Marine Management Organisation

Stakeholder engagement to assess the economic impact of the South marine plans

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Executive Summary

This report, which ran from February 2015 to May 2015, presents an assessment of the economic impact on industry of the three South Inshore and South Offshore marine plan options which were under consideration at the time of this report being undertaken. **All references to the South marine plans and South marine plan options should be taken as correct at the time of the work being undertaken, though the South marine plans may have subsequently changed and references may not be correct now. This is also the case for renewables, where it has been announced that the Navitus Bay development will no longer proceed[1].** The assessment has been collated from a combination of interviews with stakeholders in industry and other relevant bodies and Eunomia's own views and expertise within the area of marine planning and its impact on sectors.

The impacts considered cover both the economic impact, in terms of impact on number of businesses, direct employees and the Gross Value Added of the marine sectors, as well as the administrative impact, considered to be both the costs associated with review and implementation of the plans and savings on costs of applying for marine licences. The administrative impact is extremely insignificant in comparison to the economic impact, being responsible for less than 0.1% of the total impact across all plan options.

Overall, each of the three plan options is expected to result in a net economic benefit over the 20 year life of the plans. For the Balanced plan option, this is estimated to be £791 million, expressed as net present value (NPV). For the Flexible plan option, this is estimated to be £28 million (NPV) and for the Prescriptive plan option £1.05 billion (NPV). Most of the positive benefit will fall on the largest sectors in the South plan areas, namely coastal tourism, marine recreation, fisheries and ports, and will be due to the additional certainty provided to the sectors, particularly under the Prescriptive policy, which will enable to better predict the outcomes of planning decisions. Under the Balanced plan option, the benefits are vastly reduced due to the low-strength nature of the policies, as it is felt that the policies will be unlikely to have much impact on any planning decisions, at least to the extent of impacting sectors economically.

[1] http://www.navitusbay.com/

1 Introduction

Eunomia Research & Consulting Ltd (Eunomia) were commissioned by the Marine Management Organisation (MMO) to undertake an ex-ante assessment of the socio-economic impacts associated with the introduction of the South Inshore and Offshore marine plans on businesses. This assessment has been conducted via a programme of interviews with stakeholders in industry and seeks to quantify the key impacts associated with the introduction of the marine plans. The findings of this study are expected to feed in to an Impact Assessment associated with the preferred option of the South Inshore and Offshore marine plans. **Please note, all references to the South marine plans and South marine plan options should be taken as correct at the time of the work being undertaken, though the South marine plans have subsequently changed and references may not be correct now. This is also the case for renewables, where it has been announced that the Navitus Bay development will no longer proceed[2].**

1.1 Current situation

Increasingly there are competing and conflicting demands for space and resources in the UK marine environment, from renewable energy and aggregate extraction to fisheries, tourism and marine recreation. This increases the risk of one activity or sector coming in to conflict with another, or otherwise compromising the ability of a given sector to maximise its potential activity, inevitably resulting in decreased economic value of the sector. It also increases pressure on marine ecosystems potentially resulting in a decline in their services and the socio-economic value derived from them.

Until recently, the market could not be relied upon to deliver the best solution to this problem. Existing structures do not easily permit licensing authorities and other decision-makers to take account of externalities imposed by different marine users upon each other, as well as upon wider society. The information available is often inadequate to enable decisions regarding the use of the marine environment to be properly informed.

A wide range of potential approaches to address this problem have been consulted on in several public consultations since 2002. Through this process, it was concluded that there was a case for government intervention. The chosen approach was to introduce a more integrated forward-looking policy and evidence driven approach to decision making. The intervention primarily came in the form of the Marine and Coastal Access Act 2009 (MCAA). The MCAA introduces provisions for a system of spatial planning for the marine area in the UK. Marine planning follows a similar approach to terrestrial planning; setting the direction for decision making at a local level, to lead to rational and sustainable use of our marine resources. The MMO, vested on 1st April 2010, is developing marine plans for each of the proposed eleven marine areas in England.

[2] http://www.navitusbay.com/

In the following sections, the two key aspects of the MCAA which relate to marine planning are outlined in further detail.

1.2 Marine Policy Statement

The Marine Policy Statement (MPS) (Defra, 2009) sets out the UK high-level marine objectives (HLMO) and broad outcomes for the marine area in achieving this vision, and reflect the principles for sustainable development.
The key aims of the MPS are to (Defra, 2009 p 3):

- Promote sustainable economic development;
- Enable the UK's move towards a low-carbon economy, in order to mitigate the causes of climate change and ocean acidification and adapt to their effects;
- Ensure a sustainable marine environment which promotes healthy, functioning marine ecosystems and protects marine habitats, species and our heritage assets; and
- Contribute to the societal benefits of the marine area, including the sustainable use of marine resources to address local socio-economic issues.

1.3 Marine planning system

Marine planning is following a similar approach to terrestrial planning; setting the direction for decision making at a local level to lead to efficient and sustainable use of our marine resources. Marine planning aims to (Defra, 2009 p 4):

- Achieve integration between different objectives;
- Recognise that the demand for use of our seas and the resulting pressures on them will continue to increase;
- Manage competing demands on the marine area, taking an ecosystem-based approach;
- Enable the co-existence of compatible activities wherever possible; and
- Integrate with terrestrial planning.

Marine plans formulate and present objectives for the marine plan areas, providing guidance to help direct decision-makers, users and other stakeholders towards more strategic and efficient use of marine resources.

These objectives aim to deliver the HLMOs described in the MPS and are supported and informed by evidence relevant to the plan areas. Marine plans identify policies to manage marine resources and activities. They aim to provide a clear, spatial and locally-relevant expression of policy, implementation and delivery. They also aim to ensure that different and potentially competing activities are managed in such a way that they contribute to sustained economic development in the future, and the achievement of sustainable development. A key principle will be to promote compatibility of activities and reduce conflict between them.

2 South Inshore and South Offshore Marine Plans

Following the publication of the final East Inshore and East Offshore marine plans in 2014, the South Inshore and South Offshore Marine Plan Areas have been selected

as the second areas in England for which marine plans are to be developed. The South Inshore area includes a coastline that stretches from Folkestone to the River Dart. In the following sub-sections, the plan objectives and options for implementation are outlined.

2.1 Plan objectives

The plan objectives provide the context for the development of options (as discussed in Section 2.2) and are presented in Table 1. To improve the measurability of marine plan objectives, the Marine Management Organisation intends to define SMART (specific, measureable, achievable, relevant and time bound) objectives .
There are, however, a number of ways by which this could be achieved. The objectives in Table 1 have been through several revisions and are yet to be finalised. They are therefore still in draft format, with refinements expected according to comments received during the consultation on the South Marine Plan Areas Options Report which ran from early February to early March 2015 (MMO, 2015). Table 1 is based on the objectives as presented in the Options report (MMO,2015).
Past experience suggests that, due to the nature of the issues to be addressed, available evidence and stakeholder appetite, the plans are likely to comprise a combination of objectives that follow the SMART format and some that are broader, although it remains to be seen where the balance lies.

Table 1: Summary of Revised Draft Objectives[3]

ID	Objective
Objective 1	To reduce contributory drivers[4] of climate change that result from human activities through specific action to minimise and mitigate emissions of greenhouse gases
Objective 2	To reduce the environmental, social and economic risks of climate change, activities should take account of adaptation and mitigation measures, that reduce (net) vulnerability and/or improve resilience to climate and coastal change
Objective 3	To support the objectives of Marine Protected Areas and the delivery of an ecologically coherent network by ensuring enhanced resilience and the capability to adapt to change
Objective 4	Activities within and adjacent to the South marine plan areas must take account of the achievement or maintenance of Good Environmental Status (GEnS) and Good Ecological Status (GES) under the Marine Strategy Framework Directive and Water Framework Directives respectively
Objective 5	To safeguard space for the natural marine environment to enable continued provision of ecosystem goods and services
Objective 6	Disturbance impacts on mobile species, within or reliant on the South marine plan areas, resulting from new proposals and existing activities must be avoided, minimised or mitigated

[3] These objectives have since changed, but are presented here as they were used during the project.
[4] Contributory drivers are defined as the human controlled influences that contribute towards a rapidly changing climate. Specifically, those contributions originating from marine activities and their associated terrestrial infrastructure (e.g. port operations).

Objective 7	Cumulative impacts affecting estuarine water quality within the South Inshore Plan area should be addressed through strategic management addressing terrestrial and marine drivers
Objective 8	Displacement of marine activities should be avoided, minimised or mitigated in order to achieve a net gain in social benefits (especially to coastal communities)
Objective 9	Maintenance and enhancement of access to, and within, the South plan areas (that is appropriate to its setting and equitable to users) will be supported
Objective 10	Features significant to the historic environment of the South marine plan areas, that are not designated as heritage assets, should be identified and conserved
Objective 11	Decisions should consider the seascape of an area, and its constituent marine character and visual resource
Objective 12	To provide space to support existing, and facilitate future sustainable economic activity through the encouragement of colocation, mitigation of conflicts and minimisation of development footprints
Objective 13	To manage existing, and where appropriate facilitate the provision of new, infrastructure which supports marine and terrestrial activity incorporating resilience to the effects of climate change where appropriate
Objective 14	Regeneration and investment in, and diversification of activities which improve socio-economic conditions in South plan coastal communities will be supported
Objective 15	To support marine activities that create and enhance employment opportunities at all skills levels, particularly where this reflects existing or developing skills among the workforce of coastal communities using the South marine plan areas

Source: (MMO, 2015)

2.2 Plan options

The plans are currently in development and therefore there are a number of approaches and options available to develop the final version of the plans. Through the development of options, draft plan policies are produced. These can then be assessed in terms of their expected impacts, including the examination of types and combinations of policies, and the evidence can then be used to substantiate a preferred option.
The MMO has designed three different plan options, distinct from one another in the way that they use a different combination of policies to achieve the marine plan objectives. The South Marine Plan Areas Options Report (MMO, 2015) describes each option as follows:

1. *A high strength option that includes the highest possible number of high-strength policies. To enable compatibility of high strength policies, some require clauses allowing an applicant to state the case for proceeding with a proposal even when it does not conform with a policy. There is no guarantee that if a case is stated, it will be successful. This is because the high-strength policies require a greater level of consideration of other policies than medium*

and low-strength policies do. This means that greater weight may be attached to any impacts identified. This should lead to a relatively greater degree of certainty that the intent of the policy and its desired outcome will be realised in most, but not all, cases.

2. *An option that looks to find the middle ground across objectives (and therefore contains primarily medium strength policies). This option most closely resembles the East Inshore and Offshore Marine plans, in terms of phrasing and strength of policies and in terms of the likelihood of the outcomes gained from the policies. As the strength of requirements in the policies are less than those in option 1, there is more chance that a case can be made to proceed with a proposal or activity even if it is not in line with a policy. Therefore outcomes from the policies are less certain and there may be more scope for variation in how they are applied.*

3. *An option that seeks to be more prescriptive and looks to achieve more certain outcomes for issues that have been highlighted as being particularly important for the South marine plan areas. These primarily relate to:*

   a) the protection of the environment (both for its intrinsic value, the ecosystem services it provides and to help sectors reliant upon it for some of their appeal, such as tourism and recreation),

   b) a number of sectors of very high economic or social importance, namely:

      i. Tourism and recreation

      ii. Shipping

      iii. Fishing

      iv. Aggregates

      v. Ports

   Policies under this option provide the highest degree of certainty of outcome for the sectors and topics above, by removing the opportunity to state the case for proceeding when not in line with the policy. In so doing, it means that other sectors and topics can only be compatible with the above sectors and topics through use of a lower-strength policy that places fewer requirements on the decision maker and/or applicant in its implementation.

A further scenario that requires consideration is the Business as Usual (or 'do nothing') scenario. This acts as the baseline option whereby none of the three options outlined above are introduced and is outlined in more detail in Section 4. It is possible that a combination of one or more options currently presented could be developed as the preferred option for development of marine plans.

3 Methodology for Assessment of Impacts

In the following sub-sections, the methodology for assessing the costs and benefits to industry of each policy option contained in the South Marine Plan Areas Options Report is presented alongside the approach to the development of the baseline. The impacts assessed have been categorised into the following three types:

- Administrative impacts;
- Economic impacts; and
- Environmental impacts.

All costs and benefits have been estimated over the 20 year lifetime of the model, from 2016/17 through 2035/36 and are expressed as the Net Present Value (NPV) for the period.[5] A discount rate of 3.5% was used to calculate NPV in line with the HM Treasury Green Book (HM Treasury, 2003). All costs and benefits, irrespective of the year to which they are related, are expressed in real 2015 terms.

