

## Chapter S9.0. Social and Economic Data Collection for Marine Renewable Energy

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### S9.1. EXAMPLES OF SOCIAL AND ECONOMIC EFFECTS AND DATA TYPES

Social and economic effects can include benefits to or adverse effects on employment, local infrastructure and services, businesses, and communities. Examples and details are provided in Table S9.1 for social data and in Table S9.2 for economic data. For each table, possible data types are sorted by baseline data and development/operational data. Baseline data are those that should be collected prior to project development to better understand the current social and economic situation within the project areas, communities, and greater region. Development/operational data are those that should be collected once work begins and will help to understand changes that occur within the project areas, communities, and greater region that may be due to the MRE development. It is important to collect both baseline and development/operational data so that effects can be compared, changes can be understood, and ultimately lessons can be learned from each project.

**Table S9.1.** Social data and information examples for baseline data collection and development/operational data collection, developed in collaboration with Ocean Energy Systems (OES)-Environmental and Offshore Renewables Joint Industry Programme Ocean Energy (ORJIP Ocean Energy) expert workshops (Copping et al. 2017; and Copping et al. 2018).

Categories	Possible types of baseline data	Possible types of development/operational data
Social/cultural context and communities	<ul style="list-style-type: none"> <li>• Social dynamics, social structure/characterization, community structure</li> <li>• Local demographics (e.g., census data, inclusion of indigenous communities)</li> <li>• Cultures and values, cultural norms</li> <li>• Traditional activities (e.g., fishing, harvesting, local aquaculture, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Impacts to rural, coastal, and indigenous communities</li> <li>• Impact of offshore and onshore project footprint and activities</li> <li>• Changes in power demand and supply</li> <li>• Displacement of traditional activities, cultural heritage, recreational activities</li> </ul>

	<ul style="list-style-type: none"> <li>• Geographic extent</li> <li>• Well-being indicators (see below)</li> <li>• Designated areas (e.g., protected, conservation, cultural/heritage areas)</li> <li>• Valuation of area</li> </ul>	<ul style="list-style-type: none"> <li>• Changes to valuation of area</li> <li>• Visual impacts</li> <li>• Cost of living</li> </ul>
Leisure, recreation, and tourism	<ul style="list-style-type: none"> <li>• Core path designations</li> <li>• Marine recreation/tourism areas</li> <li>• Sailing routes</li> <li>• Recreational fisheries</li> <li>• Beaches, viewpoints, land-based recreation areas</li> </ul>	<ul style="list-style-type: none"> <li>• Exclusion of activities</li> <li>• Number of tourists</li> <li>• Changes to recreation opportunities</li> </ul>
Local services, infrastructure, and facilities	<ul style="list-style-type: none"> <li>• Education</li> <li>• Healthcare</li> <li>• Social care</li> <li>• Ports</li> <li>• Roads</li> <li>• Utility grid</li> </ul>	<ul style="list-style-type: none"> <li>• Pressure on services and local infrastructure</li> <li>• Workforce (during the entire project) and their requirements such as housing/accommodations</li> <li>• Requirements to support community</li> </ul>
Health and well-being	<ul style="list-style-type: none"> <li>• Well-being indicators such as income and wealth, work or job quality, environment quality and resilience, safety and security, cultural well-being, sense of place, community and social connections</li> <li>• Health benefits</li> <li>• Health of the community (mental, physical, cognitive)</li> </ul>	<ul style="list-style-type: none"> <li>• Changes to well-being indicators</li> <li>• Impacts to health benefits</li> <li>• Changes to community health</li> </ul>
Success stories and lessons learned	<ul style="list-style-type: none"> <li>• Positive case studies from MRE industry or analogous industries in the same area</li> <li>• Lessons learned from other MRE or analogous industry developments</li> <li>• Social assessment and information</li> <li>• Community opinions (such as social acceptance) from MRE or similar projects in the same area</li> </ul>	<ul style="list-style-type: none"> <li>• Social acceptance and awareness – changes/impacts from project</li> <li>• Community engagement and stakeholder inclusion</li> <li>• Changes in knowledge of MRE</li> </ul>

Energy security and clean energy	<ul style="list-style-type: none"> <li>• Community energy sources</li> <li>• Value of clean/renewable energy</li> <li>• Challenges with current energy sources</li> </ul>	<ul style="list-style-type: none"> <li>• Installed capacity and availability of power to the local community</li> <li>• Overview of potential for reduction, carbon offsets, etc.</li> <li>• Greenhouse gas and pollutants avoided</li> </ul>
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**Table S9.2.** Economic data and information examples for baseline data collection and development/operational data collection, developed in collaboration with Ocean Energy Systems (OES)-Environmental and Offshore Renewables Joint Industry Programme Ocean Energy (ORJIP Ocean Energy) expert workshops (Copping et al. 2017; and Copping et al. 2018).

