

Annex H11 Approach for assessing impacts on oil and gas related activities

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H11.1 This annex outlines the method taken to assess the impacts of recommended Marine Conservation Zones (rMCZs) on oil and gas exploration and production, gas interconnectors and gas storage activities (hereafter referred to as oil and gas activity) and carbon capture and storage (CCS)¹ activities. The method is presented under the following sections: (1) baseline description; (2) management scenarios; (3) assessment of the impacts; and (4) limitations. One management scenario has been developed for this sector.

1 Baseline description

H11.2 The baseline describes only those aspects of oil and gas activity that could be impacted on by the designation of Marine Conservation Zones (MCZs). The Impact Assessment (IA) assumes that only the cost of future licence applications for oil and gas activity could be impacted on by MCZ designation. Currently consented developments of oil and gas production are assumed not to be impacted on by MCZs, and so are not described in the baseline. Therefore, the baseline only describes the anticipated number of future oil and gas (including CCS) licence applications over the 20 year period of the IA.

H11.3 It is not possible to provide a site-specific baseline description of future oil and gas licence applications (including CCS). This is because it is not yet known what development proposals will come forward and where these will be located. However, due to the distribution of rMCZs, future development proposals in the MCZ project area will always have to consider their impact upon rMCZs irrespective of where they are located. This is because rMCZs will always be the nearest environmentally designated area to oil and gas development proposals². A baseline description is therefore provided for each regional project area (see Annex F) and for the entire suite of sites (see Evidence Base) and not for each rMCZ.

2 Management scenario

H11.4 The impact of oil and gas (including CCS) activity upon MCZ features will be managed under the existing marine licensing framework. The assumptions included here have been developed in collaboration with Oil and Gas UK³ and the Carbon Capture and Storage Association (CCSA).⁴ Brindex, Oil and Gas Independent's Association (OGIS) and Gas Storage Operators' Group (GSOG) were also contacted but did not provide any information to inform the IA.

H11.5 One management scenario is employed in the analysis for this sector. This is based on the advice of the Department of Energy and Climate Change (DECC) (DECC, pers. comm., 2012) and the Joint Nature Conservation Committee (JNCC) and Natural England (JNCC and Natural England, 2011a) and costs provided by Oil and Gas UK and CCSA (pers. comms., 2011). This scenario is used to estimate the most realistic additional costs to the oil and gas sector (including CCS) arising from MCZs. This scenario is considered to be the best estimate of impact upon the sector.

H11.6 Oil and Gas UK and CCSA feel that the majority of their concerns are presented in the management scenario. However, they wished to present their own concerns in the IA about the possible impact of MCZs upon future licensing decisions. This is because future licensing

¹ Including transportation of carbon dioxide as well as storage (CCSA, pers. comm., 2011)

² Oil and gas licence applications are required to assess their impact of the nearest environmentally designated area.

³ Oil & Gas UK is a trade association representing the interests of the UK offshore oil and gas industry.

⁴ CCSA is a trade association representing the interests of CCS industries based in the UK.

decisions will be site-specific, whereas the assumptions made for the purpose of the IA are not (because it is not yet known where future developments will be or what they will comprise). As such Oil and Gas UK and CCSA have provided assumptions and estimates of costs that are presented in addition to the management scenario. This is provided in Section 2.5 of this document, in Annex J1b and in the Evidence Base.

H11.7 The management scenario is considered to be the best estimate of impact, as it is based on the advice of DECC, Natural England and JNCC. These costs are included in the headline figures of the IA. The further assumptions and estimates of costs provided by industry have not been included in the IA Summary but are summarised in the Evidence Base accompanying the IA. This is because while these costs are important to consider as they represent industry's concerns, they are not the best estimate of impact as they allow for unlikely eventualities (DECC, pers. comm., 2012).

H11.8 The management scenario does not pre-judge any future site-specific licensing decisions. Following MCZ designation, the management of activities in MCZs will be decided upon on a site-by-site basis and may differ from the IA assumptions.

2.1 Assumptions about the assessment of environmental impact

H11.9 For the purposes of the IA, it is assumed that as a result of MCZs, operators will incur additional costs in the assessment of environmental impacts completed in support of licence applications (JNCC and Natural England, 2011b). These costs are likely to comprise additional time to consider and report impacts of proposals on achieving the conservation objectives of features protected by MCZs (Natural England and JNCC, 2011a).