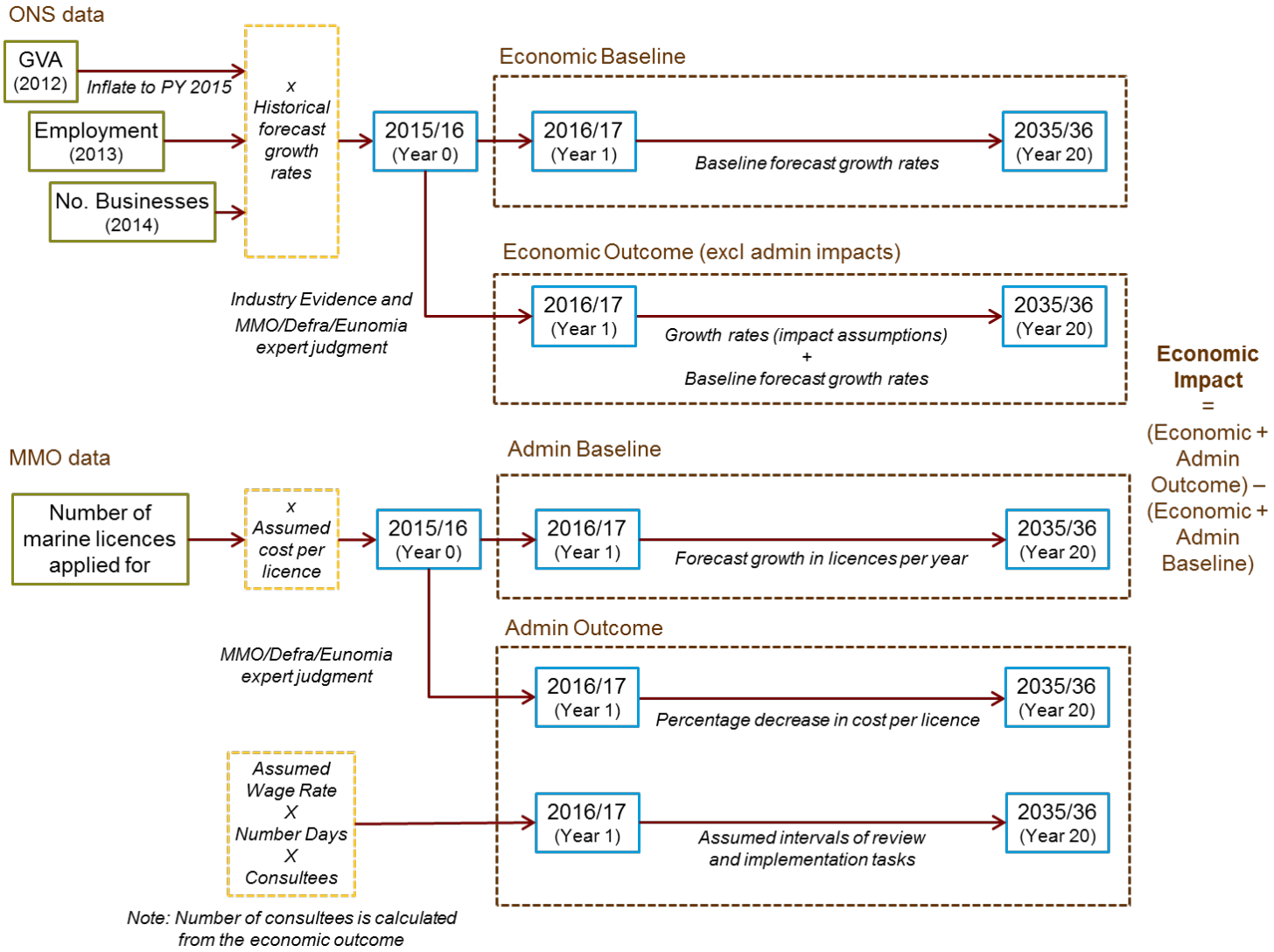
The costs and benefits represented here do not include the cost of businesses reviewing the plan options, as these are considered 'sunk costs'. As this assessment is only concerned with the impact on businesses, no costs or benefits have been estimated on other bodies such as the MMO, local authorities or other key organisations involved in the development or monitoring of the plans.

It is noted that administrative impacts are already included within the baseline GVA figures for each sector, as they are an economic impact. This is due to the calculation method used for GVA, which incorporates costs associated with wages and salaries. However, for the purposes of this assessment, administrative impacts have been calculated separately from the economic impacts – the assumed sectoral GVA growth rates resulting from the plans therefore do not include administrative impacts, so adding the economic 'outcome' and the administrative impact together does not result in 'double counting'.

The methodology for assessment the economic impact is shown diagrammatically in Figure 1 and explained in the following sections.

[5] NPV expresses the value of a series of costs and benefits over a given period of time in 'today's terms' reflecting the way the value of money changes over time, or the discount rate.

Figure 1: Diagram of Economic Impact Assessment Methodology



3.1 Baseline development

The costs and benefits for the marine plans considered in this economic assessment are measured against a baseline. The baseline is, in effect, a prediction of how the marine areas will develop over a 20 year period in the absence of marine plans in the South Inshore and Offshore area. As described in the following sections, the methodology for developing the baseline chiefly builds on two previous reports: *Economic Baseline Assessment of the South Coast* (MMO, 2013b) and *Exploring the Potential of Using Office for National Statistics (ONS) Data for Marine Planning* (MMO, 2014a).

Given the length of time over which the baseline extends, there is significant uncertainty surrounding the accuracy of the assumptions used to define it. Exogenous factors cannot, by their nature, be accurately forecast and no attempt to include such effects is included within the modelling. To mitigate against such factors, most macro-economic forecasting rarely aims to predict beyond a five year time horizon, but the aim here is not to seek to forecast the future perfectly, but rather, to compare one future scenario against another.

For this assessment, it is necessary to consider impacts over a longer timescale. Forecasts within the baseline are made on best available evidence and in alignment with published Government policies and industry plans. It should be noted that for the purpose of this assessment, the accuracy of the baseline is, arguably, less important than a reasonable identification of the likely deviation from the baseline by the marine plans.

3.2 Economic indicators and data sources

There are a number of difficulties involved in seeking to determine the socio-economic impact related to activities which take place in the marine environment. Not least of these difficulties, especially in respect of this research, is trying to understand the extent of current activities within the plan area.
For this assessment, we have sought to present three different types of socio-economic data on a sector by sector basis, these are:

- The Gross Value Added (GVA);
- The number of businesses; and
- Employment.

The following sub-sections seek to summarise each of these indicators.

3.2.1 Gross Value Added

This is an indicator relating to the value of goods and services produced in the economy. Fundamentally, GVA represents the difference between the revenue from selling a product (Output) and the costs associated with its production (Intermediate Consumption). GVA is published publically by ONS at regional (NUTS1) and sub-regional levels (both NUTS2 and NUTS3), and broken down by high-level SIC Code Sections. The data for this assessment was collected from the Annual Business Survey database, for which the most recent data available is for the calendar year 2012.

3.2.2 Number of businesses

This is an indicator relating to the number of organisations responsible for the level of economic activity. ONS data is available on the number of businesses in the UK, and published at the regional (NUTS1) and sub-regional levels (both NUTS2 and NUTS3), and broken down into SIC Code Sections. Detailed information about the types of businesses and their size is not publicly available. This data was collected through NOMIS, a service provided by the ONS which gives free access to detailed and up-to-date UK labour market statistics from official sources. Data on number of businesses was derived from the UK Business Counts database for the calendar year 2014.

3.2.3 Employment

This indicator includes employees plus the number of working business owners. Working owners are typically sole traders, sole proprietors or partners who receive drawings or a share of the profits. Data at the 5-digit SIC code level was obtained through Nomis, sourced from the Business Register and Employment Survey (BRES), for the calendar year 2013. BRES includes self-employed workers as long as they are registered for VAT or Pay-As-You-Earn (PAYE) schemes. Self-employed people not registered for these, along with HM Forces and Government Supported trainees, are excluded.

3.2.4 Sector-specific data sources

While data concerning the relevant economic indicators for Aggregates, Aquaculture, Coastal Tourism, Coastal Protection, Dredging, Fisheries, Marine Recreation, Ports, Oil and Gas, Shipping and Telecommunications sectors were obtained as outlined in the above sections, those for the Military Defence and Renewables sectors were not. The reasons for this, and alternative sources of data used for these sectors, where relevant, are highlighted in the following sections.

Military Defence
While ONS data concerning the number of businesses and employment in the Defence sector are available for the 5-digit SIC code industries defined, the nature of economic activity in this sector is not one that is readily amenable to measurement through metrics such as GVA, as the output and activity from the sector is often sensitive and/or confidential. As a result, GVA in this sector has not been quantified in this analysis.

Renewables
With respect to the Renewables sector in the South Marine Plan Areas, the methodology of sectoral mapping using 5-digit SIC code industry classifications in Section 3.2.5 was deemed inappropriate. First, ONS data on the economic indicators in this sector are suppressed to avoid issues of public disclosure of the output of individual businesses (because the number of businesses is small). Additionally, the 5-digit SIC code industries defined under this sector are not representative of the economic activity of interest in the region as they do not distinguish between renewable and non-renewable electricity generation, and will therefore likely include onshore generation as well as offshore. Offshore renewable generation is currently confined to two proposed offshore wind farm zones (Navitus Bay and Rampion) and one proposed tidal array demonstration facility (Perpetuus Tidal Energy Centre). Key

features of these three projects are included in Table 2. Additionally, the Crown Estate has leased the seabed for a further tidal energy project, Portland Bill (Marine Current Turbines, 2014); however, as no Environmental Impact Assessment (EIA) has yet been submitted for this project, it has not been included within the assessment as it is deemed too immature.

Table 2: Key Characteristics of South Plan Areas Renewables Projects

Feature	Navitus Bay Wind Farm	Rampion Wind Farm	Perpetuus Tidal Energy Centre
Expected Capacity	970 MW	400 MW[6]	20 - 30 MW
Expected Construction Start Date	2017/18	2015/16 (Second half)	2016/17
Expected Operation Start Date	2022/23	2018/19 (Second half)	2019/20

As a result, the analysis of the sector is focused on the economic impact of these three projects. The outcomes of the analysis for the baseline are outlined in Section 4.1.1

3.2.5 Baseline data modification

The marine planning process depends on a wide range of data, which must be presented spatially, temporally and sectorally so that total and distributional socio-economic impacts can be assessed.

The approach to obtaining and adapting the data has followed the methodology described in the MMO's report *Exploring the Potential of Using Office for National Statistics (ONS) Data for Marine Planning* (MMO, 2014a). This method ensures that the data selected relates to, and quantifies, each sector highlighted in the Marine Policy Statement, so as to show the activity taking place in each marine plan area. Additionally, the selected data is available on a recurring, rather than on a one-off basis, so that ex-post assessment of the marine plans can be more easily undertaken.

Spatial data

The South Marine Plan Areas are illustrated in Figure 2. In order to obtain data specific to this region, several factors were taken into account. Though the ONS publishes a number of data sets at the NUTS1 regional level of detail, the mapping between the boundaries of these regions and the adjoining South Marine Plan areas is poor. A further challenge arises from the fact that our principal concern is with areas directly affected by changes in the South Marine Plan areas, which are likely to be those closest to the sea. The NUTS1 areas include substantial inland areas. LAU1 data are therefore more useful for marine planning areas. Local authority boundaries can be mapped closely to the adjoining marine plan areas, while the extent of the inland areas caught within local authority level data is considerably

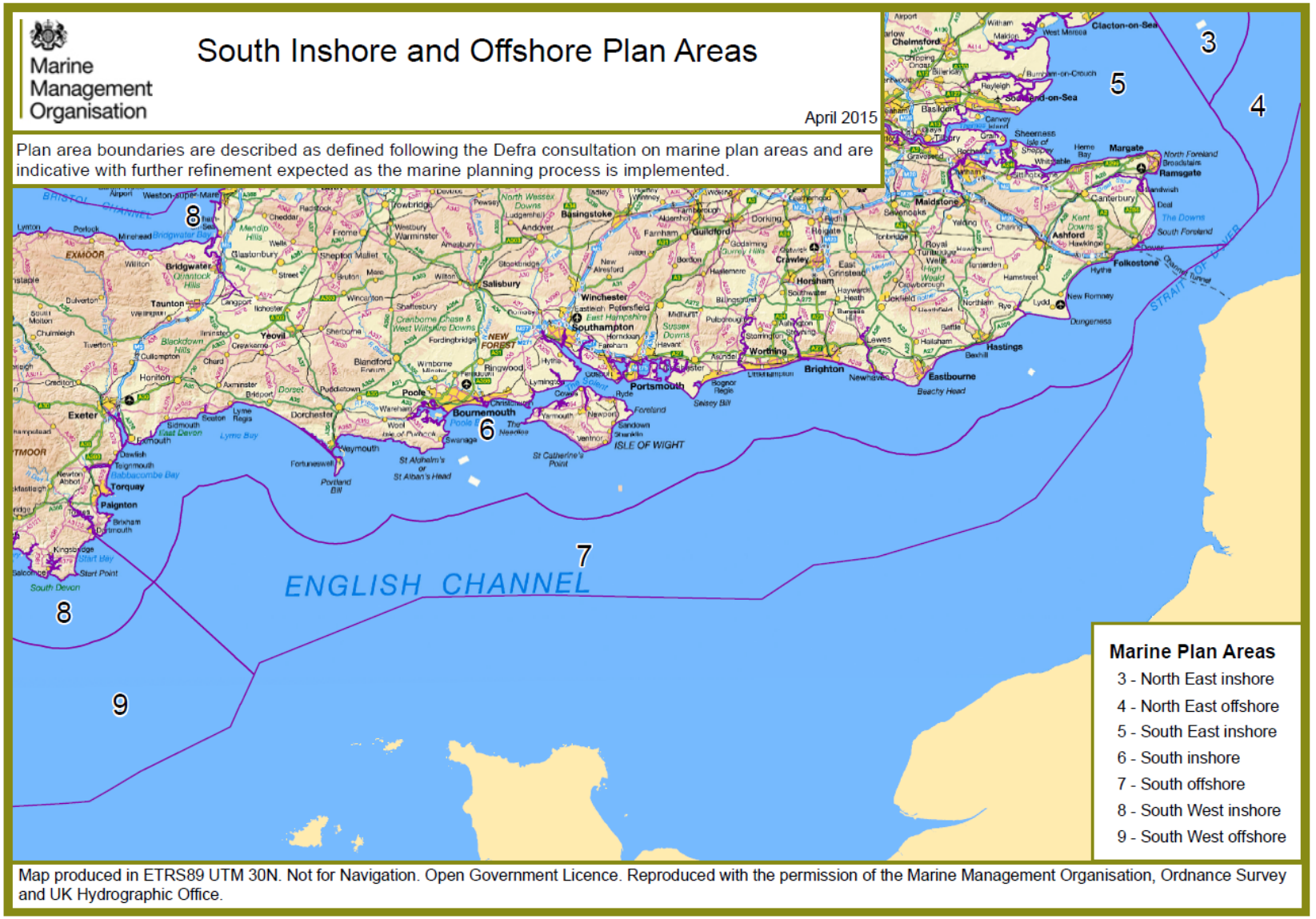
[6] Although E.ON received planning permission for 700 MW of capacity, as set out in the Secretary of State's decision on a Development Consent (DECC, 2014), the final design is for 400 MW of capacity (E.ON UK, 2014).

smaller, reducing the requirement for the use of apportionment methods in order to focus on the relevant communities and businesses. Table 6 in the ONS data report (MMO, 2014a) maps the LAU1 data to the South Marine Plan Areas.

