulted had engaged with political or economic stakeholders. Engagement occurred at a local, regional and national level and involved a range of actors, depending on the developer's needs and the stage of the process.

Highlands and Islands Enterprise (HIE) and Scottish Enterprise (SE) were among the national and regional economic organisations with which all developers sought to engage. By collaborating with these organisations, developers sought to benefit from their regional and national supply-chain expertise. In addition to engagement with national organisations to gain an understanding of the supply-chain one of the developers also engaged with Crown Estate when considering potential sites for a development.

Developers engaged with political and community stakeholders at all levels, from the European Union to Community Councils

There is an increased policy focus on maximising the local and UK content from a given offshore development¹¹. As a result, developers considered it was important to engage with local businesses to support their entry into the supply chain. According to one of the developers, this required engaging with potential Tier 3 and Tier 4 suppliers and ensuring the main contractors understood the local opportunities available to them. Local organisations such as Chambers of Commerce

¹¹ HM Government (2019) Industrial Strategy - Offshore Wind Sector Deal

complemented the role of regional and national organisations in providing developers with knowledge of the local supply chain. This resulted, as in the case of one of the developers, in the compilation of a list of potential suppliers.

As with the engagement with economic actors, the engagement with political organisations takes place at different levels, ranging from EU level, where EU funding was available, through Scottish Government level to local Community Councils (CCs). A connection between the latter two levels is provided by Members of Parliament with whom some of the developers had actively engaged.

The aim is to engage with the people living and being likely affected by the development. In the case of one of the developers this resulted in the organisation of drop-in sessions in public halls. While open to everyone from the community to voice their potential concerns, often the focus of those attending was how to maximise the benefits arising from the project. Early offshore wind developers saw local engagement as an opportunity to highlight the benefits of introducing a new industry and technology to a country. Other developers engaged with local communities either by writing to all community councils affected by the development, or by engaging with the relevant council's economic development teams. Another form of engagement consisted of engagement with education providers and the promotion of STEM activities.

A developer highlighted how there seems to exist a disconnect between the mechanism regulating Contract for Difference auctions, which are based on production at the lowest cost, and the focus on local and UK content. It was argued that, under the current regulatory framework, the two go hand in hand only when a subcontractor is internationally competitive. A developer suggested that when engaging at local level, most of the interest was on the opportunities arising for local businesses.

Community Benefit Funding

The definition of the areas in receipt of community funding and their management varied across projects in their specifics, though a few common themes emerged. Community benefits are generally made available to those communities that are either visually affected by the development or host some of the development's

infrastructure, such as for instance a substation or a cable landing. This approach implicitly considers multiple epicentres of impact. Typically, the developers, having identified the areas of impact, determined access to community benefit funding on the basis of community council boundaries. These areas were chosen to take advantage of the governance and accountability structures within community councils and so potential applicants understood the areas and implications for their eligibility.

Use/purpose of studies

Developers made different use of the socio-economic impact assessments they commissioned. For instance, since the publication of the EIA of one of its projects one of the developers consulted has kept a record of their involvement with the supply chain. The aim was to inform future applications in the light of increased economic and political interest with local content. Another developer used EIAs in ex-post analyses, which consider how much of the supply chain economic impact was achieved.

Many of the developers considered the outputs of the socio-economic assessments to be a positive story and the results of the analysis were used in communications with stakeholders and the community. When local impacts were reported, these were accompanied with maps or definitions to ensure that the geographies were understandable to all stakeholders.

The studies are used to address some of the issues concerning the local community. These include the effect of the development on local employment, its impact on navigation, tourism, recreation and fishing.

Timing of Studies

The socio-economic impact assessments that contribute to EIAs are written years before the beginning of the construction of most offshore projects. This time mismatch may result in some issues concerning the assessment. As highlighted before, at the time of the EIA submission not all the sites will have been selected.

The analysis contained in the EIA may also be affected by technological changes. This is all the more the case in an industry such as offshore wind that has undergone rapid technological change since its emergence. The use of different technologies when the project is actually built may lead to different impacts from the ones expected at the completion of the EIA.

The time lapse between the socio-economic assessments and the project construction was highlighted as an important issue

A similar issue arises with the supply chain, which may undergo changes, become more developed or clustered at the time of delivery. As a result, the companies that may be able to take advantage of supply chain opportunities and the scale of the opportunity may vary significantly between the socio-economic impact assessment and any contracts being secured.

