

<b>Title:</b> Medium Combustion Plant Directive and Chapter III of the Industrial Emissions Directive transposition Impact Assessment. <b>IA No:</b> BEIS018(F)-18-EDR <b>RPC Reference No:</b> N/A <b>Lead department or agency:</b> Department for Business, Energy and Industrial Strategy <b>Other departments or agencies:</b> N/A	<b>Impact Assessment (IA)</b>			
	<b>Date:</b> April 2018			
	<b>Stage:</b> Final			
	<b>Source of intervention:</b> EU			
	<b>Type of measure:</b> Secondary legislation			
<b>Contact for enquiries:</b> Paul Batty (E: paul.batty@beis.gov.uk; T: 01224 254 043)				
<b>Summary: Intervention and Options</b>			<b>RPC Opinion:</b> Not applicable.	

Cost of Preferred (or more likely) Option				
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANDCB in 2014 prices)	One-In, Three-Out	Business Impact Target Status
-£25.68m	-£25.68m	£1.9m	Not in scope	Non qualifying provision

**What is the problem under consideration? Why is government intervention necessary?**

The proposed Regulations transpose two European Union (EU) Directives that relate to combustion plant used on offshore facilities which undertake hydrocarbon-related activities (oil and gas operations, gas unloading and storage operations and carbon dioxide storage and unloading operations). The two Directives are the Medium Combustion Plant Directive (MCPD) and Chapter III of the Industrial Emissions Directive (IED).

The change introduces new requirements for medium and large combustion plant that are not within the existing regulatory scope and require to be transposed into domestic legislation to remain compliant with EU law. The regulator for implementing these Regulations will be the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) whom regulator the offshore oil and gas industry in other environmental matters. The proposed measures do not go beyond the minimum EU requirements.

**What are the policy objectives and the intended effects?**

The proposed Regulations sets out obligations on industry to permit, control and monitor emissions from medium and large combustion plant.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**

Option 1 - Do nothing: A scenario in which there is no implementation. This is not considered viable, as it would breach EU law.

Option 2 - Transpose MCPD and Chapter III of the IED into domestic law, making use of available flexibility and exemptions where possible. Adopt risk based approach to permitting, compliance and enforcement.

Option 3 - Transpose the MCPD into domestic legislation so that it applies the requirements in full from 20 December 2018 irrespective of plant size. It was considered that this was not feasible, as industry require sufficient time to review and implement any changes to meet the new controls and establish a monitoring regime that would comply. It was also determined that this would be gold plating the MCPD which is not aligned with Government policy.

Option 2 is preferred to ensure compliance with the EU Law whilst making use of the flexibilities and exemptions appropriate to the UK context and recognising that MCP and LCP are not used extensively offshore.

<b>Will the policy be reviewed?</b> It will be reviewed. <b>If applicable, set review date:</b> 2023					
Does implementation go beyond minimum EU requirements?			No		
Are any of these organisations in scope?		<b>Micro</b> Yes	<b>Small</b> Yes	<b>Medium</b> Yes	<b>Large</b> Yes
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)			<b>Traded:</b> NA		<b>Non-traded:</b> NA

*I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.*

**Signed by the responsible Minister:** Claire Perry **Date:** 28 March 2018

# Summary: Analysis & Evidence

# Policy Option 1

## Description:

### FULL ECONOMIC ASSESSMENT

Price Base Year 2017	PV Base Year 2018	Time Period Years 15	Net Benefit (Present Value (PV)) (£m)		
			Low: -13.75	High: -42.34	Best Estimate: -25.68

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0.0	1.2	13.8
High	0.0	3.7	42.3
Best Estimate	0.0	2.3	25.7

#### Description and scale of key monetised costs by 'main affected groups'

All monetised costs in this assessment are treated as direct costs to business. While some enforcement cost and administration costs will fall to BEIS / OPRED, costs will be recovered from operators through fees. Monetised costs consist of abatement costs to meet emission limits, emissions monitoring and administrative costs.