Categories	Possible types of baseline data	Possible types of development/operational data
Businesses/sectors and existing industries	<ul style="list-style-type: none"> <li>• Ports and harbors</li> <li>• Commercial fishing (supply chain value – onshore processing, fishing grounds for targeted species, aquaculture areas)</li> <li>• Coastal recreation and tourism (number of visitors, value to the local economy, key activities, seasonal trends)</li> <li>• Shipping and navigation (routes used, economic value to region, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Local/regional businesses</li> <li>• Inward investment potential at each stage of development</li> <li>• Exclusion of marine uses or users (such as displacement of commercial fisheries)</li> <li>• Footprint of development</li> <li>• Vessel management plan</li> </ul>
Employment and wages	<ul style="list-style-type: none"> <li>• Employment statistics including level of employment/unemployment from census</li> <li>• Key industries and employers</li> <li>• Employment trends and projections</li> <li>• Gross wages from annual business statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Local job and skilled job creation</li> <li>• Job creation potential</li> <li>• Employment multiplier</li> <li>• Jobs staffed locally or by outside sources</li> <li>• Net job gain or loss</li> <li>• Changes to wages</li> <li>• Gross wages</li> </ul>
Marine Renewable Energy (MRE) industry/	<ul style="list-style-type: none"> <li>• Local and regional supply chain</li> <li>• Gross value added</li> </ul>	Impacts to <ul style="list-style-type: none"> <li>• Gross value added (product expenditure – capital and operational)</li> </ul>

contribution		<ul style="list-style-type: none"> <li>• Use of local economy vs. outside/external sources</li> <li>• Changes in local and regional supply chain (e.g., number of companies operating in areas such as port operations, engineering, deployments, applied research/innovation/testing, etc.)</li> </ul>
Exports	<ul style="list-style-type: none"> <li>• Key local products and services</li> <li>• Export value from national statistics databases</li> </ul>	<ul style="list-style-type: none"> <li>• Changes in export of products and services</li> <li>• Products created</li> <li>• New services</li> <li>• Value to local/regional economy</li> </ul>
Existing infrastructure	<ul style="list-style-type: none"> <li>• Renewable energy developments</li> <li>• Ports and harbors</li> <li>• Grid and communication (e.g., broadband) cables and transmission line capacity</li> <li>• Oil and gas pipelines and gas storage</li> <li>• Current development and upgrade plans</li> <li>• Current infrastructure limitations</li> </ul>	<ul style="list-style-type: none"> <li>• Added infrastructure or capacity</li> <li>• New infrastructure developments and/or projects</li> </ul>
Coastal development	<ul style="list-style-type: none"> <li>• Current coastal developments</li> <li>• Economic value to region</li> <li>• Proposed developments - renewable energy developments, ports and harbors (i.e., from National Infrastructure Plans)</li> <li>• Areas zoned for future development</li> </ul>	<ul style="list-style-type: none"> <li>• New developments with direct links to MRE project</li> <li>• Other industry developments (ports and harbors, shipping, navigation)</li> </ul>
Local/regional economy	<ul style="list-style-type: none"> <li>• Transport links (rail, bus, car transport from project location to major centers)</li> <li>• Supply chain and markets</li> <li>• Major sectors contributing to local/regional economy</li> </ul>	<ul style="list-style-type: none"> <li>• Economic impact to community (such as revenue generated, changes in valuation of the area, clustering effect)</li> <li>• Engagement with local suppliers and new businesses</li> <li>• Inclusion of impact to remote and indigenous communities (access to economic activity)</li> </ul>

## S9.2. REFERENCES

Copping, A., Hutchinson, I., Fox, J. 2017. Exploring the State of Understanding and Practice used to Assess Social and Economic Risks and Benefits of Marine Renewable Energy Development. Workshop conducted at the European Wave and Tidal Energy Conference, Cork, Ireland. <https://tethys.pnnl.gov/events/exploring-state-understanding-practice-used-assess-social-economic-risks-benefits-marine>

Copping, A., Hutchinson, I., Fox, J., Freeman, M. 2018. Case Studies on Social and Economic Effects around MRE Development. Workshop conducted at the Environmental Impacts of Marine Renewables Conference, Kirkwall, UK. <https://tethys.pnnl.gov/events/case-studies-social-economic-effects-around-mre-development>