



Department for
Business, Energy
& Industrial Strategy

CBA TOOL USER AID – ADDENDUM FOR OIL & GAS OFFSHORE OPERATORS

IED Article 15(4) Derogation



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Any enquiries regarding this publication should be sent to us at: BST@beis.gov.uk

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Abbreviations

AQMA	Air Quality Management Area
BAT	Best Available Techniques
BAT-AEL	BAT Associated Emission Level
BATc	BAT Conclusions
BEIS	Department for Business, Energy, and Industrial Strategy
BREF	BAT Reference Document
CA	Competent Authority
CBA	Cost Benefit Analysis
DEFRA	The Department for Environment, Food & Rural Affairs
EA	Environment Agency
ELVs	Emission Limit Values
EU	European Union
GHG	Greenhouse Gas Emissions
IED	Industrial Emissions Directive
LCP	Large Combustion Plant
LCP BREF	Large Combustion Plant BAT Reference Document
NOx	Nitrogen Oxides
OCGT	Open Cycle Gas Turbine
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
PPC Regulations	The Offshore Combustion Installations (Prevention and Control of Pollution) Regulations 2013 (as amended)
tCO ₂ e	Tonnes of Carbon Dioxide Equivalent

Introduction

This guidance is issued by the Department of Business, Energy and Industrial Strategy (BEIS), through its Offshore Petroleum Regulator for Environment and Decommissioning (OPRED).

The Offshore Combustion Installations (Prevention and Control of Pollution) Regulations 2013 (as amended) transposed the Industrial Emissions Directive 2010/75/EU (IED) into UK law. The European Union (EU) published the update to the Large Combustion Plant (LCP) best available techniques (BAT) reference document (BREF) and the associated BAT conclusions (BATc) in August 2017. The LCP BATc included BAT-associated emission levels (BAT-AELs) specific to the offshore oil and gas sector that are applicable to open-cycle gas turbines operating on gaseous fuels. Under the IED, compliance with the requirements of the BATc and any BAT-AELs must be achieved within four years of the publication of the LCP BATc, which corresponds to 18th August 2021. Article 15(4) of the IED allows the competent authority (CA) to set emission limit values (ELVs) less strict than the BAT-AELs by means of derogation from Article 15(3). Derogations as per Article 15(4) may only apply where an assessment shows that achievement of the BAT-AELs would lead to disproportionately higher costs compared to the environmental benefits due to:

- the geographical location of the local environmental conditions of the installation concerned; or
- the technical characteristics of the installation concerned.

When a PPC permit holder, with OCGT classed as LCP, needs to make a request for derogation from the BAT-AELs, this process must involve an assessment to demonstrate the disproportionality of the costs and benefits of complying with the BAT-AEL.

OPRED published guidance for the offshore oil and gas industry on the LCP BREF BATc and derogation under Article 15(4) in July 2020. This requires that a cost benefit analysis (CBA) is the basis of the quantitative assessment to be used in requests for derogation, and advised that the CBA tool developed by The Department for Environment, Food & Rural Affairs (DEFRA) and the Environment Agency (EA) should be used.

Purpose

The EA published an IED derogation CBA tool and an associated user guide, which are available online at the address below.

<https://www.gov.uk/government/publications/industrial-emissions-directive-derogation-cost-benefit-analysis-tool>

The CBA tool and associated user guide were developed by the EA to inform the assessment for a request for derogation from the requirements of the IED. Its suitability for the offshore oil and gas sector has been assessed.

This document is designed as an offshore oil-and-gas-specific addendum to the IED derogation CBA tool user guide published by the EA (available at the link shown above) and

should be used in conjunction with that guidance. The purpose of this document is to aid offshore oil and gas operators by highlighting those sections of the tool that require additional offshore-specific input, and those areas which are specific to onshore industries only and therefore are not relevant for offshore users.

1.0 Title worksheet

The existing EA CBA tool user guidance should be referred to for guidance on how to begin the assessment with the CBA tool and how to navigate through the tool.

2.0 Derogation case description

Step 1 involves providing background details about your derogation application. You must input the required details for each of the options that form the basis of their CBA. The options include three fixed options which must be included and up to three additional options. The fixed options which must be included are:

- the business as usual (BAU) option;
- the option that achieves compliance with the BAT-AELs by the compliance date; and
- the alternative option(s) considered, including your preferred derogation option.