The approach that had been taken by some consultees to address this issue was to select as wide a local area geography as possible in order to reflect the ambiguity.

5.2.2 Public Sector Body Themes

Perception of local areas

The public bodies' geographic remit influenced what each organisation considers to be its local area of interest in the context of a given offshore development. The organisations consulted operate at a national level and, as such, they consider Scotland as the primary area of interest in their analyses.

Concern with lower levels of geographical aggregation varies across organisations, depending on the relevance of the data available at that level and the stated aims of the organisation. For example, one of the public bodies consulted, while considering regional and local level impacts, did not include geographies beyond the level of City Deal Regions and Regional Partnerships in its analysis. Another organisation reported using local authority level data if it was reliable. Alternatively, it would construct wider geographies consisting of multiple local authorities if the data was not reliable.

The interest in local areas is strongest within the organisations consulted which have local teams or act effectively as umbrella bodies for more regional organisations. In the latter case, what each regional organisation considers to be local varies and ranges from very localised impacts around the epicentres, such as those arising from a noise associated with a port, to wider areas of impact, such as those linked to supply chain opportunities from an offshore wind farm.

Impacts of Interest

The impacts of interest vary across the public sector bodies consulted and depend upon what the organisation's objectives are. The public bodies consulted had an interest in issues including economic development and its distributional impact, skills development, environmental and natural heritage.

The different categories of impact (environmental, social, recreational), as considered in the socio-economic and tourism assessment, are then evaluated against a given organisation's remit. For instance, if a public body was concerned with economic development, it would consider tourism issues from an economic perspective, rather than focussing on the social role played by the tourism industry in the local economy. Similar considerations would be applied to other areas of impact.

While most organisations consulted had a similar approach to the socio-economic and tourism chapter, this was not the case for those organisations that, as part of their remit, have to balance different objectives. This was the case for one of the public bodies consulted which considered environmental, social and economic impacts and used the socio-economic chapter in this context.

A consultee highlighted how it may be complex to define the location of socio-economic impacts, as opposed to other types of impact. For instance, there would be a good understanding of where exactly the impact on fisheries, mammals or birds would take place. This is more difficult when supply chains are considered, given their international nature.

From an economic perspective, the development of a supply chain was seen as an important aspect with a consultee suggesting that it would be important for Scotland to focus on specialisation in some aspects of the supply chain, rather than

disseminate resources in an attempt to be competitive across the whole of the supply chain.

Public sector organisations also collaborate together in bodies such as the Offshore Renewable Programme Board (ORPB) or work with UK-wide renewable sector organisations.

Roles of Epicentres

The public bodies consulted focused on a series of epicentres depending on their remit. When an organisation focuses on economic impact, the epicentres considered tend to be located onshore and include the supporting port, the manufacturing facilities, the location of supply chain companies and the number of local construction jobs created.

Another onshore epicentre considered by one of the public bodies consulted is the location of the subsea cable. None of the public bodies consulted seeks to directly influence where the developer would place the cables onshore nor where on the seabed they would be placed. However, both natural obstacles and existing seabed infrastructure constrain where the cabling infrastructure can be placed and have to be considered by developers.

Some of the public bodies consulted have an interest in tourism and recreational impacts. The epicentres of this onshore impacts include the effects on coastal footpaths and locations of informal recreation along the coast line. One of the public bodies consulted highlighted how it would be beneficial to collect more data on the mental health benefits of outdoor activity, especially on less advantaged communities, coastal communities and visitors, which could complement the existing onshore analysis on these epicentres of impact.

Some of the other public bodies consulted have an interest in offshore impacts such as visual impacts and impacts on the wildlife. Thus, these organisations focus on offshore epicentres. The areas designated for this type of analysis depend on the type of impact, may be very localised and can be informed by existing evidence as is the case for instance for birds' foraging ranges. Otherwise, epicentres of impact are

delimited according to where the site is and boundaries of impact drawn on the basis of, for instance, the boundary line that is closest to shore.

Within a public body there may be at times interest across both onshore and offshore epicentres, though they may be considered by different branches of the same organisation. That was the case for one of the public bodies consulted, which had an interest in offshore epicentres, whereas its sister organisation was concerned with impacts occurring onshore.