H11.10 MCZ habitats and species of conservation importance are on the Oslo and Paris Convention (OSPAR) List (of Threatened and/or Declining Species and Habitats) and on the UK List of Priority Species and Habitats (UK Biodiversity Action Plan (BAP)). Impacts upon these features are already assessed and mitigated against by the oil and gas sector in the absence of MCZ designations⁵. Therefore, there will not be additional costs to operators in undertaking assessments of impacts on habitats and species of conservation importance as a result of MCZs (JNCC and Natural England, 2011b).

H11.11 However, additional costs will be incurred in assessing the impacts of future oil and gas and CCS developments upon MCZ broad-scale habitats. This is because although impacts on habitats are currently assessed in the absence of MCZs, they are not specifically assessed for the broad-scale habitats protected by MCZs (JNCC and Natural England, 2011b). Following MCZ designation, the operator will need to take some additional time to identify whether those habitats are broad-scale habitats that are protected by an MCZ. As described in Natural England and JNCC (2011a), the additional requirements of the environmental assessment are likely to comprise:

- additional time to obtain information on the MCZ, its boundary, the features it protects and their conservation objectives;

⁵ It is assumed that future CCS proposals would be required to do the same, regardless of whether MCZs are designated or not.

- additional time to consider the impacts of its proposal on the MCZ broad-scale habitat features as set out in assessment of environmental impact guidelines.

H11.12 In the event that the impact of a development on the ecological coherence of the Marine Protected Area (MPA) network (of which MCZs will be a component) needs to be assessed, it is assumed for the purposes of the IA that this assessment would be undertaken by Natural England or JNCC (Natural England and JNCC, 2011a).

H11.13 Various assessments of environmental impact for oil and gas developments are already undertaken in the absence of MCZs. These are provided in a number of permit applications and environmental statements across various phases of development, as set out in Table 1. Estimates of additional costs that are likely to arise as a result of MCZs for assessing environmental impacts for oil and gas developments have been provided by Oil and Gas UK and are presented in Table 1. Oil and Gas UK has indicated that these costs are representative of one typical oil and gas development application.

H11.14 CCSA anticipates that a similar consenting process (to that set out in Table 1) and therefore similar costs will apply to the storage of CO₂. CCSA has added phase eight and the associated cost for a key difference. However, as CCS is a three-part process – capture of CO₂ at the power station, then transportation (onshore and offshore) and then storage (injection) – the consenting process may vary for the capture and the transportation.

Table 1: The anticipated additional requirements and costs for the assessment of environmental impact in future licence applications for the oil and gas (and CCS) sector arising as a result of MCZs

Time period (number of years) over which each development phase occurs, in consecutive order	List of permits and applications that already take place in each development phase, for which it is assumed that an assessment of environmental impact is undertaken (which will need to include an assessment of impact upon MCZ features)	Estimated additional resource inputs and cost arising as a result of MCZ designation (e.g. £/day) for the entire phase*	Estimated additional cost (£m) for the entire phase as a result of MCZ designation (one-off cost per application)
0.5 years Surveys and evaluation (phase one)	Up to 15 permits including consent to survey (Petroleum Operations Notice (PON) 14A)	£1,000 consultancy fees (2 days at £500/day) £1,000 additional input of staff time by the operator (2 days at £500/day)	0.002
0.25 years Drilling and exploration (phase two)	<ul style="list-style-type: none"> • PON15b for drilling – this is both a chemical permit and determination of whether an Environmental Statement is required • Environmental Statement (if required) • Oil Pollution Emergency Plan (OPEP) for drilling and well test • Chemical permit for drilling and well test • Consent to locate rig • The Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 (OPPC) permit for 	£2,000 consultancy fees (4 days at £500/day) £2,000 additional input of staff time by the operator (4 days at £500/day)	0.004