Temporal data

A key challenge in this study was collecting data that are recurring, to allow indicators to be monitored over the lifetime of the plans, and for improvements to be made that are consistent and comparable with previous findings. ONS data were selected for use in this case as they are gathered on an annual basis, using consistent methodology, allowing MMO to be confident that it will be able to obtain the information needed to produce consistent findings over time. For each economic indicator specified (see Section 3.2), the most recent data was obtained, and, where necessary, forecasting techniques using the best information available were applied.

Figure 2: South Inshore and Offshore Plan Areas Map



Source: Marine Management Organisation

Sectoral data
The marine based sectors each hold a great deal of social, economic and environmental importance for the marine plan areas and are comprised of a large number of diverse activities. Accordingly, they are separately identified in the MPS. This study uses the United Kingdom Standard Industrial Classification (SIC) of Economic Activities to identify different economic sectors within the marine environment. The new version of SIC codes (SIC 2007) was adopted by the U.K. from 1st January 2008. They divide industries into broad groupings or 'sections', which are then further subdivided through a multi-digit classification system.
The most detailed level available, and the level used for this analysis, is 5-digit SIC codes, which specify quite narrow areas of economic activity. However, the codes do create certain data issues, as not all the marine sectors can be clearly mapped even to 5-digit SIC codes. An inclusive mapping between these codes and the marine sectors is included in Table 1 in the ONS data report (MMO, 2014a).

Data apportionment
Data are currently collected in a way that allows Office for National Statistics (ONS) statisticians to identify, with reasonable accuracy, the relevant indicators for land based activities. However, there is need to identify an approach that enables the attribution of specific activities that take place in the marine environment to be accounted for in a consistent way.

Whilst the use of local authority boundaries and 5-digit SIC codes enables data to be prepared that more closely approximates the information needed for marine planning, the match is not perfect. It is important to consider and address the remaining issues, and any areas where additional data may be needed to ensure that wherever possible the data prepared closely reflects the social and economic impacts of marine activities.

Towards this end, no **geographic apportionment** has been applied to the data in this project, despite the fact that many of the authorities included within consideration have extensive inland areas, and the greatest impact of marine activities may be expected to be felt near the coast. This is in line with the MMO's view that for the purposes of marine planning, it would not be proportionate to seek to further sub-divide the local authority areas adjoining marine plan areas.

Sectoral apportionment, however, has been identified and applied to the data to account for the fact that some SIC codes are included within multiple sectors; some codes may be more relevant than others; and some SIC codes appear likely to include some activity that relates to onshore activities.

Explanations of the steps needed to refine and apportion the SIC code definitions for the South Marine Plan Areas is provided in Table 5 in the ONS data report (MMO, 2014a).

Ports and shipping
Because of the overlap in the 5-digit SIC code sub-sectors under Ports and Shipping sectors, the methodology used for sectoral apportionment deviates slightly from that used for other sectors. In order to avoid a misrepresentation of the level of economic activity in the industries classified under these sectors, we applied separate

apportionment rates to each of the economic indicators of concern, hence providing a more accurate picture of the contribution of each sub-industry to the sector as a whole, and hence to the South Marine Plan area in general.

The individual apportionment rates applied were calculated using the proportionality principle. Using data obtained by unique analyses conducted in the MMO report titled *Economic Baseline Assessment of the South Coast* (2013
b) we were able to establish, for each indicator, the ratio of economic activity in the shipping sector to that in the ports sector. This ratio was then applied as the percentage of apportionment to the data related to each SIC code. The apportionment data obtained using this method is given in Table 3 below.

Table 3: Ports and Shipping - Apportionment by Economic Indicator

Economic Indicator	Apportionment	
	Ports Sector	Shipping Sector
Number of Businesses	38%	62%
Employment	45%	55%
Gross Value Added (GVA)	58%	42%

3.3 Assessing economic impacts associated with the plans

The methodology used to assess the economic impacts must be relevant and appropriate to the types of impacts associated with the marine plans. Many of the impacts associated with marine plans will be associated with providing greater certainty and clarity to industry on their current and future marine activities. The economic impacts associated with these changes are by their nature difficult to quantify, as there is no direct market value related to either aspect. However, it is possible that the resulting certainty and clarity will result in different investment decisions being made. Specifically, it is expected that the following impacts may be seen as a result of the plans:

- Planned development brought forward in time;
- Planned development pushed further back in time;
- New development facilitated;
- Productivity of the sector increase;
- The magnitude/scale of existing activities increased; or
- The magnitude/scale of existing activities reduced.

It is noted that many of the impacts will be focussed on the supply-side rather than on the demand-side.
Depending on the type of impact, these have the potential to influence all three of the economic indicators described in Section 3.2.

3.3.1 Policy scoping

In order to assess the economic impacts of the plans, structured qualitative telephone interviews were held with stakeholders to discuss the potential impacts of the marine plans on each sector. Although this method required a significant time commitment with regard to data gathering, a bottom-up approach was chosen as it allowed for a stakeholder-driven insight into market trends, attitudes and anticipated

behavioural reactions to the plan options – thus allowing a more accurate forecast of impacts. Although obtaining information from each individual organisation within the plan area was implausible, contact was made with a variety of different stakeholders with the aim of speaking with one or two businesses and organisations per economic sector.

The large number of policies contained under each plan option meant that it was unfeasible to engage with stakeholders on every aspect of each option. The first stage in this process was therefore to scope out the policies that were most relevant to each sector. Policies that directly reference an economic sector either in the name (for example, policy S-AGG-1b is relevant to the Aggregates sector) or in the policy text (policy S-BIO-2a references recreational boat fouling and is therefore relevant to marine recreation) were mapped against the relevant sectors. Policies that were not deemed to be directly relevant to a specific sector were categorised as 'General Policies'. The output of this exercise can be seen in Table 12 in Annex 1.

3.3.2 Interviews with stakeholders

The policy scoping exercise determined the content of the interviews, with each interview topic guide tailored to the specific sector. Any policies that were judged to be directly relevant to a sector were discussed individually. Conversely, general policies were discussed more broadly in the context of the plan options.
Stakeholders were also asked how they thought their sector would develop without a marine plan in place (baseline scenario) and whether they had identified any other specific policies in the plan options (such as those directly relevant to another sector) that they thought could have an economic impact on their sector. A list of the organisations interviewed is presented in Annex 1.

During the interview, stakeholders were first allowed to answer the initial question posed so that their answer was open and spontaneous. If they were not able to answer the question, or required some direction, the interviewer used a carefully chosen selection of prompts to guide the discussion. These helped keep the focus of the interviews on economic impacts and away from other aspects of the options development process that the stakeholder felt was pertinent.
A high level breakdown of the discussion points in each interview is given below:

1. Introduction
2. Interviewee background information
3. Understanding of the impact on the economic sector
    - Baseline scenario
    - Impact of sector-specific policies
    - Impact of policies specific to other sectors
    - Impact of non-sector specific (general) policies

The information captured form the interviews was recorded in fieldwork notes and consolidated in summary impact tables. The key role of these tables was to synthesise the information captured from stakeholders on the impact of sector-specific policies, policies specific to other sectors and general policies on the economic sectors. This then formed the basis for estimating the growth rates for each plan option over the 20 years of the plan.

3.3.3 Limitations of interviews

The aim of the interviews was to gather views from stakeholders to inform the assumptions about the impact of the marine plans on each economic sector. The interview process captured a range of insights from a wide variety of stakeholders. There were, however, certain limitations inherent to the process which should be mentioned and are discussed in the following paragraphs.

Due to a variety of factors, interviewees often found it difficult to discuss the plans in the context of their socio-economic impacts. Many of the interviewees had responded to the consultation on the South Marine Plan Areas Options Report (MMO, 2015) which ran from February to early March 2015 or had attended one of the related workshops. The close proximity of this research to the consultation period may have made it difficult for interviewees to draw a distinction between the two processes and focus solely on the socio-economic impacts of the plans. Furthermore, some may have felt that the interviews provided a timely opportunity to influence the MMO and the policies or plan options themselves.

The narrow differences between some of the policy variants may also have meant stakeholders found it challenging to engage with the aims of the interview. In many cases, the difference between a high and low strength policy was one or two words. It is perfectly understandable that some stakeholders did not have the necessary legal background required to distinguish between ‘should,’ ‘will’ and ‘must’ despite clarification.

In other cases, interviewees felt that that the ambiguity of the language used in the policies meant that they were unable to fully comprehend the policies and therefore could not discern any impacts stemming from their introduction. Compounding this was the difficulty in forecasting any impacts of the plans for the full 20-year period.

The limitations discussed above posed challenges to the collection of relevant data that could be used to inform the assumptions. Efforts were made to minimise and mitigate these potential issues using interview techniques such as prompts to guide the discussion at times of digression. A detailed introduction was also given by the interviewer to ensure that the interviewee was fully aware of the purposes of the study and the desired outputs.

3.4 Confidence in economic data

Quantitative data

The information sources provided for the economic indicators within each sector have been given a confidence rating. The rating is based on the overall confidence assessment ratings of the data source and takes into consideration the following:

- The reliability and quality assurance processes at the information source;
- The date of the information source;
- The spatial location of the data source;
- The methodology and techniques used to gather the data; and
- The applicability of the activities covered by the data to the activities defined for each sector.

The confidence rating system used within this assessment is qualitative, ranking our level of confidence in the outputs at each stage of the methodology as high, medium, or low. At each stage, the rationale behind the assignment of these ratings has been provided, both for the quantitative and qualitative data utilised in the baseline analysis. A summary of confidence ratings in this analysis is given in Table 4.

Qualitative data

We assign a high level of confidence to the sources and nature of data used for the qualitative assessment of the current levels of activity (as detailed in Section 4.1). The assessment synthesises the findings of three core projects commissioned by the MMO regarding each of the sectors in the South Marine Plan Areas, and was further built on using primary data from stakeholder engagement across the sectors under study. In terms of projecting likely future activity, however, we face the same uncertainty and complexity in analysis as in the treatment of quantitative data, and have hence assigned low and very low confidence ratings as the period of projection increases.

Note that while the confidence ratings summarised in Table 4 are representative of those sectors for which data was readily available, they do not apply to those highlighted in Section 3.2.4.[7]

[7] Given that support services for marine defence activities are well-established in the South plan areas, ONS data on the number of businesses and employment did not seem representative of the level of activity in the region, and possibly underestimate the same due to the confidential nature of military defence activities. Details regarding defence-related economic activity that is clearly present in the plan areas are outlined in the MMO report titled *Economic Baseline Assessment of the South Coast* (2013b). Our confidence assessment in the quantitative data gathered for this sector, therefore, is low.

Table 4: Summary of Confidence Ratings Applied to Data Treatment

Type of Data	Data Gathered	Source & Nature of Data	Time Relevance of Data	Sectoral Apportionment	Historical Forecast to Year 0	Projection - Year 1-5	Projection - Year 5-10	Projection - Year 10-20
Quantitative	Gross Value Added	Very High	Medium	Medium	Low	Low	Very Low	Very Low
	Number of Businesses	Very High	Very High	Medium	Medium	Low	Very Low	Very Low
	Employment	Very High	High	Medium	Low	Low	Very Low	Very Low
Qualitative	Type of Activity	Very High	High	N.A.	N.A.	Low	Very Low	Very Low
	Policy Direction	Very High	High	NA	N.A.	Low	Very Low	Very Low
	Market Potential	Very High	High	N.A.	N.A.	Low	Very Low	Very Low
	Socio-economic Factors	Very High	High	N.A.	N.A.	Low	Very Low	Very Low

3.5 Administrative impact calculations

The methodology for estimating the administrative impacts of the marine plans is described in the following section. The costs and benefits are considered under two separate categories:

- Impacts associated with a change in the cost of applying for a Marine Licence[8]; and
- The administrative burden associated with the implementation and reviews of the plans.

Impacts associated with the change in the cost of applying for a Marine Licence have been calculated using a Eunomia assumption about the percentage change in the total cost. The baseline for the assumed cost of applying for a Marine Licence has been adapted from previous impact assessments related to marine planning, while the number of licences made by industry per year has been forecast on the basis of data provided by the MMO on applications for marine licences made in previous years in the South plan areas.

The administrative burden associated with the implementation and reviews of the report have been assessed using the Standard Cost Model (SCM) methodology (Better Regulation Executive, 2005). The SCM methodology is a way of breaking down the impacts of regulation into manageable components that can be measured. The costs have been calculated using the following formula for each activity:

Cost/Benefit of Activity = Price * Quantity
= (Wage Rate[9] * Time[10]) * (Population[11] * Frequency[12])

3.6 Environmental impact calculations

In recent years, there have been a series of attempts to clarify the ways in which humans benefit from natural resources and environments. The diverse range of benefits that we derive from the natural environment comes from ecosystem services.[13]

Examples of these services include the supply of food and water (provisioning services); the regulation of climate, water quality and flood risk (regulating services); opportunities for recreation, tourism and education (cultural services); and essential underlying functions such as soil formation and habitat for wildlife (supporting services).