Use of Socio-Economic Assessments

Consultees did not use the socio-economic assessments in a similar way. Usage varied ranging from null, through moderate to extensive and mainly depended on whether the public body consulted had an interest in socio-economic issues.

It was found that where socio-economic impacts are not of direct interest to the organisation consulted, they are not considered. Instead other sources of information, publicly available data or other EIA chapters, such as terrestrial ecology or historic environment were used by the organisations to achieve their objectives.

A moderate level of socio-economic assessments usage was attributable to one of the consultees which considered this chapter only as far as it helped in considering the multi-dimensional relationship between social, economic and environmental considerations.

Among those making a considerable use of the socio-economic assessment, one of the consultees focussed, for instance, on the number of jobs that a development would generate at a Scottish level. This guided post construction assessments, in the case of one of the consultees, with the aim of keeping developers to their commitments. In one case it was highlighted how the economic assessment may lead to a redistribution of the resources within the organisation itself if a strong case emerges for a given sector.

5.3 Summary of Consultations

The consultation exercise highlighted a number of key issues to be considered during the design of the principles for defining local areas. All stakeholders were

interested in improving the current process to give structure to the approach, either to strengthen the case made to planning authorities and communities or to improve services and hold industry accountable.

The main issues that developers considered to be important for the defining of local areas were those concerning which socio-economic impacts were under consideration, how those impacts were perceived by stakeholders and the timing of the socio-economic assessments in relation to other aspects of the project.

The main issues that the public sector bodies considered to be important for the defining of local areas were how the defined areas related to their geographic mandate, the types of socio-economic impacts considered and how the outputs of the assessment were going to be used.

6. Principles

The analysis of the current approaches taken to defining local areas for socio-economic assessment of offshore developments and the stakeholder consultations have highlighted the need for a defined set of principles to be used to guide the geographies used in these assessments. This section discusses these principles.

6.1 Development of Principles

The principles have been developed based on the key themes that have emerged from the literature review, current practice and the stakeholder consultations.

The supply chain and investment impacts were viewed separately from the wider socio-economic impacts across the literature, current policy and industry consultations. This is evident in the differences between areas of defined benefit and supply chain engagement programmes. The industry stakeholders also highlighted that considering all socio-economic impacts at the same geographic level could be inappropriate in the formal Environmental Impact Assessment process. Therefore, the definition of local area should be different for supply chain and investment impacts and wider socio-economic impacts.

The case studies and the industry consultations also highlighted the range of potential impacts for consideration and the implications for the selection of local areas. Impacts that are included in any assessment need to be appropriate for the level of assessment that is being undertaken and the scale of the project that is being assessed.

The stakeholder consultations and literature review identified multiple geographic locations that impacts can radiate from, which have been referred to as epicentres of impact in this report. These epicentres can be specific to individual impacts and can include the visibility of the offshore and onshore infrastructure, the main ports of

activity associated with the offshore development. These epicentres drive community perceptions of a development being local and therefore all epicentres of impact should be included within any defined Local Area.

The stakeholder consultations also highlighted the need for there to be meaningful engagement with communities in any Local Area. Industry engagement has been most effective in areas where it has been possible to work with pre-existing economic and political organisations to facilitate conversations and promote accountability. Similarly, when any impacts in a defined local area are discussed it is beneficial if the area described is understandable to all stakeholders. This allows impacts to be communicated in a clear and concise manner.

All case studies used collections of neighbouring Local Authorities to define local areas for supply chain and investment impacts. This resulted in the local areas used in the assessments being a single entity, which was easier to understand and allowed for the inclusion of economic multiplier impacts. The other principles defined in this chapter may result in geographies being selected that are discontinuous, particularly if potential epicentres are far apart. This would make the defined local areas less comprehensible and would hinder the inclusion of economic multiplier impacts.

Therefore, the principles that are outlined in this section have been developed within the framework of Dual Geographies, Local Areas and Epicentres.

- **Dual Geographies** - This means that the definition of local area is different for supply chain/investment impacts and wider socio-economic impacts. The split between these two is maintained throughout;
- **Local Areas** – This means that the geographies are clearly defined. Together these give the framework a clear structure and a clear definition of a unit of analysis; and
- **Epicentres** – This is a way of organising information about impacts and areas that is very flexible.

