

Environment Agency

Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2016

Decision document recording our decision-making process following review of a permit

The Permit number is: EPR/TP3538GF
The Operator is: MGT Teesside Limited
The Installation is: Tees Renewable Energy Plant
This Variation Notice number is: EPR/TP3538GF/V004

What this document is about

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication of updated decisions on best available techniques (BAT) conclusions.

We have reviewed the permit for this installation against the revised BAT Conclusions for large combustion plant published on 17th August 2017. This is our decision document, which explains the reasoning for the consolidated variation notice that we are issuing.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing best available techniques (BAT) conclusions ('BAT Conclusions') for large combustion plant as detailed in document reference IEDC-7-1. It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as considering the review of the operating techniques used by the Operator for the operation of the plant and activities of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit

issued. It also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the Permit consistent with our current general approach and philosophy and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have been removed because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the Permit in any way. In this document we therefore address only our determination of substantive issues relating to the new BAT Conclusions.

This is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position.

Throughout this document we will use a number of expressions. These are as referred to in the glossary and have the same meaning as described in “Schedule 6 Interpretation” of the Permit.

We try to explain our decision as accurately, comprehensively and plainly as possible. We would welcome any feedback as to how we might improve our decision documents in future. A lot of technical terms and acronyms are inevitable in a document of this nature: we provide a glossary of acronyms near the front of the document, for ease of reference.

How this document is structured

Glossary of terms

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Glossary of acronyms used in this document

(Please note that this glossary is standard for our decision documents and therefore not all these acronyms are necessarily used in this document.)

APC	Air Pollution Control
BAT	Best Available Technique(s)
BAT-AEEL	BAT Associated Energy Efficiency Level
BAT-AEL	BAT Associated Emission Level
BATc	BAT conclusion
BREF	Best available techniques reference document
CEM	Continuous emissions monitor
CHP	Combined heat and power
CV	Calorific value
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
EIONET	European environment information and observation network is a partnership network of the European Environment Agency
ELV	Emission limit value derived under BAT or an emission limit value set out in IED
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2016 (SI 2016 No. 1154)
EWC	European waste catalogue
FSA	Food Standards Agency
IED	Industrial Emissions Directive (2010/75/EU)
IPPCD	Integrated Pollution Prevention and Control Directive (2008/1/EC) – now superseded by IED
LCP	Large Combustion Plant subject to Chapter III of IED
MSUL/MSDL	Minimum start up load/minimum shut-down load
NO _x	Oxides of nitrogen (NO plus NO ₂ expressed as NO ₂)
NPV	Net Present Value
PHE	Public Health England
SAC	Special Area of Conservation
SGN	Sector guidance note
TGN	Technical guidance note
TOC	Total Organic Carbon
WFD	Water Framework Directive (2000/60/EC)

1 Our decision

We have decided to issue the consolidated variation notice to the Operator. This will allow it to continue to operate the Installation, subject to the conditions in the consolidated variation notice.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The consolidated variation notice contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our Permit template provides two or more options.

2 How we reached our decision

2.1 Requesting information to demonstrate compliance with BAT Conclusions for Large Combustion Plant

We issued a Notice under Regulation 61(1) of the Environmental Permitting (England and Wales) Regulations 2016 (a Regulation 61 Notice) on 1st May 2018 requiring the Operator to provide information to demonstrate how the operation of their installation currently meets, or will subsequently meet, the revised standards described in the large combustion plant BAT Conclusions document. The Notice also required that where the revised standards are not currently met, the operator should provide information that:

- Describes the techniques that will be implemented before 17th August 2021, which will then ensure that operations meet the revised standard, or
- Justifies why standards will not be met by 17th August 2021, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- Justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.

Where the Operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT AEL) described in the BAT Conclusions Document, the Regulation 61 Notice requested that the Operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 61 Notice response from the Operator was received on 31/12/18.

We considered that the response did not contain sufficient information for us to commence the permit review. We therefore issued a further information request to the Operator on 30/10/19. Suitable further information was provided by the Operator on 21/11/19 and 10/12/19.

2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous regulatory activities with the facility we have no reason to consider that the operator will not be able to comply with the conditions that we include in the permit.

In relation to BAT Conclusions 1, 2, 4, 9, 10, 12 and table 8 we agree with the operator in respect to their current stated capability as recorded in their Regulation 61 Notice response that improvements are required.