Whilst some of these services have a direct market value, there are a number for which valuation is difficult, especially in the marine environment. Additionally, due to the spatial scale of this assessment (relating only to the South Inshore and Offshore marine plan areas), there is a lack of reliable evidence which can enable valuation of

[8] It is recognised that there are a range of permits and permissions that businesses must seek prior to commencing activity in the marine environment. For the purpose of this assessment only the impacts associated with the Marine Licence has been calculated.
[9] The costs associated with the person undertaking the activity including on-costs.
[10] The period of time associated with undertaking the activity
[11] The number of persons undertaking the activity.
[12] The amount of times the activity is undertaken.
[13] Ecosystem services include ecosystem stocks (e.g. fish), processes and/or functions (e.g. carbon sequestration) that are directly or indirectly consumed by people.

the entire suite of services since values of this nature may be highly location specific (so approaches based upon benefits transfer may have limited validity).
Table 5 summarises some of the key ecosystem services, alongside where such services are quantified in this assessment.

Table 5: Simplified Ecosystem Service Framework

Ecosystem Service	Type of Service	Method of Assessment	Comments on Quantification
Food Provision	Provisioning Service	Commercial Fishing and Aquaculture	Quantified in the economic assessment
Water	Provisioning Service	Water Quality	Not quantified in this assessment
Climate change regulation	Regulating	CO_2 Emissions	Not quantified in this assessment
Flood risk	Regulating	Flood protection	Not quantified in this assessment
Habitat Provision	Supporting Services	Biodiversity	Not quantified in this assessment

Source: Adapted from Defra's introductory guide to valuing ecosystem services (Department for Environment, Food and Rural Affairs, 2007)

4 Baseline

4.1 Current activity

For each sector discussed in this report, a comprehensive review of existing literature was conducted to aid a detailed assessment of the current state of business activity in the South Marine Plan Areas. Previously published MMO research outputs were prioritised for this review, which provided clear qualitative insight into key economic drivers such as:

- Historical trends;
- Resource distribution and output potential;
- Policy direction;
- Socioeconomic descriptors;
- Infrastructure and technological development; and
- Geospatial considerations.

Three primary sources of information for this review were the *South Inshore and South Offshore Marine Plan Areas: South Plans Analytical Report (SPAR)* (MMO, 2014b), the *Economic Baseline Assessment of the South Coast Report* (MMO, 2013b) and the *South Marine Plan Areas Futures Analysis* (MMO, 2013a). The findings in these three reports were considered to provide a comprehensive and relevant qualitative baseline and this project therefore did not attempt to update the qualitative baseline.

4.1.1 Renewables

As discussed in Section 3.2.4, the Renewables sector comprises two offshore wind farms, Navitus Bay and Rampion, and one tidal energy facility, Perpetuus Tidal Energy Centre. The direct number of businesses in this sector is therefore maintained at three throughout the duration of the baseline. It is recognised, however, that a number of other businesses may be indirectly impacted by the construction and operation of the wind farms and/or tidal energy facility (for example in turbine assembly).

Direct employment for the three projects were calculated on the basis of information published by the developers of Navitus Bay and Rampion wind farms (Eneco New Energy & EDF, and E.ON, respectively) and Perpetuus Tidal Energy Centre within their respective EIAs. Due to a higher demand for labour during the construction phase, it is estimated that 465 FTEs for the Rampion wind farm (E.ON UK, 2014), a maximum of 433 FTEs for the Navitus Bay wind farm (Navitus Bay Development Limited, 2014) and 46 FTEs for Perpetuus (Perpetuus Tidal Energy Centre, 2014) would be required during this stage of the development. As the projects become operational, the level of employment associated with the developments is expected to decrease. For the Rampion wind farm, the level of employment during operation is expected to be 65 FTEs, for the Navitus Bay wind farm, it is expected to be 190 FTEs, whilst for Perpetuus it is expected to be 40 FTEs.

In order to calculate the expected economic activity, a unique assessment of these three projects was undertaken to ascertain the contribution of this sector to employment and GVA in the South Marine Plan Areas. Data on the expected local

GVA impact of Navitus Bay (Navitus Bay Development Limited, 2014) was used to estimate the GVA of Rampion. Data was also available on the expected local GVA of the Perpetuus operational stage; this was used to estimate the GVA of the construction stage. The 20-year NPV of the GVA for the sectors is estimated to be £576 million.

4.2 Baseline growth rate assumptions

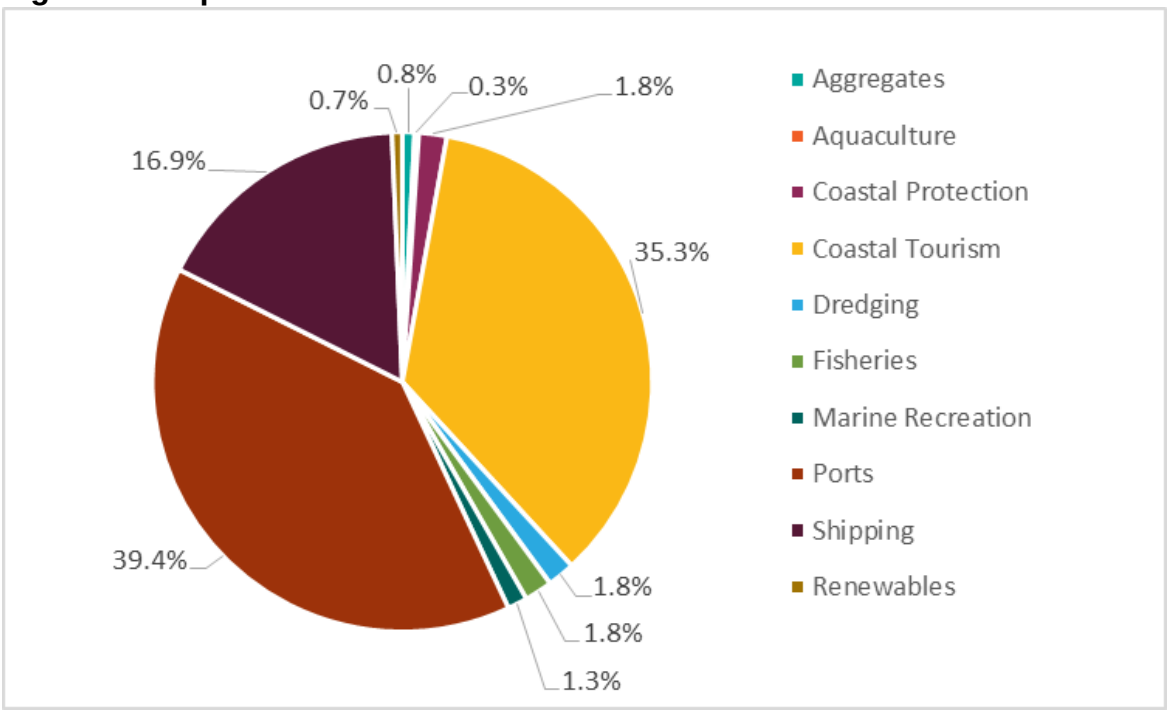
In order to establish the 'Business-As-Usual', or Baseline Scenario for Comparison against each of the Proposed Plan Option Scenarios, it was necessary to estimate and project sectoral growth rates for each economic indicator across the lifespan of the Marine Plan. Using the findings from Section 4.1, and incorporating industry-based growth projections where appropriate, predictions regarding the industry baseline growth rates were made, assuming an absence of major economic shocks. The detailed findings of this estimation are provided in Table 15 in Annex 3. These growth rates were then used to calculate the expected GVA, number of businesses and employment for each sector, in the absence of the marine plans. The high-level outputs of this analysis are shown in Sections 4.3 and 4.4.

4.3 Summary of current economic activity

4.3.1 Gross Value Added

The total GVA for the marine economy in the South plan areas across all sectors in 2015/16 (year 0) is forecast to be £1.373 billion.
The key sectors contributing to the total GVA of all sectors include coastal tourism, which represents around 35.3% of the total GVA (£484 million), ports, which represents 39.4% of the total GVA (£541 million), and shipping, which represents approximately 16.9% of the total GVA (£232 million). This is shown in Figure 3.

Figure 3: Proportion of GVA for Each Sector within the Plan Areas in 2015/16[14]

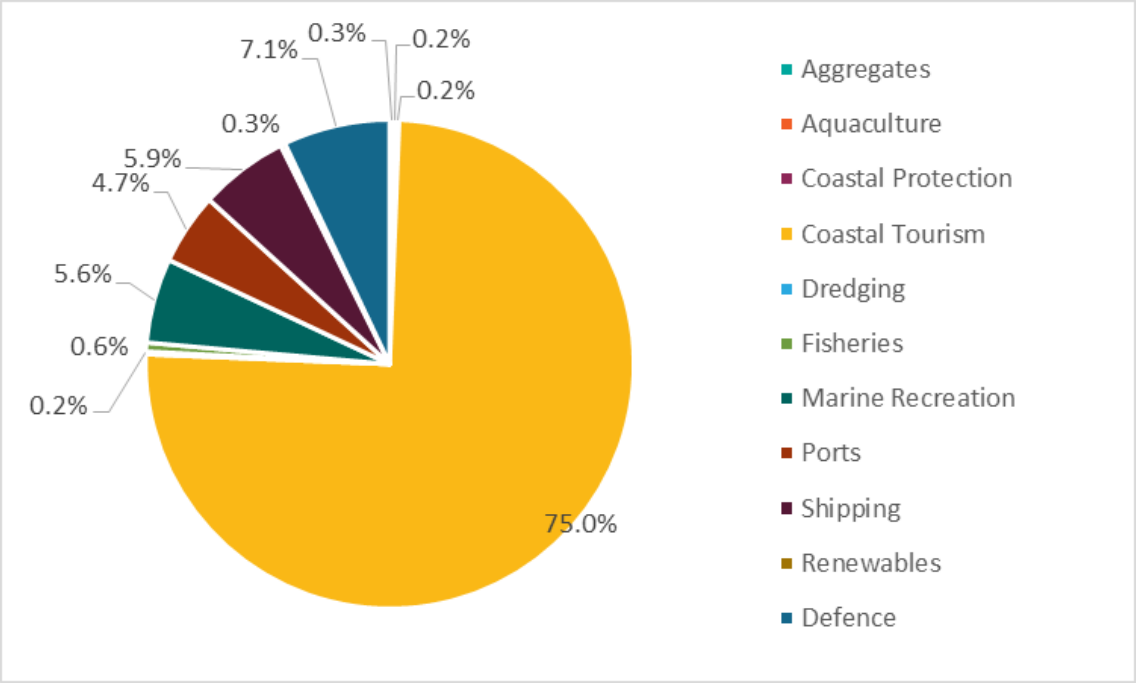


[14] This does not include GVA data for military defence due to lack of quantitative information. Furthermore, oil & gas and carbon capture and storage are not included as their value in the areas is 0.

4.3.2 Employment

For 2015/16, a total number of 67,258 employees were estimated to be working within the marine plan areas. Coastal tourism is forecast to be the largest contributor within the region with 50,426 employees, 75.0% of the total number of employees. Next in order, defence accounted for 4,749 employees, 7.1% of the total number of businesses.[15] The third largest sector is shipping with 3,953 employees, 5.9% of the number of businesses. This is shown in Figure 4.

Figure 4: Proportion of Number of Employees for Each Sector within the Plan Areas in 2015/16[16]

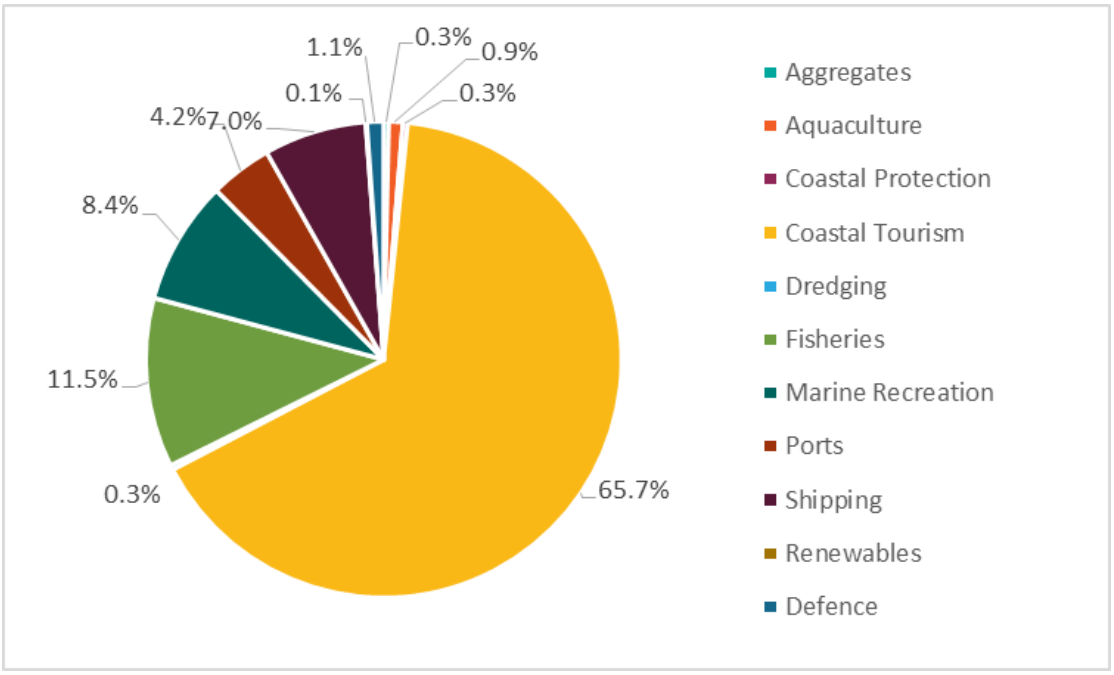


[15] However, see footnote in Section 3.4 on uncertainties surrounding the figures related to the defence sector.
[16] Oil & gas and carbon capture and storage are not included as their value in the areas is 0.