#### Other key non-monetised costs by 'main affected groups'

For some impacts evidence is either not available or collecting it would be disproportionately costly. These include transitional costs (such as communications, guidance, training of regulators and creating tools for permitting and monitoring) and the environmental and human health benefits associated with reductions in emissions offshore due to the introduction of the MCPD and Chapter III of the IED.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0.0	0.0	0.0
High	0.0	0.0	0.0
Best Estimate	0.0	0.0	0.0

#### Description and scale of key monetised benefits by 'main affected groups'

N/A

#### Other key non-monetised benefits by 'main affected groups'

The environmental and human health benefits arising from a reduction in emissions of pollutants has not been quantified. The metrics used to quantify damage costs from air pollution are not suited to application in the remote geographical conditions of the offshore oil and gas industry both from a human health and environmental perspective. Quantifying damage costs is open to significant uncertainty due to the lack of reliable data and other supporting evidence.

#### Key assumptions/sensitivities/risks

As the largest cost in the assessment, the cost and numbers of abatement equipment required are a key area of uncertainty due to the niche technical aspects of the offshore oil and gas sector.

#### Discount rate

3.5

### BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: 1.8	Benefits: 0	Net: -1.8	
			NA

## Introduction

The proposed Regulations sets out obligations on industry to permit, control and monitor emissions from medium (1-50 Megawatt thermal<sup>1</sup> (MWth)) and large combustion plant that are greater than 50MWth (MCP and LCP respectively). The change introduces new requirements for medium and large combustion plant that are not within the existing regulatory scope and require to be transposed into domestic legislation to remain compliant with EU law. The regulator for implementing these Regulations will be the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) whom regulator the offshore oil and gas industry in other environmental matters.

## Direct Costs to Business

Costs to businesses are based upon industry responses to a cost questionnaire<sup>2</sup>, public consultation<sup>3</sup> as well as internal technical knowledge which is broken down into capital and operational expenditure (CAPEX and OPEX), compliance, administrative and monitoring costs for both medium and large combustion plant. It has been assumed any new facilities that use medium and / or large combustion plant would be designed with equipment capable of meeting the emission controls. This could be attributed to the controls put in place by the Directives and domestic legislation and those costs may be equivalent to the cost of retrofitting of existing plant. Although OPEX costs have been taken into account for plant (both medium and large) in future developments. All costs presented are directly applicable to implementing the proposed legislation and does not account for existing costs under the extant 2013 PPC Regulations. Not transposing EU law is not lawful and may result in infraction proceedings being pursued and therefore a 'do nothing' approach is not satisfactory.

The number of affected offshore facilities has been determined as 13, with 24 individual medium combustion plant in total for the MCPD, and two offshore facilities with five large combustion plant. The number of plant has accounted for known cessation of production (i.e. the offshore facility ceases production and commences decommissioning) dates for offshore facilities based upon 2017 data and these have been excluded if no permit is required.

## Compliance

CAPEX costs associated with one-off retrofitting of abatement technology to qualifying plant to comply with emission limit values (ELV) which allow the permissible quantity of a substance contained in waste gases from a combustion plant which may be discharged into the air during a given period. The abatement technology (selective catalytic reduction (SCR)) on which costs was based may not necessarily be applicable to all facilities that the Regulations would apply to. It is acknowledged that other suitable technologies are available but costs have not been quantified for these other technologies as part of this assessment. The SCR CAPEX is dependent upon the electrical rating of the equipment to be abated. Whilst OPEX costs are related to the cost of labour, urea, replacement catalysts, reagents, filters and disposal of waste materials. For all the direct costs to business, compliance is the largest cost impact.