Time period (number of years) over which each development phase occurs, in consecutive order	List of permits and applications that already take place in each development phase, for which it is assumed that an assessment of environmental impact is undertaken (which will need to include an assessment of impact upon MCZ features)	Estimated additional resource inputs and cost arising as a result of MCZ designation (e.g. £/day) for the entire phase*	Estimated additional cost (£m) for the entire phase as a result of MCZ designation (one-off cost per application)
	drilling and well test		
0.25 years Drilling and appraisal (phase three)	<ul style="list-style-type: none"> • PON15b for drilling – this is both a chemical permit and determination of whether an Environmental Statement is required • Environmental Statement (if required) • OPEP for drilling and well test • Chemical permit for drilling and well test • Consent to locate rig • OPPC permit for drilling and well test 	<p>£2,000 consultancy fees (4 days at £500/day)</p> <p>£2,000 additional input of staff time by the operator (4 days at £500/day)</p>	0.004
0.25 years Development (phase four)	<ul style="list-style-type: none"> • PON15c for pipelines – this is both a chemical permit and determination of whether an Environmental Statement is required • Environmental Statement (if required) • OPPC permit • Chemical permit • Registration • Pipeline Works Authorisation • Consent to locate • Consent to deposit materials 	<p>£2,000 consultancy fees (4 days at £500/day)</p> <p>£2,000 additional input of staff time by the operator (4 days at £500/day)</p>	0.004
19 years Operation and production (phase five)	<ul style="list-style-type: none"> • PON15d for production operations – this is both a chemical permit and determination of whether an Environmental Statement is required • Environmental Statement (if required) • Emissions trading permit • Chemical permit • Radioactive sources permit • OPEP • Consent to flare • Consent to vent • OPPC permit • Waste management plan • UK Oil Payment Programme certificate 	<p>£500/permit/yr. Assuming 20 permit applications are submitted in the 20 year period of the IA, the additional cost comprises: £10,000 consultancy fees £10,000 additional input of staff time by the operator</p>	0.02
20 years + Maintenance (phase six)	<ul style="list-style-type: none"> • PON15f for well interventions – this is both a chemical permit and determination of whether an Environmental Statement is required 	<p>£1,000 consultancy fees (2 days at £500/day)</p> <p>£1,000 additional input of</p>	0.002

Time period (number of years) over which each development phase occurs, in consecutive order	List of permits and applications that already take place in each development phase, for which it is assumed that an assessment of environmental impact is undertaken (which will need to include an assessment of impact upon MCZ features)	Estimated additional resource inputs and cost arising as a result of MCZ designation (e.g. £/day) for the entire phase*	Estimated additional cost (£m) for the entire phase as a result of MCZ designation (one-off cost per application)
	<ul style="list-style-type: none"> Environmental Statement (if required) Pipeline Works Authorisation Consent to locate Chemical permit 	staff time by the operator (2 days at £500/day)	
20 years + Decommissioning (phase seven)	<ul style="list-style-type: none"> PON15e for decommissioning – this is both a chemical permit and determination of whether an Environmental Statement is required Environmental Statement (if required) Baseline environmental survey Maritime and Coastguard Agency licence (covering decommissioning activities, e.g. removal/deposit and/or disposal of infrastructure from the seabed) Consent to locate Evaluate with regulator Decommissioning programme OPPC permit Chemical permit 	£1,000 consultancy fees (2 days at £500/day) £1,000 additional input of staff time by the operator (2 days at £500/day)	0.002
20 years + Post-closure monitoring (CCS only) (phase eight)	Not yet known	£1,000 consultancy fees (2 days at £500/day) £1,000 additional input of staff time by the operator (2 days at £500/day)	0.002

* Data for phases one to seven supplied by Oil and Gas UK; data for phase eight supplied by CCSA.

Source: Oil and Gas UK pers. comm., August and September 2011; CCSA, pers. comm., August and September 2011.

H11.15 As there are currently no CCS proposals or developments in the four regional MCZ project areas, CCSA has advised that the offshore storage component of CCS developments is likely to follow the same development phases as the oil and gas industry (as set out in Table 1) in addition to a final phase of 'post-closure' monitoring before the storage site is handed over to the Government. Based on advice provided by CCSA, it is assumed that the additional costs of assessment of environmental impacts will be incurred to all future CCS development applications (and not just those that will be consented). It is anticipated that CCS development applications will follow a similar consenting process as for the oil and gas industry (CCSA, pers. comm., 2011).