4.3.3 Number of businesses

For 2015/16, a total number of 3,964 businesses were estimated in the marine plan areas. Coastal tourism is forecast to be the largest contributor within the region with 2,600 businesses, 65.7% of the total number of businesses. This is reflective of the importance of tourism within the region and the plethora of restaurants, hotels and others tourist attractions in operation. Next in order, fisheries accounted for 455 businesses, 11.5% of the total number of businesses. The third largest sector is marine recreation with 333 businesses, 8.4% of the number of businesses. This is shown in Figure 5.

Figure 5: Proportion of Business Counts for Each Sector within the Plan Areas in 2015/16[17]



[17] Oil & gas and carbon capture and storage are not included as their value in the areas is 0.

4.4 Summary of future economic activity

4.4.1 Gross Value Added

Over the first six years of the marine plan (through 2021/22) the total GVA across all of the sectors is projected to increase at an average year-on-year growth rate of approximately 1.46%. For the remaining fourteen years of the marine plan (from 2022/23 to 2035/36), the total GVA is expected to increase at an average year-on-year growth rate of 1.28%. This means that the total GVA increases from £1.389 billion in Year 1 to £1.498 billion in Year 6 and £1.789 billion in Year 20.

4.4.2 Employment

Between 2015/16 and 2021/22, the total number of employees in the plan areas is projected to grow by 0.27% year-on-year to 68,354 employees. Within these years, the peak in employment in the Renewables sector is forecast to take place in 2018/19 when 738 employees are forecast within this sector. This is due to the construction of two offshore wind projects and a tidal energy project, all of which will increase the number of employees in the Renewables sector. From 2021/22 through 2035/36, the year-on-year growth rate is expected to be 0.25%, leading to a Year 20 employment figure of 70,765 employees.

4.4.3 Number of businesses

In the first six years of the plan, from 2015/16 to 2021/22, the number of businesses is expected to increase to 4,019 in Year 6, a year-on-year growth rate of 0.19%. In the remaining years of the plan, a year-on-year growth rate of 0.28% is expected, leading to a total number of businesses active in the area to 4,170 by Year 20. The difference in the growth rates is largely driven by the increase in year-on-year growth rates for the ports and shipping sectors from 1.5% in Years 1 – 5 to 2.0% in Years 6 – 20.

5 Assessment of Impacts

The introduction of marine plans for the South Inshore and Offshore plan areas is expected to deliver a number of impacts both within and outside of the plan areas themselves. The marine plans will provide guidance to help direct decision-makers, users and stakeholders towards more strategic and efficient use of marine resources. This will result in administrative impacts for all sectors, as well as economic and social impacts on the majority of the marine sectors in the area. In the following sub-sections, an assessment of the costs and benefits associated with the marine plans is presented where they can be quantified. Unquantified impacts are also identified where they are expected to be significant.

Within each plan option, three scenarios have been modelled to provide a low, a medium and a high growth scenario. The low scenario is seen as the worst-case scenario, where the impact of the marine plans is little to none, or, in some particular sectors, even negative. The high scenario is the best-case, where the impact of the plans is positive across most sectors and activities and thus results in additional growth above and beyond what would have been expected. The low and the high scenarios can be taken together to form a range of the plausible impacts associated with the plans. The medium scenario is the best estimate of the impact; thus in some cases the medium scenario may not always be equidistant to the low and high scenario.

All statements and figures quoted should be read in the light of the considerable uncertainty that surrounds predictions of economic impacts made over a 20 year time period. Furthermore, the nature of the wording used in the plan options and policies, as well as the still novel concept of marine plans, is such that it is incredibly difficult to predict with certainty what impact each of the plan options may or may not have. The range between the low and high scenarios, as described above, is therefore very large for some plan options. This reflects the limits of what possible impact (both negative and positive, compared to the baseline) we believe the South marine plans can have.

5.1 Administrative impacts

Administrative impacts associated with implementation and review are expected to be experienced by industry through the following two activities:

- Consideration of the plans, once published, within their organisations (taking place in year 1); and
- Involvement in consultations on review of the plans over their lifetime (taking place in years 3, 6, 9, 12, 15, 18 after the publication of the plans).
- In order to calculate the costs, a variety of assumptions have been used:
- An average day rate of £182.40, using Eunomia assumptions and the results from the Annual Survey of Hours and Earnings (ONS, 2014) for Environment Professionals;
- The proportion of businesses in the South marine plan areas assumed to take part in each activity is 4.8%. This is based on information from the MMO about the participation rate in the South marine plan options consultation

process, the total number of businesses in the South marine plan areas in year 0 (2015/16) of the baseline and Eunomia assumptions;
- Consideration of the plan is assumed to take 2 days per organisation; and
- Review of the plan is assumed to take 5 days per organisation.

Furthermore, administrative impacts, in the form of reduction in costs for the preparation and administration of marine licences, are also expected to have the potential to occur. Between 2011/12 and 2014/15 (inclusive), the MMO received an average of 120 marine licence applications within the South plan areas each year. These were for a range of activities, including construction works, disposal of dredged material and removals, and included applications in bands 0 through 3 as well as a small number of licences of an unknown band. Both the total number of licence application submitted per year and the four-year average distribution of licences across the bands has been extrapolated to provide the 20-year baseline for marine licences submitted by industry.

The baseline cost to industry associated with the administrative burden of making applications for marine licences has been estimated by applying an average cost to industry for each band of licence type. This is based on several previous reports and models completed by Eunomia, summarised in the report entitled *Economic Baseline Assessment of the South Coast* (MMO, 2013b). A full list of the assumptions used to calculate the costs are outlined in Annex 2.

The introduction of the balanced and prescriptive marine plan options is considered to result in savings associated with the costs of marine licence applications due to the additional certainty provided by the plans. This may either result in a reduction in the number of failed applications submitted and/or a reduction in the effort (in terms of time taken) for the application to be prepared, due to the applicant having a better understanding of the requirements for a marine licence being granted. The savings associated with both of these possibilities are represented by a percentage saving on the cost associated with making a licence application.

A single percentage savings has been applied to all fee bands, though the percentage ranges from 0% for all scenarios under the Flexible plan option (due to the vague nature of the language of the policies as drafted) to 3% savings for the high scenario in the Flexible and Prescriptive plan options. The full set of percentage savings assumed are outlined in Annex 2.

The total NPV of both the cost of review and implementation of the plans and the savings associated with reduced licencing costs are outlined in Table 6 for each of the three plan options and the three scenarios.

Table 6: Administrative Impact of South Marine Plans

Plan Option	Scenario	Total 20 Year NPV of Administrative Impact
Balanced (1)	Low	-£17,264
	Medium	£4,924

	High	£15,984
Flexible (2)	Low	-£17,258
	Medium	-£17,273
	High	-£17,480
Prescriptive (3)	Low	-£17,075
	Medium	£4,926
	High	£15,981

Notes:

The calculations for review and implementation activities are based on an assumed day rate of £182.40; an average consultation time of 2 days per consultee for the implementation activities (in year 1) and 5 days per consultees for the review activities (in years 3, 6, 9, 12, 15, 18). It is assumed that 4.8% of the businesses in the South plan areas will engage in both activities.

The calculations for savings associated with marine licence applications are based on percentage savings applied to the baseline cost of making an application, which is between £3,033 and £82,605 (including EIA costs) per licence in 2015 prices. The total number of licence applications made per year is 120.

5.2 Economic and social impacts

The following section outlines the assumptions about growth or decline in each sector due to the three marine plan options.
For each sector within each plan option, three modelling assumptions have been made to provide a low, a medium and a high growth scenario, as described in Section 5. The full set of assumptions, including the low and high scenarios are available in Table 16, Table 17 and Table 18 in Annex 4.

The growth rate assumptions have been compiled from a combination of the stakeholder interviews, and our interpretation and understanding of the baseline (see Section 3.1). In order not to risk identifying any stakeholders who have contributed to the research, assertions made in the following report sections about the likely impact on particular sectors have been deliberately kept vague so that their source cannot be identified.

The growth rates included in this section are year-on-year growth rates and **are in addition** to the growth rates expected in the baseline. For example, for a sector where the baseline growth rate is 1% year-on-year growth over the 20 years and the assumption about the impact on a sector is listed as 2% year-on-year growth, the total growth rate of the sector will be 3% year-on-year. The net impact is calculated as the difference between the baseline and the modelled expectations for the sector under each of the three scenarios and each plan option.

Unless otherwise stated, the growth rates are assumed to be the same for all three economic indicators: GVA, number of businesses and direct employment. For some sectors, a transitional period has been applied, as the impact is not expected to be seen immediately upon introduction of the marine plan. The transition time varies for each sector, as it is dependent upon on how reactive a sector is considered to be. For example, sectors whose development mainly takes the form of large-scale investments in new infrastructure would be assumed to have a longer transition time than a sector where development takes the form of new activities or new small businesses. For each sector where a transition time has been applied, the growth rate during the transition time varies from 0% (for sectors with a growth rate of 1% for duration of the plan) to between one third and a half of the growth rate seen for the duration of the plans.

A summary of the total figures for all sectors is included in Section 5.3.

5.2.1 Aggregates

Our research has suggested that the Aggregates policies for each of the plan options are broadly similar to the current situation and therefore not likely to result in a major impact. Furthermore, it was felt that the policy variants under consideration are similar to one another to the extent that no distinct economic impacts could be identified.

The prioritisation of the Aggregates sector under the Prescriptive option could lead to a greater number of exploration and extraction licenses being awarded in the plan areas. By contrast, the high prioritisation also placed on the environment and competing activities could impose restrictions on development. The growth of the sector under this option therefore depends on the extent to which the dredging of aggregates is given prioritisation over other activities.

Conservative growth rates were therefore applied across the plan options and different scenarios.

It is estimated that the impact on the Aggregates sector, in the medium scenario, will range from 0% for the Flexible (1) and the Balanced (2) plan options to 1% year-on-year growth for the Prescriptive (3) option.

5.2.2 Aquaculture

Aquaculture is considered to be a key area for development by UK administrations due to its potential to contribute to the sustainability and security of the UK food supply.

There is an important link between water quality and the development of the Aquaculture sector. The higher strength policy variants under Options 1 and 3 are more likely to ensure that water quality is of the requisite quality for organisms to reproduce and grow and therefore aquaculture to develop and thrive. However, the more prescriptive nature of the same policy variants could be prove difficult for the sector as it is rapidly developing. As with the Fisheries sector, development of the industry is also closely linked to changes in wild fisheries, site availability and the availability of capital for investment.

These linkages and uncertainties associated with the sector make it difficult to predict with accuracy the effect of the plan options. It is therefore estimated that the impact on the sector, in the medium scenario, will range from 2% additional growth for the Balanced plan option (1) to 1% for the Flexible plan option (2) and 0% year-on-year growth for the Prescriptive option (3).

5.2.3 Carbon Capture and Storage

The lack of viable opportunity for Carbon Capture and Storage (CCS) in the plan areas means that this sector is unlikely to develop during the timespan of the plan. Although there are potential storage sites off the South Coast, the lack of a cluster of large scale CO_2 emitters means that it is unlikely that any of these sites will be developed, regardless of the marine plans. It is therefore estimated that the impact of the plans on the CCS sector will be 0% across the three options.

5.2.4 Coastal protection

Although the need for coastal defence measures in the plan areas is likely to increase due to the threat of rising sea levels and erratic weather associated with climate change, the plan options appear unlikely to have a significant impact on the development of infrastructure. Further to this, the stakeholder interviewed in relation to coastal protection felt that it was not possible to discern any differences between the three options that could have a potential impact on the sector.

It is therefore estimated that the impact on the coastal protection sector will be 0% in the medium scenario across the three plan options.

5.2.5 Coastal tourism

The coastal tourism sector has strong links with the marine recreation sector in the way that it shares many of the same policies under the plan options. The sectors are also closely linked to physical aspects such as water quality and seascape. As such, the impacts are thought to be broadly similar.

The breadth of activities within the sector make it one of the most dynamic in the plan areas. The type of growth expected to come from the protection of the sector under the plan options might include a growth in demand for hotels and similar accommodation, camping grounds, restaurants and mobile food service activities, cultural activities, sports activities and amusement. There is no indication that new large developments will result from the introduction of the marine plans. Coastal tourism could also benefit from a growth in other sectors under the scope of marine planning. As these industries employ more people in the area they may take part in some or all of the activities listed above. However, it is not likely that all growth in employment will lead to more tourism, as some may use the proximity of the South Coast to London or other attractions as an opportunity to travel elsewhere.

It is expected that the Prescriptive option of the marine plan will lead to additional growth in the sector, due to the protection of its interests, such as access to the marine environment, against other proposals. However, there is also the potential for negative impacts on the sector from the option's prioritisation of the environment. The Balanced option, where the policies supporting the sector are lower-strength, but where the additional environmental protection policies are also not as strong, is

also expected to result in additional growth. It is not felt that the lower-strength policies of the Flexible plan option will have any impact on the sector as it is not significantly different from the business as usual scenario.

It is therefore estimated that the impact on the Coastal Tourism sector, in the medium scenario, will range from 0% for the Flexible plan option (2) to 1% year-on-year growth for both the Prescriptive (3) and Balanced (1) options.

5.2.6 Dredging

Dredging policies under the plan options are understood to be broadly similar to the current situation. It was also felt that the policy variants under consideration are similar to one another to the extent that no distinct economic impacts could be identified. Despite this, the industry is closely linked with the ports sector as the main purpose of navigational dredging is to ensure that the depths of ports, harbours and navigational channels are maintained for vessels to navigate through. The growth rates applied to the dredging sector therefore echo those assigned to the ports sector, but are more conservative. Any growth (or otherwise) experienced by the ports sector is unlikely to be experienced at the same scale by the dredging industry, unless a significant amount of capital dredging is required (the amount of maintenance dredging is less likely to increase unless new ports are developed). Furthermore, unlike the ports sector, the high prioritisation placed on the environment and competing activities in the Prescriptive option could impose restrictions on dredging activities.

It is estimated that the impact on the dredging sector, in the medium scenario, will range from 0% for the Flexible (1) and the Balanced (2) plan options to 1% year-on-year growth for the Prescriptive (3) option.