The combination of these three means that the framework has a clear structure but is still flexible enough to accommodate specific project needs .

6.2 Outline of Principles

The consultations and the spatial analysis have led to the identification of the following principles. These principles were first circulated in a draft version to members of the Steering Group for comment on 2nd May 2019 and have been updated to reflect comments received. The principles were further updated after the conclusion of the consultation programme. A summary of these principles is provided below and more details and justifications are provided in 6.3. The principles are:

- **Principle 1 (Dual Geographies)** - The local area for the Supply Chain and Investment Impacts should be separate from the local area(s) for Wider Socio-Economic Impacts;
- **Principle 2 (Appropriate Impacts)** - The appropriate impacts for assessments should be identified prior to defining the local areas;
- **Principle 3 (Epicentres)** - The local areas should include all the epicentres of the appropriate impacts;
- **Principle 4 (Accountability)** - The local areas used in the assessment should comprise of pre-existing economic or political geographies (community councils, local authorities, development agencies) to enhance accountability;
- **Principle 5 (Understandable)** - The local areas should be defined in such a way that they are understandable to the communities they describe; and
- **Principle 6 (Connected Geography)** - The local area for the Supply Chain and Investment Impacts should consist of connected (including coastal) pre-existing economic or political geographies.

6.3 Details of Principles

Below each of the six principles identified is outlined in detail.

6.3.1 Principle 1 – Dual Geographies

The process for defining local areas of socio-economic assessment will vary depending on the impacts that are considered¹². In particular, the Supply Chain and

¹² Dentinho, T., Ramos, P., & Hewings, G. (2016). Integration of a Regional Input-output Model With a Spatial Interaction Model For Localities. An Application to the Azores. *Revista Portuguesa de Estudos Regionais*, (42), 51-70

Investment Impacts should be considered separately from the Wider Socio-Economic Impacts and using different local areas.

The Supply Chain and Investment Impacts will cover those associated with the developer spending money and include impacts that can be quantified in economic terms such as employment supported or Gross Value Added. Examples of these are listed in the description of Principle 2.

The Wider Socio-economic Impacts will include other social or economic impacts that have been scoped into a particular assessment. These are more likely to be qualitative in nature, closer to the epicentres of impact and can be related to perceptions as well as observable actions. Examples of these are listed in the description of Principle 2.

This will allow the separation of the analysis and ensure that the scale of impacted areas is appropriate for magnitude and effect assessments undertaken in Environmental Impact Assessments.

6.3.2 Principle 2 – Appropriate Impacts

The local areas used for assessment shall be dependent on the particular Supply Chain and Investment Impacts or Wider Socio-Economic Impacts that are considered appropriate as part of the assessment. The range of potential impacts will vary between projects and the impacts identified as part of the Sciencewise study¹³ and others¹⁴ which are outlined in Section 3 would represent a guide, rather than an exhaustive list.

The impacts should be identified prior to the selection of the local area used in the assessment. This will ensure that the local areas selected are decided by the appropriate impacts, rather than vice versa.

- For example, the Supply Chain and Investment Impacts could include:

¹³ Marine Scotland and Sciencewise: A two way conversation with the people of Scotland on the social impact of offshore renewables, Collingwood Environmental Planning Limited in partnership with Pidgin Perfect, Nereus Environmental and University of Strathclyde

¹⁴ Rudolph, D. (2014) 'The Resurgent conflict between offshore wind farms and tourism: Underlying storylines', *The Scottish Geographical Journal*, 130(3): 168-187

- Direct Jobs & Gross Value Added (GVA);
 - Multiplier Jobs and GVA;
 - Inward Investment;
 - Supply Chain Development and Sustainability; and
 - Fragile Economies.
- The Wider Socio-economic impacts could include:
 - Tourism Assets;
 - Recreation Assets;
 - Cultural Assets;
 - Community Assets;
 - Local Trust and Role in Decision Making Systems;
 - Traffic;
 - Demographic Changes/Vulnerabilities
 - Fragile Economies; and
 - Fishing and Marine Economy.

The scope of this study is to consider the impacts that an offshore development will have onshore and to define geographies for considering these impacts in such a way that the is consistent, comparable and practical. In particular, the study considers the approaches taken to socio-economic impact assessments for projects, which are normally considered as part of the Environmental Impact Assessment or as an addendum to a planning application. As a result, some of the impacts listed above, in particular the Wider Socio-economic impacts, may not be considered by assessors.