2.2 Assumptions about mitigation of impact on rMCZ features

H11.16 In rMCZs that are not rMCZ Reference Areas, for the purposes of the IA it is assumed that no additional mitigation of impacts upon MCZ features will be required for oil and gas and CCS activity, compared with the mitigation of impacts required in the absence of the MCZ (JNCC and Natural England, 2011b). This is for the following reasons:

- Impacts on MCZ habitats and species that are on the OSPAR List (of Threatened and/or Declining Species and Habitats) and on the UK List of Priority Species and Habitats (UK BAP) are already mitigated for outside of MCZs.
- For broad-scale habitats, the footprint of oil and gas and CCS developments and their pipelines and cables is unlikely to significantly impact on the overall condition of the broad-scale habitat.

These assumptions do not pre-judge the outcome of licensing decisions.

H11.17 In rMCZs that are rMCZ Reference Areas, the IA assumes that the installation and operation of oil and gas infrastructure will be prohibited. This is because these activities are depositional and/or extractive, neither of which is permitted in an MCZ Reference Area (JNCC and Natural England, 2010). There are currently no existing or planned oil and gas developments within any rMCZ Reference Areas. Neither do any rMCZ Reference Areas overlap with blocks in the 26th Round of Offshore Licensing that have 'significant discoveries' or 'fallow blocks and discoveries' (see paragraph H10.21 for an explanation of these terms). DECC (pers. comm., 2012) has advised that it is unlikely that any future oil and gas (including CCS) activity would take place in any of the rMCZ Reference Areas based on where the rMCZ Reference Areas are located in relation to existing oil and gas fields and infrastructure. Because it is not anticipated that rMCZ Reference Areas will impact on oil and gas or CCS activities, this has not been assessed.

2.3 Assumptions regarding future oil and gas developments

H11.18 For the purposes of the IA, it is assumed that all future oil and gas licence applications will need to consider the potential impact upon MCZ features in their assessment of environmental impact (JNCC and Natural England, 2011b). This will incur an additional cost to operators as described above. It is assumed for the purposes of the IA that over the 20 years covered by the IA, one application will be made for a proposal in each UK Continental Shelf (UKCS) block that was licensed in the 26th Round and is within the MCZ project area (DECC, pers. comm., 2011). This assumption is based on a qualitative assessment of trends provided by DECC.

H11.19 For future licence applications for 26th Round blocks that have been offered to an operator for oil and gas extraction, it is assumed that the additional costs for assessment of environmental impact are incurred in 2013 (DECC, pers. comm., 2012). For all remaining blocks in the 26th Round, in the absence of information as to when these costs will be incurred it is assumed that they will be incurred in year 10 (2022) of the 20-year period of the IA (DECC, pers. comm., 2012; Oil and Gas UK, pers. comm., 2011).

H11.20 The IA does not include any additional costs that may be incurred for assessment of environmental impact for projects for which consent is currently being sought (as listed on the DECC website⁶ on 25 August 2011). This is because these costs will be incurred before the start of the period covered by the IA (2013). With regard to future applications in the MCZ project area, it is assumed that the additional costs of assessing environmental impacts will be different for developments in blocks in the 26th Round with known discoveries compared with those blocks in the 26th Round with no known discoveries (Oil and Gas UK, pers. comm., 2011). This is because

⁶ Development proposals currently going through the consenting process are listed at: www.og.decc.gov.uk/environment/permits/eis/eisr004.htm and www.og.decc.gov.uk/ppath/currentprojects.pdf [accessed 25 August 2011].

the additional cost to the operator for the assessment of environmental impacts depends on whether a partial or full development of a field is anticipated during the 20-year period of the IA. The assumptions made for each of these types of development are described below.

H11.21 Blocks in the 26th Round with known discoveries are defined in the IA as those blocks with 'significant discoveries' and 'fallow blocks and discoveries' (as listed on the DECC website).⁷ Significant discoveries are those that have been identified by DECC as being significant in terms of flow rate. They are discoveries that either have a Field Development Plan approved or are in production. The list of blocks with significant discoveries used in the IA was last updated on 1 June 2010 (accessed from the DECC website on 8 September 2011). Fallow blocks are defined in the IA as blocks in the 26th Round where an operator has been granted a licence for further exploration following a discovery, but after three years has been unable to progress activity due to commercial barriers. Fallow blocks are either relinquished if there are no agreed plans for significant activity after a certain period of time or re-licensed if commercial conditions improve. The list of fallow blocks used in this IA was last updated on 25 February 2011 (accessed from the DECC website on 8 September 2011). The remainder of UKCS blocks licensed in the 26th Round (including those that are subject to Appropriate Assessment) that lie within the MCZ project area are blocks with no known discoveries.