The BAU option represents the profile you would have followed in the absence of the LCP BAT-AELs. The BAT-AELs option represents the steps required to achieve the BAT-AELs by the compliance date set out in the BREF. The proposed derogation option is the alternative option you are putting forward as the derogation option. This should have been derived as a result of an options appraisal process. There is space in the tool to include up to three of the other alternative options that were considered as part of your options appraisal process. A report on the outcomes of the options appraisal process may be submitted as supporting qualitative information, particularly where this demonstrates the robustness of the data input to the CBA tool.

There is no further offshore-specific guidance required in order to complete this worksheet of the CBA tool.

3.0 Qualitative assessment

The assessment of requests for derogation will not rely solely on the outcomes of the quantitative CBA. There is provision in step 2 of the CBA tool to provide qualitative information the applicant considers important to their request for derogation. The applicant may choose to provide qualitative information through this section of the CBA tool. You should refer to the EA

CBA tool user guidance on how to complete this section. If an applicant wishes to supply qualitative information that is not covered by any of the subcategories listed under this part of the tool, they may provide the information using the row marked 'other (please specify)'. Users have full manual control over the addition of information via such rows. This has been highlighted by the red dashed outline in Figure 1 below. As an example, offshore oil and gas operators may choose to provide qualitative information related to energy efficiency here. Operators who wish to provide qualitative information in an alternative format out-with the CBA tool, for example, their options appraisal assessment, should discuss this with their environmental manager at OPRED

---- Step 2 - Qualitative Assessment of Environmental Impacts ---- << MAIN MENU

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What is this worksheet for?
Use this worksheet to record factors that the tool cannot quantify but that are important in weighing up your various options.

Environmental impact category	Applicable?	Description of impact (?)	How significant is this impact? (?)	Comment on significance
2.1 Business as Usual (BAU)				
Air pollutant emissions	Yes			
Greenhouse gas emissions				
Emissions to water				
Emissions to land or soil				
Noise				
Visual				
Odour				
Waste				
Other (please specify)				

Figure 1: Step 2 qualitative assessment with other additional user input.

4.0 General data input

Step 3 in the CBA is the General Data Input worksheet. This worksheet is used to set the appraisal period and provide key data required for the analysis.

The options appraisal process used to derive the proposed derogation and other alternative options put forward within the CBA will require input from various disciplines to derive robust costs for use in the CBA.

For example, in this section, the user may provide the range (central, low and high) of weighted average cost of capital (WACC) if they wish to have that WACC range automatically applied to their cost of capital.

You should follow the instructions given in the EA's CBA tool user guidance for this section. However, choice of river catchment area, which is not relevant to offshore oil and gas operators, is no longer an option in the tool, and all offshore operators should indicate their installation is not within an Air Quality Management Area (AQMA).

5.0 Data input for scenarios

The information in the EA's CBA user guidance should be referred to in the first instance when inputting data for each of the options/scenarios you are representing with the CBA tool. You should note you are required to complete the 'Data Input' worksheet for each of the options covered in 'Step 1 – Derogation Case Description'.

For some data inputs there are several subcategories listed. Some inputs will not be relevant for offshore oil and gas operators. Where a subcategory item listed in a yellow cell for example, 'Land' is not relevant you can overwrite it, replacing it with a subcategory that is relevant. There is space to enter additional subcategories in the spaces marked 'other (please specify)', which is highlighted by the red dashed outline in Figure 2. There will not be an option to add more than one additional subcategory for each input. Values for subcategories that are not relevant can be left blank.

--- Step 4 - Data Input - Business as Usual (BAU) ---

<< MAIN MENU SKIP TO SUMMARY >>

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What is this worksheet for?
Use this worksheet to enter information below about what you were planning to do on your site before the publication of the relevant Bref for your sector.

Copy Values from Another Option

Year number	0	1	2
Year	2020	2021	2022

BAU (?)

Upfront investment costs (?)

VIEW UNDERLYING CALCULATIONS SHEET >> VIEW SENSITIVITY ANALYSIS >>

Equipment	£000's	Year 0 (2020)	Year 1 (2021)	Year 2 (2022)
4.1 Primary emission control equipment	£000's			
4.2 Auxiliary equipment	£000's			
4.3 Instrumentation	£000's			
4.4 Modifications to existing equipment	£000's			
4.5 Major refurbishment	£000's			
Set-up costs				
4.6 Land	£000's			
4.7 Site preparation	£000's			
4.8 Civils	£000's			
4.9 Materials	£000's			
4.10 Other (please specify)	£000's			
Other capex				
4.11 Residual value of existing technology (where replaced)	£000's			
4.12 Project planning (if not in civils)	£000's			
4.13 Other (please specify)	£000's			
Total upfront investment costs by year (non-discounted)	£000's (Auto calculated value)	£0	£0	£0
Total upfront investment costs for all years (non-discounted)	£000's (Auto calculated value)	£0		
4.14 Uncertainty range around upfront investment costs	+/-%			

Figure 2: Additional user inputs to subcategories are made using the fields marked 'other (please specify)'.