## Assumptions that have been made for compliance

Information on CAPEX and OPEX costs associated with retrofitting abatement technology to ensure compliance with the relevant ELV has been gathered from a number of sources<sup>4</sup>. Costs have been calculated for existing plant on the assumption that nitrogen oxide (NOx) emissions are by far the most

---

<sup>1</sup> Thermal capacity is a function of the equipment's output rating, efficiency and the calorific value of the fuel.

<sup>2</sup> Based on data received from the industry cost questionnaire, March 2017.

<sup>3</sup> <https://beisgovuk.citizenspace.com/energy-development/policy-proposals-for-offshore-combustion-plant/>

<sup>4</sup> (1) Wartsila (2011) Air Emission Solutions, Marketing & Application Development. Presented by Wettstein, R; (2) Danish Maritime Authority. (2012). North European LNG Infrastructure Project - a feasibility study for an LNG filling station infrastructure and test of recommendations; (3) Campling, P., *et al.*, (2013). Specific evaluation of emissions from shipping including assessment for the establishment of possible new emission control areas in European Seas;

(4) Winnes, H., *et al.*, (2016) NOx controls for shipping in EU Seas, Number U 5552; (5) H+H Umwelt Industrietechnik GmbH (2012). Tier 3 SCR solutions and system configurations, Solfic and H+H, presented by de Kock, A.

likely to have an ELV for the offshore oil and gas sector, (due to the predominant use of gas oil and / or gas) for which plant would require abatement to meet the ELV if the plant could not meet the ELV. Selective Catalytic Reduction (SCR) has been used as an example technology for the basis of the costs as it can be retrofitted to existing combustion equipment and it is one of the most established and well-studied NOx abatement technologies available. Although it is acknowledged that this type of abatement may not necessarily apply to all MCP due to the technical configuration of those plant in operation of the offshore platform and industry are free to choose the most appropriate technology for their platform. It is assumed that other similar technology may have similar costs.

The CAPEX costs are presented for retrofitting abatement in 2025 for larger MCP (i.e. greater than 5 MWth) and in 2030 for smaller existing MCP (i.e. between 1 and 5 MWth) must comply with the ELV. When calculating annualised costs, CAPEX costs have been divided between three years as not all operators will undertake retrofitting work at the same time. Costs for abatement have accounted for all known MCP at the respective compliance deadline.

For the 5 qualifying LCP, the same CAPEX approach has been used as MCP, except the cost is in year one. The public consultation did not provide any additional cost data for LCP and the CAPEX costs are based upon assuming that costs will be similar per plant although the electrical rating is reflective of LCP.

The OPEX cost has been calculated using a value of £5 / MWh for each plant. The annual OPEX cost is calculated using an average value SCR running cost (£ / MWh). The annual MWh has been calculated for two categories of medium combustion plant (i.e. 1-5MWth and 5-50MWth ) as well as LCP  $\geq$  50 MWth which reflects the larger costs for large plant. This has been done by calculating the average rating of qualifying combustion equipment and average running hours of qualifying combustion equipment within the two categories and combining these to determine MWh. The annual OPEX cost has been calculated by multiplying running costs in £ / MWh by the MWh. This was combined with the average thermal rating of the MCP or LCP and the average running hours to determine the MWh and generate the Medium annual OPEX cost

### ***Administrative costs***

Associated costs for the regulator and operator with permitting was considered for new permit applications, amendments to existing permits, subsistence, record keeping, compliance maintenance either on an annual (e.g. monitoring) or one off basis (e.g. new permit application). Regulator management of permit non-compliance and transition costs were not included as the proposed measures are not anticipated to result in a significant increase in non-compliances. Familiarisation costs are expected to be low and have not been directly accounted for, as the new requirements are similar to existing regulatory practice under the 2013 PPC Regulations. However, the costs have been estimated to be 5 % (£108,435 medium cost) of the total annualised costs in 2018 and decreasing exponentially thereafter as operators become familiar with the additional requirements.