H11.22 For developments in blocks in the 26th Round that **have** significant discoveries, are fallow blocks or fallow discoveries, the additional costs of assessing environmental impacts for licence applications is estimated as follows.

H11.23 It is assumed that oil and gas developments in these blocks have already completed phase one in Table 1 and so no additional costs are incurred for this phase as a result of MCZs. It is assumed that the exploration and appraisal phases for these developments will be completed and additional costs as a result of MCZs (as shown for phases two and three in Table 1) will be incurred within the 20 year period of the analysis. It is assumed that 50% of these applications will go on to reach full development, operation and maintenance phases and incur additional costs as a result of MCZs (as shown for phases four, five and six in Table 1). Production could begin within the IA 20-year period of analysis but may not finish (DECC, Defra and Natural England, 2011). These assumptions provide best-guess estimates and are based on the advice of DECC (DECC, pers. comm., 2011). The costs arise only for blocks within the MCZ project area.

H11.24 For developments in blocks in the 26th Round within the regional MCZ project areas that **do not have** significant discoveries, fallow blocks or fallow discoveries; the additional costs of assessing environmental impact are estimated as follows.

H11.25 It is assumed that only surveys, evaluation, appraisal and exploratory drilling (phases one, two and three in Table 1) will be completed within the IA 20 year period of analysis. Additional costs for assessing environmental impacts are incurred as a result of MCZs only for these phases. It is assumed that no further licence applications will be developed for these blocks within the IA

⁷ As listed on http://og.decc.gov.uk/en/olgs/cms/data_maps/offshore_maps/offshore_maps.aspx [accessed 8 September 2011]. Discoveries listed under 'Other shapefiles', '2. Hydrocarbon Fields' were also reviewed but were not included under the definition of discoveries here as their status was listed as either producing, production ceased, production suspended or under development. Links and definition were provided by DECC by email on 7 September 2011.

20-year period of analysis (DECC, Defra and Natural England, 2011). The costs arise only for developments in blocks within the MCZ project area.

H11.26 It is assumed for the purposes of the IA that 50% of the 175 oil and gas fields that are currently in production within the MCZ project area will start the decommissioning process within the 20 year period of the IA (a total of 88) (Oil and Gas UK, pers. comm., 2011; DECC, pers. comm., 2011). It is assumed that an assessment of environmental impact will be carried out in support of quarter of the licence applications for anticipated decommissions in the years 2017, 2022, 2027 and 2032. Consequently the additional costs of assessment of environmental impact for decommissioning are assumed to be incurred to industry in each of these years (Oil and Gas UK, pers. comm., 2011; DECC, pers. comm., 2011).

H11.27 Table 2 summarises the anticipated additional costs for licence applications for each type of future oil and gas and CCS development considered in the IA. This employs the estimates provided by Oil and Gas UK and CCSA that are presented in Table 1. The anticipated increase in costs has been estimated relative to (and therefore net of) the existing assessment of environmental impacts of proposals that would be provided in the absence of MCZs. Oil and Gas UK and CCSA have indicated that these are realistic estimates of the additional costs of assessing environmental impacts in development applications as a result of MCZs. Annex N10 provides more detail of how these costs have been used in the final calculations.

Table 2: Summary of the anticipated additional costs in the assessment of environmental impact for future applications for each type of future oil and gas and CCS development