5.1 Upfront investment costs

Upfront investment costs are divided into the subcategories equipment, set-up costs, and other CAPEX. The upfront costs should be entered in the appropriate year as per the instructions provided in the EA's CBA tool user guidance.

The EA's CBA tool user guide provides clarification on the concept of lost years of operation where it is required to replace equipment installed before the beginning of the appraisal period before the end of its expected lifetime in order to comply with the IED. Lost output resulting from the requirement to shut down the plant to accommodate the required works for each option can be accounted for in the tool. However, if the shutdown is part of a normal planned shutdown and not solely for the purposes of carrying out works to comply with the BAT-AEL, then inputs related to lost output should not be included. The lost output can reflect the profit lost as a result of the shutdown, but should not include costs incurred as a result of the shutdown such as wages for example.

Lost output as a result of restricting operations could form part of one or more scenarios put forward in the CBA. This should be reflected in the upfront investment costs as the tool will compare the costs of the BAT-AEL scenario and the other options with those of the proposed derogation. Users are reminded they may overwrite any subcategory given in a yellow cell and add ones they feel are more reflective of their data.

5.2 Financing costs, operating costs and waste output

Please refer to the EA's CBA tool user guidance in relation to the inputs required under the categories 'cost of capital (financing)' and 'operating costs' and for further explanation of the concepts involved.

5.3 Energy consumption

The value of energy consumption associated with the fuels listed in the subcategories provided by the tool is automatically calculated within the tool by combining the quantities consumed with the retail energy prices from BEIS. Therefore, as the subcategories for fuels provided under 'Quantities of energy consumed' are linked in the tool to retail prices for the calculation of values, there is no option to overwrite the subcategories here. As the retail prices associated with the energy subcategories provided in the tool are onshore-based, offshore oil and gas operators should not enter quantities of energy consumed under the energy subcategories given as defaults in the CBA tool. Accordingly, as an offshore oil and gas operator, you are required to enter one value for the total energy quantity consumed in the row marked 'other (please specify)'. This total fuel quantity should be a summation of all fuel types used on the installation to generate energy. For example, this could include self-generated fuel gas, imported gas, and marine gas oil (Figure 3). The unit of measurement field can be overwritten and the unit of measurement for the 'other' field should be provided. It is expected that justification for the costs provided is submitted as supporting information along with the CBA.

Whilst it is unlikely that onshore-based energy prices would apply to CBA options put forward by offshore oil and gas operators, if it is expected that onshore-based energy prices would apply then the applicant should enter the quantities of energy consumed under the subcategories listed as relevant and provide a justification as supporting information to accompany the CBA.

CBA Tool User Aid – Addendum for Oil and Gas Operators

---- Step 4 - Data Input - Business as Usual (BAU) ----

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What is this worksheet for?
Use this worksheet to enter information below about what you were planning to do on your site before the publication of the relevant Bref for your sector.

Copy Values from Another Option

Year number	0	1	2	3
Year	2020	2021	2022	2023
4.40 Other (please specify)				
Total cost of waste output	£0	£0	£0	£0
Energy Consumption				
Quantity of energy consumed				
4.41 Electricity				
4.42 Natural Gas				
4.43 Coal				
4.44 Gas Oil				
4.45 Road - Petrol				
4.46 Road - Diesel				
4.47 Other (please specify)				
Value of energy consumed				
Electricity	£0	£0	£0	£0
Natural Gas	£0	£0	£0	£0
Coal	£0	£0	£0	£0
Gas Oil	£0	£0	£0	£0
Road - Petrol	£0	£0	£0	£0
Road - Diesel	£0	£0	£0	£0
4.48 Other (please specify)				
Total cost of energy	£0	£0	£0	£0

Figure 3: Quantity of energy consumed must be entered under the 'other (please specify)' field and the units of measurement should also be provided.

Under 'Value of energy consumed' users are also required to manually enter a value for their energy consumption in the row highlighted by the red dashed outline in Figure 4. The tool will then automatically calculate the total cost of energy in the field below this.