### **Assumptions made for administration costs**

An hourly rate for calculation of administration costs (Table 1) is based upon separate categories; (a) regulator costs at the known cost per hour which includes both technical and non-technical time at the higher technical rate to account for any uncertainty, and (b) operator costs based upon industry responses to the industry cost questionnaire.

Table 1: Hourly rate for calculation of administration costs.

Elements of total tariff	Regulator Cost (£ / hr.)	Operator Cost (£ / hr.)		
		Low	Medium	High
Hourly rate	168	100	144	187

The number of hours used to monetise operator administration costs with annualised costs is dependent on both one-off and annual costs (Table 2) and therefore will vary from year to year according to new plant and existing plant requiring permitting according to the size of plant for operators and regulator administration costs (Table 2b).

Table 2a: Assumption on the number of hours used to monetise operator administration costs.

Administration category	No. of hours for MCP	No. of hours for LCP	Regulator time for LCP (hours)
New permit application	24	200	40
Amending existing permit	8	6	5
Permit subsistence	4*	20*	5
Record keeping	4*	10*	4
Compliance maintenance	2*	25*	8

\*accounted for an annual cost.

Table 2b: Regulator administration costs.

Administration category	No. of hours for MCP	No. of hours for LCP
New permit application	2.5	40
Amending existing permit	1.5	5
Permit subsistence	5*	5*
Report compilation	37.5**	8*

\*accounted for an annual cost per permit.

\*\*time estimated per report (x3 within the 15 year assessment)

### Emissions monitoring costs

Operators of offshore platforms will be required to monitor emissions at specific frequencies depending upon plant size. For medium combustion plant, costs are considered to be conservative as emissions monitoring is estimated based on monitoring standards currently applied to larger combustion plant on offshore facilities, i.e. the UK Monitoring Certification Scheme (MCERTs). However, the MCERTs standard is considered disproportionate due to its high costs (this also aligns with onshore monitoring proposals). Therefore, cheaper and less stringent methods are being investigated. For the purpose of this assessment we have assumed that MCERTs is required for all plant (in the absence of another European Standard (EN) being identified at this stage) and therefore monitoring costs are likely to be overestimated. Information

on monitoring costs was collected from industry based upon previous experience, and includes hard engineering to fit sample ports for existing plant that are known to require this.

### Assumptions that have been made for emissions monitoring costs

The number of existing offshore facilities required to undertake monitoring for plant < 50 MWth (i.e. MCP) and for LCP commencing 6 months after the transposing Regulations come into force is presented in Table 3.

Table 3: Number of existing offshore facilities with monitoring frequency.

Plant Rating (MWth)	Number of facilities (e.g. platforms)	Frequency
≥ 1 but ≤ 5	5	Every 3 years
> 5 but ≤ 20	3	Every 3 years
> 20 but < 50	4	Annually
≥ 50	2	6 months
≥ 100*	0	Continuous

\*\*LCP monitoring is required to be done every 6 months, although plant greater than 100 MWth are not included as there are none in operation or expected to be in operation on the UKCS.

Information on monitoring costs was provided by operators based on previous experience and is deemed reasonable and representative. A Medium scenario cost of £10,000 per medium combustion plant to fit sample ports has been used based on information provided by operators but it is acknowledged that this number is likely to be highly site specific due to specific technical configuration for each facility. It has been assumed that each existing facility will require one piece of medium combustion plant to have sampling ports fitted and new plant will be built with the required sampling port(s) in place. All new facilities are assumed to have at least one medium combustion plant that is > 20 MWth and therefore require annual monitoring. Sampling ports for qualifying large combustion plant is already in place and therefore no cost impact has been included.

The monitoring costs cover emissions sampling by an accredited UK monitoring company and provision of an emissions monitoring report to the operator. These monitoring costs and the cost of fitting sampling ports are detailed in Table 4. The monitoring costs for large combustion plant have been inflated to reflect the increased frequency at the medium and high cases as there will be efficiencies incurred by contractors at the 6 monthly frequency.