5.2.7 Fisheries

The South marine plan areas are an important area for England's fishing industry; as they land more fish (both in terms of tonnage and value) than any of the other marine plan areas in England. Within the marine plan areas fisheries tend to be small-scale, with the majority of vessels being under 10m in length and working within the inshore plan area. Much of the fish landed in the South plan areas is sold in London where there is a high demand. Key commercial fishing ports in the plan area include Brixham, Shoreham, Newhaven, Portsmouth, Teignmouth, Weymouth, Poole, and Exmouth. Many other coastal towns support local fishing, such as Swanage, Portland, and Lyme Regis (MMO, 2013b).

Considering the impact of the plan options, our research has indicated that each of the plan options would lead to some additional growth in the sector. Key policies were deemed to be S-FISH-1c and S-FISH-2c which protect fishing habitats and fishermen's access to them. These high strength policies would help prevent the displacement of fishermen by competing activities such as the dredging of aggregates and yachting.

As with the Balanced option, it is estimated that the Prescriptive option will lead to a growth in the Fisheries sector. The addition of prescriptive strength policies under this option protect it further against competing activities and therefore build a

stronger case for its growth. By contrast, the high prioritisation also placed on competing activities such as the dredging of aggregates and marine recreation could impose restrictions on development. The growth of the sector under this option therefore depends on the extent to which fisheries are given prioritisation over the environment.

Although the policies under the Flexible option are weaker than under the Balanced and Prescriptive options, a positive growth rate is assigned to reflect the protective nature of the policies. The flexibility of this option could also lead to competition from conflicting activities, although it is unlikely that this will result in negative growth. It is therefore estimated that the impact on the Fisheries sector, in the medium scenario, will range from 1% for the Flexible plan option (2) to 2% year-on-year growth for the Balanced option (1) and 3% for the Prescriptive option (3). Under the Balanced option the sector is assigned a growth rate of 1% for the first three years of the plan and 2% for the remaining years.

5.2.8 Marine recreation

The type of impacts expected for the marine recreation sector include expansion or other development of marinas or other areas of current activities, the introduction of new activities, or (with the higher strength policies) possible relocation of activities from other marine plan areas. There is no indication that new large developments will result from the introduction of the marine plans. Due to the uncertainty about exactly what type of activities will be seen as part of this growth, it is not clear whether the growth will be in number of businesses, GVA, employees or increased productivity. In the absence of a clear indication, it is estimated that the growth rates will apply to all three of the economic indicators.

It is expected that the Prescriptive option of the marine plan will lead to growth in the sector, due to the protection of its interests, such as access to the marine environment, against other proposals. However, there is also the potential for negative impacts on the sector from the option's prioritisation of the environment. This is particularly the case for the S-BIO-2c policy which is thought to have the potential to stop new projects or expansion of activities from going ahead due to the additional burden of avoiding the introduction of invasive species. The Balanced option, where the policies supporting the sector are lower-strength, but where the additional environmental protection policies are also not as strong, is also expected to result in growth. The range of low to high values is greatest for the Prescriptive option, due to the potential conflict between the prioritisation of both the sector itself and the environment.

It is not felt that the lower-strength policies of the Flexible plan option will have any impact on the sector as it is not significantly different from the business as usual scenario.

It is estimated that the impact on the recreation sector, in the medium scenario, will range from 0% for the Flexible plan option (2) to 2% year-on-year growth for both the Prescriptive (3) and Balanced (1) options.

5.2.9 Oil & gas

Our research on the Oil & Gas sector identify a number of potential economic impacts stemming from the introduction of the marine plan options. These come from a wide range of policy areas including Climate Change, Aggregates and Displacement and have the potential to negatively impact the sector through the preclusion of its future development. The stakeholder identified the conflicting interests of the Aggregates and Oil & Gas sectors as having a particularly significant impact. As Aggregates policies (S-AGG-1 & 4) are currently worded (particularly in the Balanced and Prescriptive Options), future Oil & Gas exploration and extraction would be made incredibly difficult due to the prioritisation and protection of the exploration and extraction of aggregates.

However, despite the potential impacts that have been identified, because there is currently no oil and gas activity that can be exclusively assigned to the plan areas and, due to uncertainties surrounding future exploration and extraction, growth rates have not been applied going forwards.

5.2.10 Ports

Overall, our research does not suggest that many large development decisions (such as large-scale port expansions) will be taken on the basis of the marine plans, and growth rates expected for the sector are therefore determined more on the basis of what other sectors that interlink with ports may experience. However, on the whole, the impact of any of the marine plan options is expected to be limited due to the overall size of the ports sector and the permanence and established nature of ports, which already limits the potential for new developments in other sectors to have much impact.

The Prescriptive option is estimated to result in limited growth for the sector, as it prioritises the ports sector above other sectors; furthermore, the prioritisation of other sectors key to the development of ports, such as shipping, tourism and recreation, will also support growth for the ports sector. Examples of growth include: additional dredging activities to accommodate larger ships and the expansion of a particular part of a facility in response to new activities, such as offshore renewable energy developments. It is not expected that the marine plans will result in entire new ports being developed or that the size of the ports currently in the South marine plan areas will increase significantly.

As the Balanced and Flexible plan options do not prioritise the ports sector, no growth is expected to result from these. The medium-strength policy intended to reduce the impact of other proposals on the ports sector (PS-4b, which forms part of these plan options) may result in developments which would previously have involved negotiation between the relevant parties; as drafted, the policy allows proposals to go ahead if a 'case for proceeding' can be presented, which may bypass current negotiation practices.

It is estimated that the impact on the ports sector, in the medium scenario, will range from 0% for the Flexible (2) and Balanced (1) plan options to 0.5% year-on-year growth for the Prescriptive option (3).

5.2.11 Shipping

Shipping activities include sea and coastal freight and passenger transport and cargo handling. Ancillary activities that support the sector include the building and repairing of ships, the construction of water projects, navigation, pilotage and berthing, and storage and warehousing. Within the South marine plan areas, the English Channel links the North Sea to the Atlantic and is one of the busiest shipping arteries in the world. The South plan areas are also home to a number of significant ports, such as the Port of Southampton, which is the fourth largest port in the UK in terms of freight tonnage (MMO, 2013b).

It is perceived that the higher strength policies within the Balanced and Prescriptive options are more likely to lead to growth through the protection of the sector against competing developments (such as sea surface infrastructure) that may impact on navigation routes. Maintaining these routes would permit increased commercial and passenger vessel traffic through the plan areas in the case of increased demand. The inherent uncertainties behind the Prescriptive option means that it has been assigned the largest range of growth rates. The prioritisation of the Shipping sector under this option could protect current shipping routes and permit increased passenger and commercial vessel in the plan areas. By contrast, the high prioritisation also placed on the environment could impose restrictions on development. The growth of the sector under this option therefore depends on the extent to which shipping is given prioritisation over the environment.

The Flexible option is assigned a 0% growth rate in the medium scenario due to concerns from the stakeholder that the policies are based around existing activity; rather than discuss how routes will be grown, they focus on how they will be maintained. Weaker policies under this option expose the sector to threats from conflicting developments that may impact on shipping routes, which is why a lower growth rate has been assigned to this option in comparison to the Balanced option. It is estimated that the impact on the Shipping sector, in the medium scenario, will range from 0.5% for the Balanced (1) and Prescriptive (3) plan options to 0% year-on-year growth for the Flexible option (2).

5.2.12 Renewables

The impact of each of the plan options on the renewables sector is likely to be minimal. Under the Electricity Market Reforms (EMR) market forces are more likely to have an impact on its future development than the marine plans. Ongoing financial incentives including the Contract for Difference (CfD) will continue to stimulate growth in renewables, as government strives to meet decarbonisation targets, seeking an 80% reduction in carbon levels by 2050.

With regards to current projects, commercial scale marine renewable energy has not yet been developed in the plan areas. The Crown Estate announced the Round 3 Proposed Offshore Wind Farm Zones in 2010. Two of these zones are located within the South marine plan areas: Navitus Bay, off the coast of Bournemouth, and Rampion, off the coast of Brighton and Hove. Whereas the plan options might provide protection to projects in earlier stages of development, Rampion has already been granted a Development Consent Order and the decision on Navitus bay is due later in 2015, before a marine plan would come into effect. To date there has been

no suggestion of fourth licensing round and therefore additional offshore wind projects within the lifetime of the plan seem unlikely. Thus it is assumed that the marine plans will have no impact within the offshore wind sector.

Additionally, the South marine plan areas have potential for tidal energy facilities. Perpetuus Tidal Energy Centre has recently applied for planning consent for a project that could deliver up to 30MW around the Isle of Wight, while Marine Current Turbines (a subsidiary of Siemens) has recently been leased sea bed rights by the Crown Estate for exploring tidal energy south of the island of Portland in Dorset. As neither of these facilities have yet to receive consent (or, in the case of Portland, to have specific plans developed) and the Crown Estate have not established the method for leasing further areas of sea bed for tidal energy facilities, it is unclear what the future of tidal energy will look like in the South plan areas. It is therefore not possible to make assumptions on the impact of the South marine plans on tidal energy facilities.

5.2.13 Telecommunications

Like the renewables sector, it is estimated that there will be no impact associated with each of the marine plan options for the Telecoms and Communications sector. The policies specific to the sector are supportive of its development but do not necessary stimulate further growth. The small size of the sector and the nature of its potential growth – through expansion of capacity rather than the laying of new cables – mean that its interaction with other sectors is minimal. On this basis, no impact is forecast throughout the duration of the plans.

5.2.14 Military defence

Although future defence activities are difficult to predict, any future changes in the nature and level of defence marine activity is likely to be driven by strategic decisions taken at the national level by the Ministry of Defence. The marine planning process itself is unlikely to have great influence over the prevalence or location of defence-related activities.

5.3 Summary of impacts

This section summarises the impact of each of the South Inshore and Offshore Marine Plan options. Overall, all three plan options are, in the medium (or best case) scenarios, estimated to provide savings to industry beyond the baseline. The 20 year totals are summarised in Table 7 (figures shown are in comparison to the baseline) and shown graphically in Figure 6. For reference, a summary of the 20 year baseline figures (as also outlined in Section 4.4), is provided in Table 8.

Table 7: Summary of 20 Year Impact of All Marine Plan Options Compared to the Baseline (Medium Scenarios)

Indicator	Balanced (1)	Flexible (2)	Prescriptive (3)
Gross Value Added (NPV)	£791 million	£28.0 million	£1.05 billion
Number of Employees (Year 20)	12,495	97	12,918
Number of Businesses (Year 20)	919	91	1,041

Figure 6: Economic Forecast for Medium Scenario for all Plan Options: Total GVA per Year for all Sectors

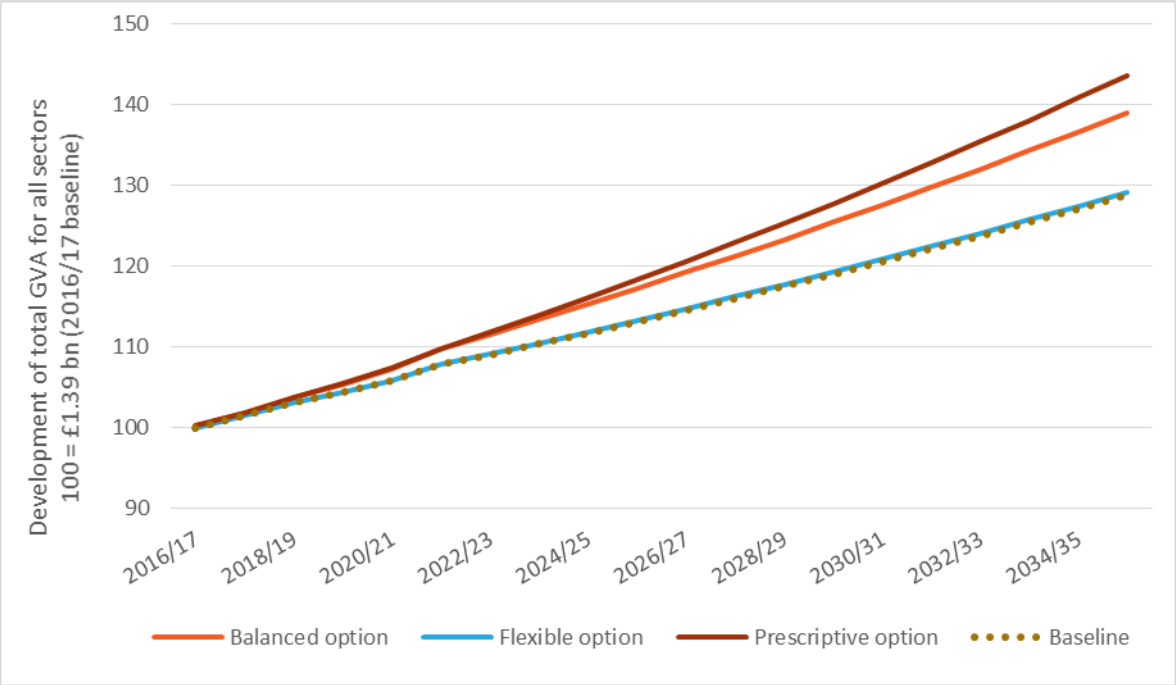


Table 8: Summary of 20 Year Baseline

Indicator	Baseline
Gross Value Added (NPV)	£1.79 billion
Number of Employees (Year 20)	70,765
Number of Businesses (Year 20)	4,170

The savings to industry ranges from £27.8 million (20 Year NPV) for the Flexible plan option to £1.05 billion (20 Year NPV) for the Prescriptive plan option in increased GVA compared to the baseline. The Balanced plan option is estimated to provide £791 million (20 year NPV) in increased GVA compared to the baseline. These figures incorporate both the administrative and the economic impacts.