Additional cost to the operator for future licence applications for each type of oil and gas and CCS development. These costs arise as a result of MCZs	Estimated total additional cost (£m) to the operator for each future development that arises as a result of MCZs (total one-off cost per application)
Additional cost of future licence applications for CCS developments. As no CCS developments have yet taken place or are proposed in the MCZ project area, it is assumed that all eight phases as set out in Table 1 will be completed in each development application.	Sum of costs in Table 1 for phases one to seven (excluding phase eight as it will occur outside the 20-year period of the IA): 0.038
Additional cost of future licence applications for oil and gas developments in blocks licensed in the 26th Round that have significant discoveries or are fallow blocks or have discoveries that will not go on to full development. It is assumed that 50% of these developments will complete only phases two and three within the 20 year period of the IA.	Sum of costs in Table 1 for phases two and three only: 0.008
Additional cost of future licence applications for oil and gas developments in blocks licensed in the 26th Round that have significant discoveries, are fallow blocks or have discoveries that will go on to full development. It is assumed that 50% of these developments will complete phases two, three, four and five within the 20 year period of the IA.	Sum of costs in Table 1 for phases two, three, four and five only: 0.032
Additional cost of future licence applications for oil and gas developments in blocks licensed in the 26th Round that do not have significant discoveries or are fallow blocks or have discoveries. It is assumed that these developments will complete phases one to three only within the 20 year period of the IA.	Sum of costs in Table 1 for phases one, two and three only: 0.010
Additional cost of licence applications for decommissioning, assuming that 50% of fields currently in production will commence decommissioning within the 20 year period of the IA.	Sum of costs in Table 1 for phase seven only: 0.002

Source: Oil and Gas UK pers. comm., August and September 2011; CCSA, pers. comm., August and September 2011

Assumptions made to provide low, best and high cost estimates for the IA

H11.28 Different estimates of the number of future licence applications over the IA period are employed to estimate low, best (or midpoint) and high cost estimates for the IA. This reflects uncertainty in the number of future licence applications that could come forward in blocks with no known discoveries over the IA period and provides sensitivity analysis. Previously unknown resources could be discovered and prove to be commercially viable over the IA period, as technology improves and oil and gas prices increase.

H11.29 For the best (midpoint) estimate, the number of future oil and gas licence applications over the 20 year period of the IA is assumed to be one per licensed block in the 26th Round in the calculations. Due to a lack of information about when the additional costs for this might arise, it is assumed that they will be incurred in 2022 (year ten of the 20 year period of the IA).

H11.30 Based on advice provided by DECC (pers. comm., 2012), the low cost estimate is calculated using an estimate of the total number of future licence applications in blocks in the 26th Round with a 'significant discovery' or 'fallow block with discovery' that is 25% lower than that used for the best estimate. For the remaining blocks, the total number of future licence applications is assumed to be 50% less than the number used to calculate the best estimate.

H11.31 Conversely, the high cost estimate is calculated using an estimate of the total number of future licence applications in blocks in the 26th Round with a 'significant discovery' or 'fallow block with discovery' that is 25% higher than that used for the best estimate. For the remaining blocks, the total number of future licence applications is assumed to be 50% than the number used to calculate with the best estimate.

27th Seaward Licensing Round

H11.32 In February 2012, DECC announced a new round of licensing for oil and gas blocks on the UKCS. Because this was towards the end of the time when this analysis was carried out, only the costs of the entire suite of rMCZs were updated (not the estimates of costs for the four regional suites of rMcZs). Based on the advice of DECC (pers. comm., 2012), the assessment was updated to include blocks licensed in the 27th Round that were new acreage compared with the blocks licensed in the 26th Round. There were 123 such new blocks licensed in the 27th Round.

H11.33 Of these, 38 blocks overlap with 32 rMCZs that are rMCZ Reference Areas. Future oil and gas proposals could in theory arise in blocks that overlap with rMCZ Reference Areas. If these proposals could not proceed because of the rMCZ Reference Area this could result in significant costs to the sector. However, it is unlikely (although possible) that rMCZ Reference Areas would impact on future oil and gas exploration, extraction or production within the 20 year period of the IA based on where the sites are located (DECC, pers. comm. 2011).

H11.34 As investigations of these blocks is preliminary, it is assumed that any oil and gas developments in these blocks will complete surveys and evaluation, appraisal and exploratory drilling only (phases one, two and three in Table 1) within the 20-year period of the IA (DECC, pers. comm. 2011). As such, they are assumed to incur additional costs as a result of MCZs associated with these phases only (£10,000 per application) in the midpoint year of the IA period (2022). It is assumed that no further licence applications will be developed for these blocks within the 20 year period of the IA (DECC, pers. comm. 2011).