The selection of appropriate impacts is the most subjective principle and as a result, the same offshore development may have different local areas assessed depending on which impacts are selected by an assessor.

6.3.3 Principle 3 – Epicentres

The particular aspects which are considered in the assessment will have different epicentres of impact, places from where the impacts radiate. For example, the main operational port for an offshore wind farm will be an epicentre as the port would experience a visible change in levels of activity and this would be noticeable to the

community and a direct result of the offshore wind development. Similarly, the area in which a fish farm is visible would be an epicentre of impact because the vista would experience a visible change, which could be noticeable to the community and a direct result of the fish farm development.

The geographic points which are the epicentres of impact should all be considered as part of the local areas for assessment in both the Supply Chain and Investment Impacts and the Wider Socio-Economic Impacts. For example,

- the Supply Chain and Investment Impacts could be geographically linked to:
 - the offshore site;
 - the landing site of the main cable (if applicable);
 - the substations;
 - the construction base and ports; and
 - the operational base and ports.

- the Wider Socio-Economic Impacts could be geographically linked to:
 - the visibility of the offshore site;
 - the visibility of the onshore infrastructure;
 - the offshore site itself;
 - the onshore infrastructure itself;
 - the construction base and ports;
 - the operational base and ports; or
 - worker accommodation facilities.

The socio-economic impact assessments that contribute to the planning process are typically undertaken in advance of decisions being made regarding the actual locations of key project sites, such as ports or substations. Therefore, the assessor should consider likely options (either from a developer generated shortlist or desk-based assessment) and all potential epicentres should be included in the defined local area.

This principle to delineation of impacts is also applied to assessments of other local markets I areas such as labour and housing¹⁵¹⁶.

6.3.4 Principle 4 – Accountability

The local areas should be defined in terms of active political and economic authorities such as community councils, electoral wards, local authorities or skills and enterprise agencies. Socio-economic data is reported in these defined geographies and therefore this approach will enable a reliable baseline to be described. Using existing economic or political geographies will also ensure that the community is able to be engaged and be democratically represented in discussions with the developer and the developer will be able to be held accountable for local impacts by these bodies¹⁷.

6.3.5 Principle 5 – Understandable

The communities should be able to understand the geographies described in the local impact assessments because this will encourage engagement¹⁸.

6.3.6 Principle 6 – Connected Geography

Assessing the Supply Chain and Investment Impact in a single connected geography (for example of multiple local authorities that share a border, or local authorities that surround an area of water) will facilitate the inclusion of multiplier economic impacts¹⁹. This approach is also applied to other geographically focussed impact studies in market such as housing²⁰²¹. There is no requirement for the Wider Socio-

¹⁵ Bhattacharjee A, Castro E, Maiti T, Marques J. 2016. Endogenous spatial regression and delineation of submarkets: A new framework with application to housing markets. *Journal of Applied Econometrics*, 31(1), 32-57

¹⁶ Pryce, G. 2013. Housing submarkets and the lattice of substitution. *Urban Studies* 50: 2682–2699

¹⁷ Aitken, M., Haggett, C. and Rudolph, D. (2016). Practices and rationale of community engagement with wind farms: awareness raising, consultation, empowerment. *Planning Theory and Practice*, 17(4), 557-576

¹⁸ Rudolph, D., Haggett, C., and Aitken, M. (2017) 'Community benefits from offshore renewables: The relationship between different understandings of impact, community, and benefit', *Environment and Planning C: Politics and Space*, 36(1): 92-117

¹⁹ Bhattacharjee A, Maiti T, Petrie D. 2014. General equilibrium effects of spatial structure: Health outcomes and health behaviours in Scotland. *Regional Science and Urban Economics*, 49, 286-297

²⁰ Pryce, G. 2013. Housing submarkets and the lattice of substitution. *Urban Studies* 50: 2682–2699

²¹ Bhattacharjee A, Castro E, Maiti T, Marques J. 2016. Endogenous spatial regression and delineation of submarkets: A new framework with application to housing markets. *Journal of Applied Econometrics*, 31(1), 32-57

Economic Impact local areas to be joined up and these can be assessed more locally in multiple local areas around the epicentres of impact