---- Step 4 - Data Input - Business as Usual (BAU) ----

< PREVIOUS NEXT >

What is this worksheet for?
Use this worksheet to enter information below about what you were planning to do on your site before the publication of the relevant BREF for your sector.

Copy Values from Another Option

Year number	0	1	2	3		
Year	2020	2021	2022	2023		
4.40 Other (please specify)	£000's					
Total cost of waste output	£000's	(Auto calculated value)	£0	£0	£0	£0
Energy Consumption						
Quantity of energy consumed						
4.41 Electricity	kWh					
4.42 Natural Gas	kWh					
4.43 Coal	kWh					
4.44 Gas Oil	litres					
4.45 Road - Petrol	litres					
4.46 Road - Diesel	litres					
4.47 Other (please specify)	kWh					
Value of energy consumed						
Electricity	£000's	(Auto calculated value)	£0	£0	£0	£0
Natural Gas	£000's	(Auto calculated value)	£0	£0	£0	£0
Coal	£000's	(Auto calculated value)	£0	£0	£0	£0
Gas Oil	£000's	(Auto calculated value)	£0	£0	£0	£0
Road - Petrol	£000's	(Auto calculated value)	£0	£0	£0	£0
Road - Diesel	£000's	(Auto calculated value)	£0	£0	£0	£0
4.48 Other (please specify)	£000's					
Total cost of energy	£000's	(Auto calculated value)	£0	£0	£0	£0

Figure 4: The value of the energy consumed must be entered manually for each year of the appraisal period. The tool will then automatically calculate the 'Total cost of energy' in the field below.

5.4 Environmental Impacts

Environmental impacts are divided into the subcategories air pollutant emissions, process-related GHG emissions, and fuel-related GHG emissions. The EA's CBA tool user guidance explains how the tool assesses and compares the change in emissions brought about by each option.

There are no damage costs for air pollutant emissions that are specific to the offshore environment built into the CBA tool. An assessment of the suitability to use existing damage costs for the UK on offshore oil and gas installations was undertaken. The UK's existing damage costs datasets are derived for onshore areas with varying levels of population density.

DEFRA published updated damage costs for the UK in 2020. This includes national average damage costs and sector-specific damage costs. The sector-specific damage costs include Part A sector damage costs. Part A refers to emissions from large industrial processes. The variability of the impact of Part A emissions is dependent upon the density of the population affected and the height of the stacks. Table 1 gives a breakdown of the Part A sector damage cost categories.

Further information on recent updates to air quality damage costs can be found at:

<https://www.gov.uk/government/publications/assess-the-impact-of-air-quality>

Table 1: DEFRA Part A sector damage cost category basis.

Average population density (persons per km squared)	Stack height <= 50m and all small point	Stack height > 50m, <= 100m	Stack height > 100m
<= 250	Category 1	Category 4	Category 7
> 250, <= 1000	Category 2	Category 5	Category 8
> 1000	Category 3	Category 6	Category 9

For Part A sector Nitrogen Oxides (NOx) damage cost, category 7 represents the lowest population density and the greatest stack height. It is acknowledged that damage costs derived for onshore are likely to overestimate the impact for the offshore environment. In the absence of offshore-specific damage costs the department proposes to use the Part A sector NOx damage costs as they represent the lowest population density and taller stack heights. This represents a conservative assessment. You should review the sensitivity of the Part A sector NOx damage costs to your CBA outcomes, and where relevant you should consider submitting a qualitative assessment to support this, for consideration by the department.

Under air pollutant emissions on the CBA tool you are required to select 'NOX Part A Category 7' from the dropdown menu as shown in Figure 5, and then to enter quantities of NOx emissions for each year of the appraisal period in the yellow boxes. You are only required to complete air pollutant emissions for NOx. Carbon dioxide and carbon monoxide emissions are not included in the list of damage costs addressed under 'air pollutant emissions'. These are considered under greenhouse gas (GHG emissions).

---- Step 4 - Data Input - Business as Usual (BAU) ----

< PREVIOUS NEXT >

What is this worksheet for?
Use this worksheet to enter information below about what you were planning to do on your site before the publication of the relevant Bref for your sector.