Table 4: Monitoring cost data and assumptions (£).

Cost Source	Low	Medium	High
Monitoring per MCP facility	50,000	65,000	80,000
Monitoring per LCP facility	50,000	75,000	100,000
Fitting Sample Ports per MCP	5,000	10,000	20,000

### Total annualised costs for compliance, administration and monitoring:

The costs are based upon a 15 year (2018-2032) assessment period as this reflects the phased transition of the MCPD and the requirements of Chapter III of the IED coming into force in year 1 (2018) (Table 5).

The later years reflect the phased transition of the MCPD in 2025 when larger medium combustion plant (i.e. greater than 5MWth) and 2030 (smaller medium combustion plant i.e. 1-5MWth) are required to be compliant. All prices are based in 2014 and a 3.5% discount rate has been used in present value figures as per Green Book guidance. The base case is 2018, with the net cost to business per year estimated to be £1.9m over the 15 year assessment period with all costs presented being at the medium cost, i.e. best estimate.

Table 5: Annualised medium costs for compliance, administration and emissions monitoring per year.

Cost category	Annualised costs (£m) in year		
	Year 1 (2018)	2025	2030
Compliance	1.93	2.83	1.74
Administrative	0.03	0.05	0.05
Emissions monitoring	0.22	0.68	0.70

### **Wider Impacts and Transfers**

The main benefit of the implementation of the MCPD and Chapter III of the IED will come from the reduction in air pollutant emissions. By reducing the number of plant operating without abatement and ensuring that these plant are monitored for their emission levels, this will improve air quality and have a positive impact on the environment (including by contributing to the reduction of greenhouse gases) and wider impacts upon climate change.

The expected benefit from the introduction of the proposed Regulations was not quantified for the following reasons:

- The benefit is proportional to the number of combustion plant falling under the scope of the MCPD (24) and Chapter III of the IED (5). There are relatively few MCP and LCP which will be subject to emission controls and therefore the reduction in emissions is limited for the offshore oil and gas sector.
- The metrics used to quantify damage costs from air pollution are not suited to application in the geographically remote conditions of the offshore oil and gas industry both from a human health and environmental perspective. This is further compounded by the prevalence of meteorological conditions that lead to rapid dispersion of emissions and relatively low ground level concentrations in comparison to onshore sites with larger human health impacts.
- Quantifying emissions for the qualifying plant is problematic as these have not been required to undertake monitoring previously and emissions have only been estimated with no actual verification or support sampling of that data. The large combustion plant are new, and undergoing commissioning works and emissions are not directly monitored at the present time. Therefore, it would not be reasonably accurate to use this information in order to determine future reductions as it would be a large area of uncertainty.

Following public consultation, no additional data has been provided by the offshore industry to support the preparation of a robust / reliable environmental benefit assessment.

Wider industry impacts are expected to be under £5m per annum as the key cost impacts have been quantified above. Some aspects have not been quantified due to the excessive time to undertake this coupled with the difficulties quantifying these with an acceptable level of accuracy. The phased transition of medium combustion plant is known for existing plant which comes into effect in 2024 or 2029 when a permit is required to operate qualifying plant although compliance is not required to be achieved until 1 year later. This timing allows adequate planning to be put into place to meet the Regulations.

There is expected to be some financial benefit for service companies that may support offshore operators when fitting abatement technology and / or undertaking emission monitoring. There are no anticipated job losses as a result of the Regulations coming into force.

### **Impacts on Small Businesses**

The proposed Regulations apply to all offshore operators. The Regulations are not expected to have an impact on small businesses, as there are no small businesses that operate an offshore facility and therefore there is no requirement to hold a permit. It is also very unlikely that any offshore operator whom operates an offshore facility would have an annual turnover of less than £10m per annum. As a result, there will be no disproportionate impact on small businesses.