2.4 Assumptions made concerning future CCS developments

H11.35 For the purposes of the IA, it is assumed that 20 CCS applications will be submitted over the 20-year period of the IA. This could comprise licence applications for storage and/or transportation of CO₂. This is based on a CCSA study which estimates that the UK will need capacity of 20 to 30GW of CCS (alongside other technologies) to decarbonise the electricity sector by 2030 (CCSA, pers. comm., 2011). This would require storage of 100Mt CO₂/yr and a total of 500Mt by 2030. It is generally assumed that one storage facility could store 2.5 to 5Mt CO₂/yr for an average of 10 to 20 years. In order to achieve storage of 500Mt by 2030 or 100Mt/yr, it is assumed that five to 20 storage developments will be required. It is assumed that five applications will be submitted in each of the years 2016, 2020, 2024 and 2028 and that the additional costs of environmental assessments for these applications will also be incurred to industry in these years (CCSA, pers. comm., 2011).

H11.36 There is considerable uncertainty regarding the number of CCS applications that are likely to be submitted over the IA 20-year period of analysis. This is because UK policy concerning the sector is yet to be defined and demonstration projects and investment programmes are yet to be determined.⁸ The government anticipates roll-out of commercial ventures in 2020 to 2025 following the delivery of four demonstration projects (DECC, 2010). However, the first demonstration project proposed at Longannet Power Station will not be proceeding.⁹ The assumption that 20 CCS applications are likely to come forward over the 20-year period of the IA is likely to be an overestimate as it is based on what is required, not the number of proposals that is likely to be viable. Also, the applications for all proposals will not necessarily need to consider impacts on MCZ features. The commercial developments that do take place are more likely to occur in the latter half of the IA period of analysis for the IA (DECC, 2010).

H11.37 CCSA has indicated that the estimate used for the number of applications is within the range of estimates made by both DECC and the Committee on Climate Change, albeit at the higher end of their estimates (CCSA, pers. comm., 2011). CCSA indicates that the estimate does not include a further 20 to 40 CCS developments that it is anticipated will be required after 2030. Consent is likely to be sought for some of these before the end of the IA 20-year period of analysis.

H11.38 Within the MCZ project area, most of the CCS developments are anticipated to take place in the Net Gain Project Area and in the east of the Irish Sea Conservation Zones Project Area (CCSA, pers. comm., 2011). In addition, CCSA anticipates that a large number of licence applications for offshore CO₂ transport (pipelines and port facilities) will be submitted over the IA 20-year period of analysis. It is not possible to estimate the exact number of these licence applications at this time and, consequently, impacts on these are not estimated here (CCSA, pers. comm., 2011).

2.5 Additional concerns of Oil and Gas UK and CCSA

H11.39 Oil and Gas UK and CCSA have concerns that rMCZs could have additional impacts on oil and gas and CCS developments (other than those outlined by the management scenario).

⁸ On 12 March 2012, the Energy Secretary launched DECC's competition for the development of CCS innovation technologies. Up to £20m is available as part of the wider £125m cross-government CCS research and development programme up to 2015. No details are available yet regarding the number of projects to be supported.

⁹ http://www.decc.gov.uk/en/content/cms/news/pn12_022/pn12_022.aspx [accessed 12 December 2011].

These concerns are included in Annex I (site-specific concerns), Annex J1b (general concerns) and the Evidence Base; but they are not included in the IA Summary. This is because DECC, Natural England and JNCC have indicated that the additional costs outlined by Oil and Gas UK and CCSA (see below) are unlikely to be incurred as a consequence of MCZs (DECC, pers. comm., 2012; JNCC and Natural England, 2011b).

H11.40 Oil and Gas UK and CCSA are content with the assumptions made in the management scenario about the additional costs of assessing environmental impacts, the definitions used for future licence applications and the assumptions regarding applications for future developments, with the following exceptions.

Assessment of environmental impact

H11.41 Oil and Gas UK and CCSA are concerned that additional costs could be incurred by operators, for the assessments of environmental impact that are completed in support of all future licence applications. These could comprise additional consultancy fees and developer time, additional modelling costs, and additional survey and ongoing data collection costs (Oil and Gas UK, pers. comm., 2011).