Copy Values from Another Option

Year number	0	1	2
Year	2020	2021	2022
Environmental impacts			
Air pollutant emissions			
4.49	NOX Part A Category 7	Tonnes	<(Select from dropdown)
		Tonnes	<(Select from dropdown)
		Tonnes	<(Select from dropdown)
		Tonnes	<(Select from dropdown)
		Tonnes	<(Select from dropdown)
		Tonnes	<(Select from dropdown)

Figure 5: Selection of NOX Part A category 7 damage cost.

Air pollutant damage costs sourced from the European Environment Agency (EEA) will be used by the tool automatically as part of the sensitivity analysis.

Process-related GHG emissions:

Process-related GHG emissions are not likely to be required, however, if your installation has 'process-related GHG' emissions, i.e. non-combustion derived GHG, emissions the tool can account for this. You should select the GHG emission type from the dropdown menu (indicated by the red dashed outline in Figure 6) and enter the quantity of emissions for each year of the appraisal period.

Fuel-related GHG emissions:

The quantity of GHG emissions related to the combustion of the quantity of fuel used to generate energy, (see Section 5.3 and Figure 3) is required and must be entered as tonnes of carbon dioxide equivalent (tCO₂e). Under 'fuel-related' GHG emissions you are required to enter the summed total GHG emissions as tCO₂e in the yellow box for each appraisal year (indicated by the green dashed outline in Figure 6). The tool will automatically calculate a value for the GHG emissions by applying a carbon price to the quantity entered.

---- Step 4 - Data Input - Business as Usual (BAU) ----

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What is this worksheet for?
Use this worksheet to enter information below about what you were planning to do on your site before the publication of the relevant BREF for your sector.

Copy Values from Another Option

		Year number	0	1	2
		Year	2020	2021	2022
Air pollutant emissions					
4.49	NOX Part A Category 7	Tonnes	<(Select from dropdown)		
		Tonnes	<(Select from dropdown)		
		Tonnes	<(Select from dropdown)		
		Tonnes	<(Select from dropdown)		
		Tonnes	<(Select from dropdown)		
		Tonnes	<(Select from dropdown)		
'Process-related' GHG emissions					
4.50		Tonnes	<(Select from dropdown)		
4.51	Additional emission type (please specify)	tCO ₂ e			
Total process GHG Emissions		tCO ₂ e	(Auto calculated value)	0	0
'Fuel-related' GHG emissions					
	Electricity	tCO ₂ e	(Auto calculated value)	0	0
	Natural Gas	tCO ₂ e	(Auto calculated value)	0	0
	Coal	tCO ₂ e	(Auto calculated value)	0	0
	Gas Oil	tCO ₂ e	(Auto calculated value)	0	0
	Road - Petrol	tCO ₂ e	(Auto calculated value)	0	0
	Road - Diesel	tCO ₂ e	(Auto calculated value)	0	0
4.52	Other (please specify)	tCO ₂ e			
Total fuel-related GHG Emissions		tCO ₂ e	(Auto calculated value)	0	0

Figure 6: Process-related and fuel-related GHG emissions

5.5 Emissions to water

The current version of the CBA tool no longer provides an option to capture emissions to water. It is not expected that consideration will need to be made for emissions to water in the CBA for derogation from the LCP NO_x BAT-AEL. However, if emissions to water are relevant to an option to be put forward in the CBA by the user, it may be recorded through inclusion in the qualitative assessment included within the CBA tool or as part of qualitative information to be submitted in support of the CBA.

6.0 Results

Please refer to the existing EA CBA tool user guidance for a description of the results section of the tool. Offshore oil and gas users should note the version of the tool recommended for use does not contain a scenario analysis for water and that Section 6.1 of the existing EA CBA tool user guidance can be ignored.

7.0 Supporting Information

Offshore oil and gas operators are referred to Section 7 of the existing EA CBA tool user guidance, the Appraisal Checklist, as a guide to making relevant checks before the CBA is submitted to the department.

Data presented in the CBA must be robust. Offshore oil and gas operators must submit supporting information as evidence for the CBA input data. In addition, any information the applicant considers pertinent to the application that cannot be expressed in a quantitative manner must be submitted as supporting qualitative information. This may be submitted along with the CBA tool to the department as a separate document.

Applicants are also reminded that if there is insufficient evidence to demonstrate and support the data in the CBA, the department may request further information. If there is insufficient information to support the CBA the department cannot accept and will refuse a derogation application.

References

Department for Environment Food & Rural Affairs. (2020, May). Air quality appraisal: damage cost guidance. Retrieved from <https://www.gov.uk/government/publications/assess-the-impact-of-air-quality/air-quality-appraisal-damage-cost-guidance>

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