In year 20, the marine plans are also estimated to result in increased employment and number of businesses in the marine plan areas. The Prescriptive option is modelled to have the largest potential, with 12,918 additional employees within the

fourteen sectors in year 20 and 1,041 additional businesses created in comparison to the baseline. In the Balanced option, these figures are 12,495 employees and 919 new businesses compared to the baseline, while for the Flexible option, it is a net increase of 97 employees and 91 businesses.

The following sections outline the low, medium and high scenarios the each of the marine plan options and discusses the main driving factors in the differences between the plan options.

5.3.1 Balanced plan option (option 1)

As described in Section 5.3, the Balanced plan option is estimated to provide a relatively large benefit across a number of sectors. This is due to the additional certainty that the plan policies provide in protecting future development across a number of different key sectors, including tourism, recreation, ports and shipping. The vast majority of the increase in GVA, employment and number of businesses is thus seen in these sectors.

As described in Section 5, there is a large degree of uncertainty over the figures quoted due to the difficulties in establishing the extremes of the potential marine plan impacts. Table 9 provides the range of figures from the low scenario to the high. In the low (or worst-case scenario), it is estimated that the plan could result in loss of GVA, employees and businesses across the sectors, compared to the baseline. This is driven by the ports sector, which is described as a sector which requires flexibility and which currently operates on the basis of ongoing negotiations with other sectors preparing activities within ports' areas of economic interest. There is therefore a concern that the marine plans could take the place of these negotiations and thus leave less scope for the development of ports.

Table 9: Summary of 20 Year Impact of Balanced Plan Option Compared to the Baseline

Indicator	Low	Medium	High
Gross Value Added (NPV)	-£1.21 billion	£791 million	£3.97 billion
Number of Employees (Year 20)	-1,339	12,495	29,952
Number of Businesses (Year 20)	-75	919	1,949

As shown in Figure 7, the range of the low to the high scenarios increases with time, with the largest uncertainty found within the year 20 figures due to the cumulative impact of applying year-on-year growth rates. In Year 20, the range from minimum to maximum is more than £9.5 billion (20 Year NPV), compared to the baseline.

Figure 7: Economic Impact of Balanced Plan Option: Additional GVA per Year Compared to the Baseline

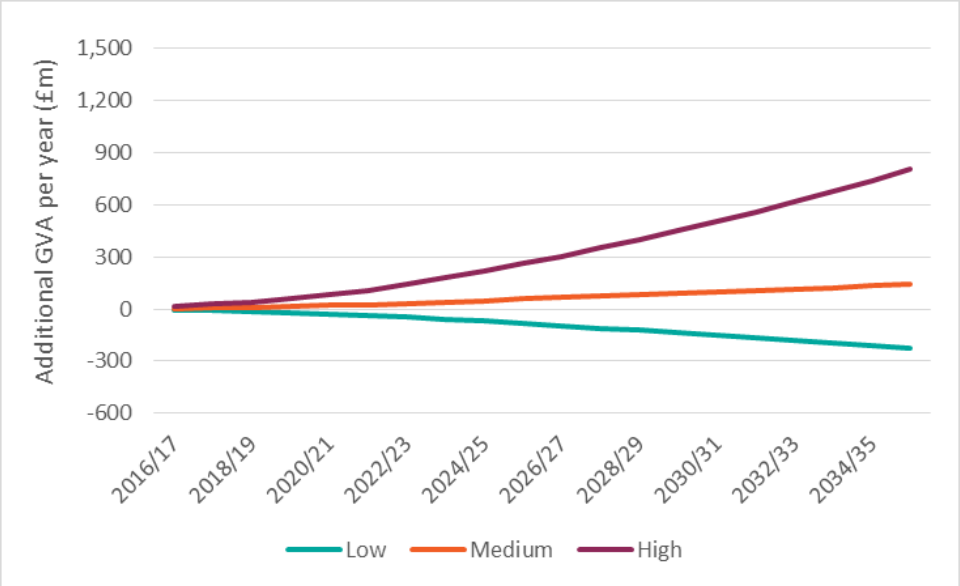
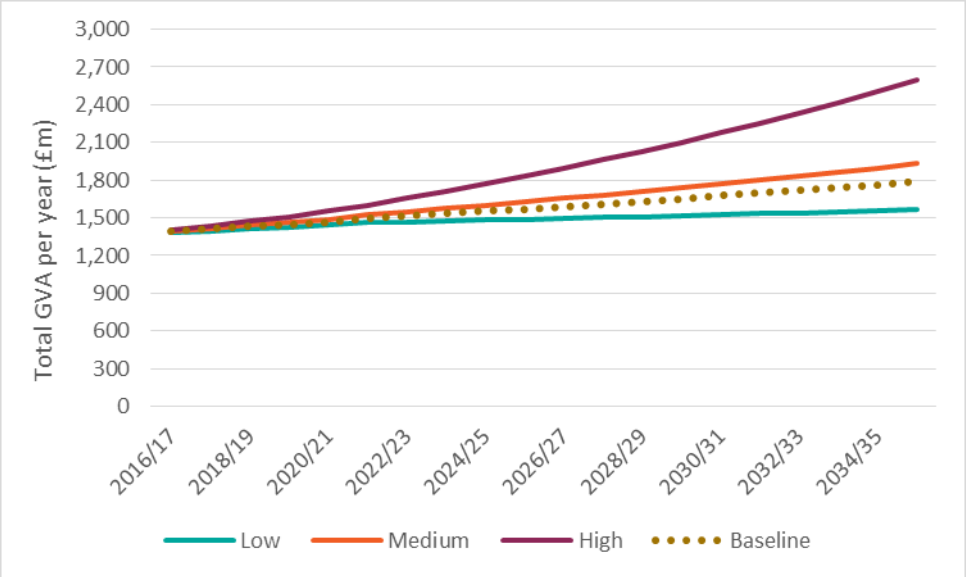


Figure 8 shows how the total GVA of all sectors under each scenario for the Balanced plan option, and the baseline, develops over the 20 years. This shows that even under the low scenario, the sectors will still experience net growth from year 0.

Figure 8: Economic Outcome of Balanced Plan Option: Total GVA per Year



5.3.2 Flexible plan option (option 2)

The Flexible plan option is estimated to provide only modest savings to all sectors. This reflects the overall low strength of all policies under this plan option and the lack of certainty over both how they will be interpreted and whether they will be of high enough strength to result in any economic impact at all. In fact, the only two sectors which are expected to benefit from these policies in the medium scenario are the fisheries and aquaculture sectors. These sectors are particularly dependent upon high water quality and it is thus thought that the policies in the Flexible plan option

which are intended to protect the environment will, despite being low-strength, be of benefit to these two sectors.

In the medium scenario, the net increases in employees and number of businesses compared to the baseline are very similar figures. This is due to the number of small operators working in these sectors.

It should be noted that, despite the medium scenario indicating limited impact, the plan option is modelled to have the potential to provide either negative or much greater positive growth in the low and high scenarios, respectively. The range of the low to high scenarios is significant, with a 20 Year NPV range of more than £1 billion. This indicates the vast uncertainty expressed through the research of how low-strength policies will be implemented and interpreted. Table 10 shows the low to high range of all three economic indicators and Figure 9 shows how the total GVA develops (additional to the baseline) over each of the three scenarios.

The loss to the sectors, compared to the baseline, in the low scenarios reflects the same concerns around the impact on the ports sector as under the low scenario of the Balanced plan option (see Section 5.3.1). Furthermore, in the worst case scenario, the shipping sector may experience a decline (compared to the baseline, which expects the sector to grow over the 20 year timeframe) due to concerns that the policy options do not adequately protect potential future shipping routes.

Table 10: Summary of 20 Year Impact of Flexible Plan Option Compared to the Baseline

Indicator	Low	Medium	High
Gross Value Added (NPV)	-£1.72 billion	£28.0 million	£3.01 billion
Number of Employees (Year 20)	-2,977	97	16,448
Number of Businesses (Year 20)	-151	91	1,245

Figure 9: Economic Impact of Flexible Plan Option: Additional GVA per Year Compared to the Baseline

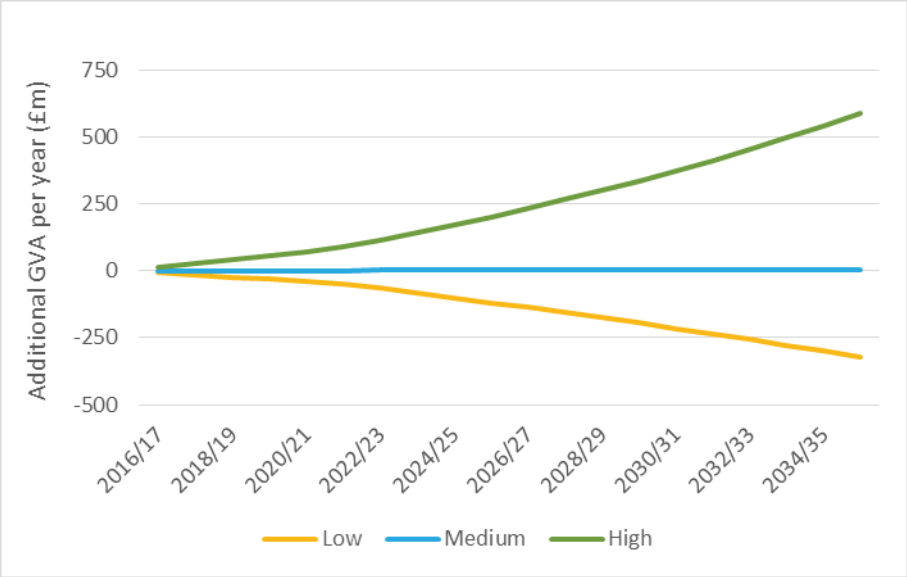
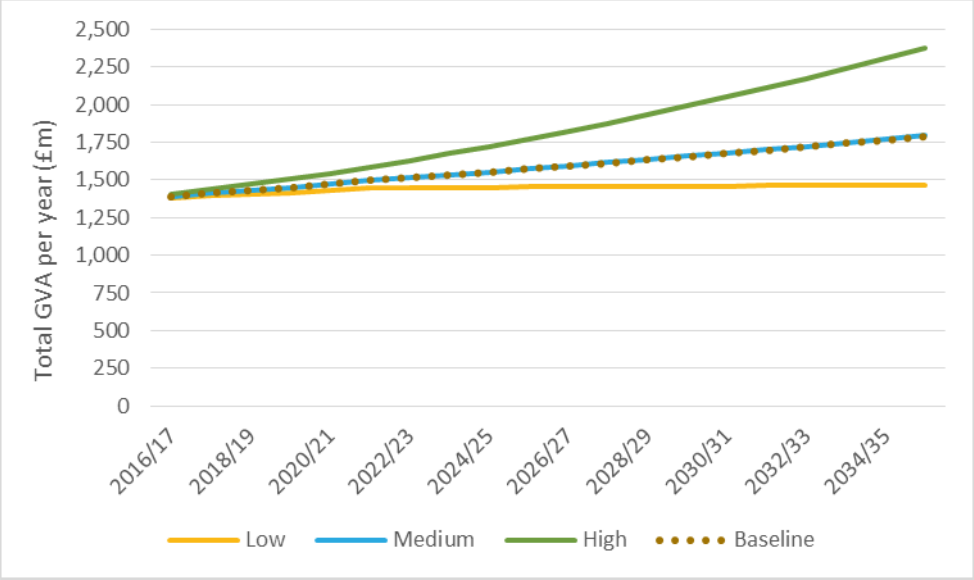


Figure 10 shows how the total GVA of all sectors under each scenario for the Flexible plan option, and the baseline, develops over the 20 years. This shows that even under the low scenario, the sectors will still experience net growth from year 0.

Figure 10: Economic Outcome of Flexible Plan Option: Total GVA per Year



5.3.3 Prescriptive plan option (option 3)

As discussed in Section 5.3, the Prescriptive plan option is estimated to provide the highest increase in GVA (measured in terms of the 20 year NPV) in comparison to the baseline. This is due to the high strength policies for the key sectors also highlighted in Section 5.3.1, marine recreation, tourism, ports and shipping. These are all 'protected' by additional high-strength policies under this plan option; however the additional certainty provided by these policies is balanced against the additional uncertainty from to the prioritisation of the environment, also a feature of this plan option. As all of these sectors have the potential to develop in ways which would be

counter to the protection of the environment, where the balance between the prioritisation of the sectors and the protection of the environment lies is the single most important determinant in how large an impact the policies will have.
This is also shown in both Table 11 and Figure 11, where the large range between the low and high scenario outcomes is shown. The range of the impact on GVA compared to the baseline is the largest of any of the plan options, at more than £6 billion (20 year NPV). This is due to the prioritisation of the sectors with the largest economic presence in the South plan areas, including coastal tourism, ports, shipping and marine recreation. If the balance between each of these sectors and the environment falls in favour of the sectors, each of them could achieve significant growth above the baseline. On the other hand, in the worst case scenario, each of these sectors, apart from ports, could potentially experience a loss, compared to the baseline.