H11.42 Oil and Gas UK has stated that additional costs for the assessment of environmental impact (as a result rMCZs) have already been incurred for oil and gas licence applications submitted in 2011 and 2012. It has suggested that all of these licence applications (including decommissioning licences) have considered the potential impact of their proposal upon rMCZs features and their conservation objectives. These additional costs are estimated in Annex N10 by applying the estimates of costs for future licence applications to a list of current licence applications. Costs that arise prior to designation of the rMCZs in 2013 are not included in the IA Summary but are quantified in the Evidence Base.

Mitigation of impact upon rMCZ features

H11.43 Oil and Gas UK and CCSA are concerned that additional costs could be incurred by operators to mitigate the impact of their activities upon rMCZ features, as set out in Table 3. The mitigation suggested by Oil and Gas UK and CCSA includes re-routing of power cables and pipelines around MCZs (around only MCZ Reference Areas for the oil and gas sector and all MCZs for the CCS sector); horizontal drilling to resources underneath MCZs that are MCZ Reference Areas; uncertainties around mitigation of spills and leakages; and additional costs of ongoing monitoring of impact upon MCZ features as a licence condition. CCSA is concerned about the knock-on impacts that such mitigation, if it was required, would have on the economic viability of developments and on meeting the UK climate change targets.

H11.44 Quantitative estimates of costs have not been provided for all of the mitigation suggested by Oil and Gas UK and CCSA because it is not known where future developments will be located, what they will comprise and what the mitigation would involve, if it was required. These costs are described in order to communicate Oil and Gas UK and CCSA's concerns regarding the possible impact of MCZs upon future licensing decisions.

Table 3: The costs of additional mitigation of impacts on MCZ features that Oil and Gas UK and CCSA have suggested may be required

Time period (number of years) over which each development phase occurs, in consecutive order	Estimated additional resource inputs and cost due to MCZ designations (e.g. £/day) for the entire phase	Estimated unit cost (£m) for the entire phase
0.5 years Surveys and evaluation (phase one)	None	–
0.25 years Drilling and exploration (phase two)	None	–
0.25 years Drilling and appraisal (phase three)	None	–
0.25 years Development (phase four)	<p>Oil and gas: Re-routing of cables and pipelines around MCZs that are MCZ Reference Areas only. The cost is estimated based on the assumption that 3% of all anticipated future applications will require 10km of re-routing around each MCZ Reference Area.</p> <p>CCS: Re-routing of CCS cables and pipelines around MCZs, horizontal drilling to resources underneath MCZs that are MCZ Reference Areas, uncertainties around mitigation of spills and leakages, and additional costs regarding ongoing monitoring and survey of impact upon MCZ features as a condition of a marine licence. CCSA is concerned about the knock-on impacts that these would have on the economic viability of developments and meeting the UK climate change targets (CCSA, pers. comm., 2011). The impacts are not quantified due to lack of detail regarding future CCS projects at this time. The unit costs can be assumed to be the same as for oil and gas (DECC, pers. comm., 2012).</p>	<p>1.0/km re-routed (one-off cost)</p> <p>1.0/km re-routed (one-off cost)</p>
19 years Operation and production (phase five)	Ongoing additional monitoring and surveys of environmental impact as a condition of a licence (e.g. Barrow onshore gas terminals requiring long-term independent study to determine recovery rate of intertidal/sub-tidal marine habitat following pipeline construction)	Not costed
20 years + Maintenance (phase six)	Horizontal drilling into oil and gas resources under an MCZ Reference Area	Not costed
20 years + Decommissioning (phase seven)	None	–
20 years + Post-closure monitoring (CCS only) (phase eight)	None	–

Source: Oil and Gas UK, pers. comm., September 2011; CCSA, pers. comm. September 2011

4 Limitations

H11.45 There are a number of limitations associated with the approach adopted in the IA that derive from the assumptions made for the purposes of the IA. These include:

- In the absence of information about future oil and gas and CCS development proposals over the next 20 years, the IA assumptions may wrongly represent the actual number of licence

applications that come forward. More than one licence application may come forward for each block.

- In the absence of information about what licence decisions will actually be made over the next 20 years, the IA assumptions may wrongly represent the actual additional mitigation put in place in order to protect MCZ features.
- The estimated additional costs anticipated over the next 20 years are generic and may differ depending on the scale and nature of the development proposal and the site in question.

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