Table 11: Summary of 20 Year Impact of Prescriptive Plan Option Compared to the Baseline

Indicator	Low	Medium	High
Gross Value Added (NPV)	-£1.62 billion	£1.05 billion	£4.32 billion
Number of Employees (Year 20)	-18,773	12,918	44,813
Number of Businesses (Year 20)	-1,186	1,041	2,816

Figure 11: Economic Impact of Prescriptive Plan Option: Additional GVA per Year Compared to the Baseline

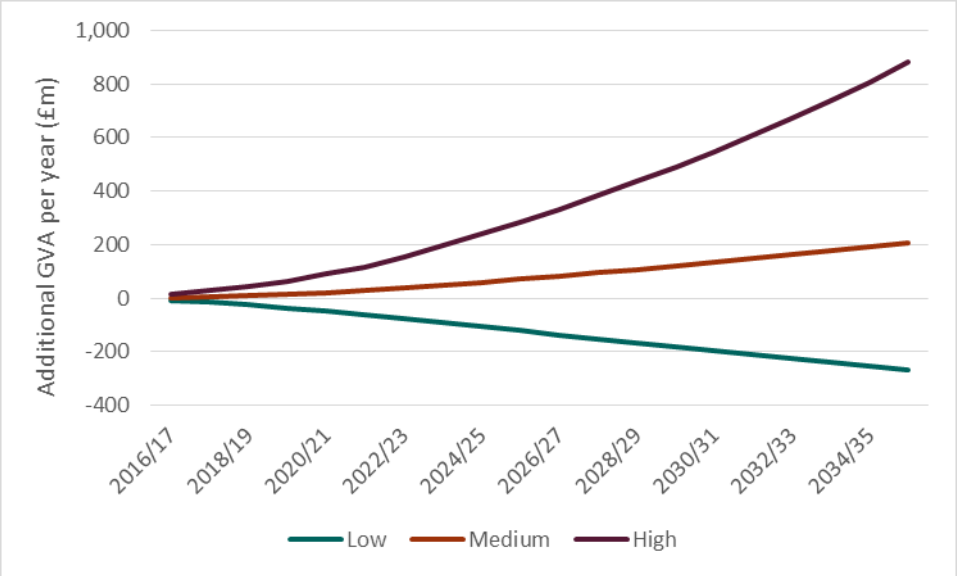
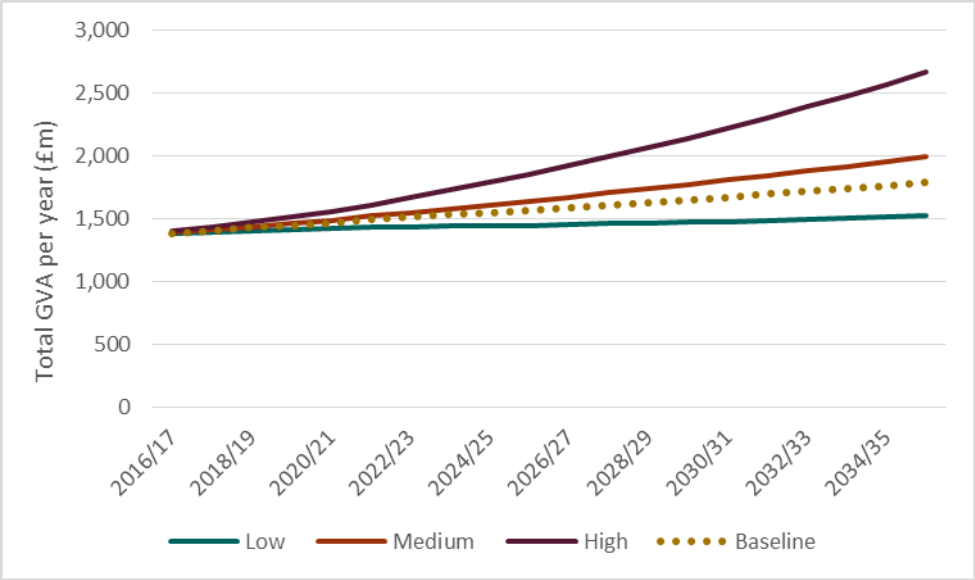


Figure 10 shows how the total GVA of all sectors under each scenario for the Prescriptive plan option, and the baseline, develops over the 20 years. This shows that even under the low scenario, the sectors will still experience net growth from year 0.

Figure 12: Economic Outcome of Prescriptive Plan Option: Total GVA per Year



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Annex 1

This annex provides additional information to support the main report section on the methodology for assessing the economic impact using stakeholder interviews (Section 3.3.2).

Table 12: Results of Policy Scoping Exercise

Policy Code	Policy Name	Directly Relevant Sector(s), if any	General Policy (Y/N)
AGG	Aggregates	Aggregates	No
AQ	Aquaculture	Aquaculture, Fisheries	No
BIO	Biodiversity	Marine Recreation	Yes
CAB	Cabling	Telecoms & Communications, Renewables	No
CC	Climate change	Coastal Protection, Oil and Gas	Yes
CCS	Carbon capture and storage	Carbon Capture & Storage	No
CHA	Seascape		Yes
CO	Co-location and mitigation of conflicts		Yes
DD	Dredging and disposal	Dredging	No
DEF	Defence	Military Defence	No
DIST	Disturbance		Yes
ECO	Ecology and Ecosystem Services		Yes
EMP	Support for regeneration and diversification of activities that improve socioeconomic conditions		Yes
FISH	Fisheries	Fisheries	No
GES	Good Environmental Status and Good Ecological Status		Yes
GOV	Displacement		Yes
HER	Heritage		Yes
INF	Infrastructure	Coastal Protection	Yes
MPA	Marine protected areas		Yes
PS	Ports and shipping	Ports, Shipping	No
TIDE	Tidal stream and wave	Renewables	No
TR	Tourism and recreation	Coastal Tourism, Marine Recreation	No
WIND	Offshore wind renewable energy	Renewables	No
WQ	Water quality		Yes
Note: Policies that are categorised as General (see General Policy heading) can also be directly relevant to specific sectors (see 'Biodiversity') as they explicitly refer to them in the policy text.			

The following stakeholders were interviewed in order to determine the economic impact of the south marine plan options:

- Associated British Ports
- British Marine Aggregates Producers Association
- British Marine Federation
- British Ports
- Chamber of Shipping
- The Crown Estate
- The Department of Energy and Climate Change
- EDF Energy
- Environment Agency
- Focus Offshore
- Hanson Aggregates Marine Ltd
- Maritime and Coastguard Agency
- National Federation of Fishermen's Organisations
- Poole Harbour Commissioners
- Portland Harbour Authority
- Royal Yachting Association
- Southern Inshore Fisheries and Conservation Authorities
- Subsea Cables UK

Annex 2

Annex 2 provides the data and assumptions used to calculate the savings associated with marine licence applications in the south marine plan areas.
The number of applications per year is based on data provided by MMO, covering all marine licence applications submitted in the south marine plan areas from 2011/12 through 2014/15. The numbers of applications per year have been averaged to provide the totals shown in Table 13. The cost per licence was taken from a previous report (MMO, 2013b).
Percentage savings assumptions are shown in Table 15.

Table 13: Assumptions and Data used to Calculate Marine Licencing Savings

Fee Band	Average Number of Applications per Year	Cost per licence (2009 prices)	Cost per licence (2015 prices)
Band 0	3	£2,699	£3,033
Band 1	43	£2,699	£3,033
Band 2	36	£16,000	£17,981
Band 3	38	£73,503[1]	£82,605
Unknown	1	£2,699	£3,033
Total	120	N/A	N/A

Notes:
1. Includes EIA costs.

Table 14: Cost Saving Assumptions for Marine Licence Applications, per Plan Option, per Scenario

Plan Option	Low Scenario	Medium Scenario	High Scenario
Flexible (1)	0%	2%	3%
Balanced (2)	0%	0%	0%
Prescriptive (3)	0%	2%	3%

Annex 3

Annex 3 provides the baseline growth rates used in the calculation of the 20 year baseline for each of the 14 sectors.

Table 15: Baseline Projected Sectorial Growth Rates for GVA, Number of Businesses and Direct Employment

Industry	Economic Indicator	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 20
		2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2035/36
Aggregates	Gross Value Added	2.0%	4.6%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
	Number of Businesses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Employment	3.7%	4.6%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Aquaculture	Gross Value Added	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Number of Businesses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Employment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Coastal Protection	Gross Value Added	3.7%	4.6%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
	Number of Businesses	3.7%	4.6%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
	Employment	3.7%	4.6%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Coastal Tourism	Gross Value Added	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Number of Businesses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Employment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Military Defence	Gross Value Added	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Number of Businesses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Employment	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dredging	Gross Value Added	0.7%	1.5%	1.5%	1.5%	1.5%	1.5%	2.0%	2.0%	2.0%
	Number of Businesses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Employment	0.7%	1.5%	1.5%	1.5%	1.5%	1.5%	2.0%	2.0%	2.0%
Fisheries	Gross Value Added	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Number of	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Industry	Economic Indicator	Year 0 2015/16	Year 1 2016/17	Year 2 2017/18	Year 3 2018/19	Year 4 2019/20	Year 5 2020/21	Year 6 2021/22	Year 7 2022/23	Year 20 2035/36
	Businesses									
	Employment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Marine Recreation	Gross Value Added	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Number of Businesses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Employment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Oil & Gas	Gross Value Added	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Number of Businesses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Employment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ports	Gross Value Added	0.7%	0.7%	1.5%	1.5%	1.5%	1.5%	1.5%	2.0%	2.0%
	Number of Businesses	0.7%	0.7%	1.5%	1.5%	1.5%	1.5%	1.5%	2.0%	2.0%
	Employment	0.7%	0.7%	1.5%	1.5%	1.5%	1.5%	1.5%	2.0%	2.0%
Renewables	Gross Value Added	N/A	23%	71%	46%	17%	22%	25%	-4%	0%
	Number of Businesses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Employment	N/A	114%	67%	1%	-27%	0.0%	0.0%	-45%	0.0%
Shipping	Gross Value Added	0.7%	0.7%	1.5%	1.5%	1.5%	1.5%	1.5%	2.0%	2.0%
	Number of Businesses	0.7%	0.7%	1.5%	1.5%	1.5%	1.5%	1.5%	2.0%	2.0%
	Employment	0.7%	0.7%	1.5%	1.5%	1.5%	1.5%	1.5%	2.0%	2.0%
Telecoms	Gross Value Added	1.8%	2.3%	2.7%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
	Number of Businesses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Employment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Annex 4

Annex 4 provides three tables of assumed growth rates for each sector resulting from the implementation of the three marine plan options. Figures provided include a low, medium and a high scenario. A single figure has been used to represent all types of impacts (outlined in Section 3.3) due to the difficulty in establishing the exact nature of impacts likely to occur.

Table 16: Growth Rate Assumptions for the Balanced Policy Option

Industry	Level of Impact	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Y
		2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2
Aggregates	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	1
Aquaculture	Low	0.0%	0.0%	0.0%	-1.0%	-1.0%	-1.0%	-1
	Medium	1.0%	1.0%	1.0%	2.0%	2.0%	2.0%	2
	High	1.0%	1.0%	1.0%	3.0%	3.0%	3.0%	3
Coastal Protection	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	1.0%	1.0%	1.0%	2.0%	2.0%	2.0%	2
Coastal Tourism	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.5%	0.5%	0.5%	1.0%	1.0%	1.0%	1
	High	1%	1%	1%	2.0%	2.0%	2.0%	2
Defence	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Dredging	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Fisheries	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	1.0%	1.0%	1.0%	2.0%	2.0%	2.0%	2
	High	1.0%	1.0%	1.0%	2.5%	2.5%	2.5%	2
Marine Recreation	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	1.0%	1.0%	1.0%	2.0%	2.0%	2.0%	2
	High	1.0%	1.0%	1.0%	2.5%	2.5%	2.5%	2
Oil & Gas	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Ports	Low	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-2
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	1.0%	1.0%	1.0%	2.5%	2.5%	2.5%	2
Renewables	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Shipping	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	1.0%	1.0%	1.0%	2.5%	2.5%	2.5%	2
Telecoms	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0

Table 17: Growth Rate Assumptions for the Flexible Policy Option

Industry	Level of Impact	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Y
		2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2
Aggregates	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	1
Aquaculture	Low	0.0%	0.0%	0.0%	-1.0%	-1.0%	-1.0%	-1
	Medium	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	1
	High	1.0%	1.0%	1.0%	2.0%	2.0%	2.0%	2
Coastal Protection	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	1.0%	1.0%	1.0%	2.0%	2.0%	2.0%	2
Coastal Tourism	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1
Defence	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Dredging	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Fisheries	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	1
	High	1.0%	1.0%	1.0%	3.0%	3.0%	3.0%	3
Marine Recreation	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1
Oil & Gas	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Ports	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-1
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	2
Renewables	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Shipping	Low	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-2
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	2
Telecoms	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0

Table 18: Growth Rate Assumptions for the Prescriptive Policy Option

Industry	Level of Impact	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Y
		2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2
Aggregates	Low	-1.0%	-1.0%	-1.0%	-2.0%	-2.0%	-2.0%	-2
	Medium	0.0%	0.0%	0.0%	1.0%	1.0%	1.0%	1
	High	1.0%	1.0%	1.0%	2.0%	2.0%	2.0%	2
Aquaculture	Low	-1.0%	-1.0%	-1.0%	-2.0%	-2.0%	-2.0%	-2
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	2.0%	2.0%	2.0%	4.0%	4.0%	4.0%	4
Coastal Protection	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Coastal Tourism	Low	-1.0%	-1.0%	-1.0%	-2.0%	-2.0%	-2.0%	-2
	Medium	0.5%	0.5%	0.5%	1.0%	1.0%	1.0%	1
	High	1.0%	1.0%	1.0%	3.0%	3.0%	35.0%	3
Defence	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Dredging	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Fisheries	Low	-1.0%	-1.0%	-1.0%	-2.0%	-2.0%	-2.0%	-2
	Medium	1.0%	1.0%	1.0%	3.0%	3.0%	3.0%	3
	High	1.0%	1.0%	1.0%	3.0%	3.0%	35.0%	3
Marine Recreation	Low	-1.0%	-1.0%	-1.0%	-2.0%	-2.0%	-2.0%	-2
	Medium	1.0%	1.0%	1.0%	2.0%	2.0%	2.0%	2
	High	1.0%	1.0%	1.0%	3.0%	3.0%	35.0%	3
Oil & Gas	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Ports	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	1.0%	1.0%	1.0%	3.0%	3.0%	35.0%	3
Renewables	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
Shipping	Low	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-2
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	1.0%	1.0%	1.0%	3.0%	3.0%	35.0%	3
Telecoms	Low	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Medium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	High	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0