We have therefore included improvement conditions IC4, IC5, IC6 and have amended preoperational condition POC4 in the consolidated variation notice, which requires them to upgrade their operational techniques so that the requirements of the BAT Conclusion are delivered by 17 August 2021. This is discussed in more detail in the key issues section and/or in the decision checklist regarding relevant BAT Conclusions.

3 The legal framework

The consolidated variation notice will be issued under Regulation 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that the consolidated variation notice will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

4 The key issues

The key issues arising during this permit review are:

- Emissions to air and the emission limits applied to the plant.
- The energy efficiency levels associated with the Best Available Techniques (BAT-AEELs)
- Environment Management System
- Characterisation of fuel
- Monitoring Standards

We therefore describe how we determined these issues in most detail in the relevant sections of this document.

4.1 Emissions to air and the emission limits applied to the plant

A number of general principles were applied during the permit review. These included:

- The upper value of the BAT AELs ranges specified were used unless use of the tighter limit was justified.
- The principle of no backsliding where if existing limits in the permit were already tighter than those specified in the BREF, the existing permit limits were retained.
- Where a limit was specified in both IED Annex V and the BAT Conclusions for a particular reference period, the tighter limit was applied and in the majority of cases this was from the BAT Conclusions.
- Where AELs are indicative in the BAT Conclusions, these were applied unless adequate justification was provided by the operator to demonstrate that an alternative limit was more appropriate.

The LCP on site is referenced as LCP403 and is a biomass fired boiler with a thermal input of 669.3 MWth. There is also an auxiliary boiler fired on gas oil with a thermal input of 30.19 MWth. The total aggregated thermal input on site is 699.49 MWth.

The plant will be put into operation after IED came into force and therefore the existing limits in the permit are from Part 2 of IED Annex V applicable to new plant.

The ELVs and AELs are based on the following operating regime:

- Unlimited hours operation

The following tables outline the limits that have been incorporated into the permit for LCP403, where these were derived from and the reference periods

at which they apply. The emission limits refer to concentrations, expressed as mass of emitted substance per volume of flue-gas under the following standard conditions: dry gas at a temperature of 273,15 K, pressure of 101,3 kPa and 6% select correct oxygen reference value for plant volume reference oxygen concentration if flue gases. The emission limits and monitoring requirements have been incorporated into Schedule 3 of the permit.

NOx limits (mg/Nm ³)						
Averaging	IED (Annex V Part 2) - New	BREF (Table 9 BAT-c)	Expected permit limits	Basis	Limits apply	Monitoring
Annual	None	150	150	BREF	MSUL/MSDL to baseload	Continuous
Monthly	150	None	150	IED	MSUL/MSDL to baseload	
Daily	165	165	150	Existing Permit	MSUL/MSDL to baseload	
95 th %ile of hr means	300	None	300	IED	MSUL/MSDL to baseload	

Under the no backsliding rule the Daily limit will be 150 mg/Nm³

CO limits (mg/Nm ³)						
Averaging	IED (Annex V Part 2) - New	BREF (Table 9 BAT-c)	Expected permit limits	Basis	Limits apply	Monitoring
Annual	None	80	80	BREF	MSUL/MSDL to baseload	Continuous

SO ₂ limits (mg/Nm ³)						
Averaging	IED (Annex V Part 2) - New	BREF (Table 10 BAT-c)	Expected permit limits	Basis	Limits apply	Monitoring
Annual	None	50	50	BREF	MSUL/MSDL to baseload	Continuous
Monthly	150	None	53	Existing Permit	MSUL/MSDL to baseload	
Daily	165	85	85	BREF	MSUL/MSDL to baseload	
95 th %ile of hr means	300	None	300	IED	MSUL/MSDL to baseload	

Under the no backsliding rule the Monthly limit will be 53 mg/Nm³

HCl limits (mg/Nm ³)						
Averaging	IED (Annex V Part 2) - New	BREF (Table 11 BAT-c)	Expected permit limits	Basis	Limits apply	Monitoring
Annual	None	5	5	BREF	MSUL/MSDL to baseload	Continuous
Daily	None	12	12	BREF	MSUL/MSDL to baseload	

HF limits (mg/Nm ³)						
Averaging	IED (Annex V Part 2) – New	BREF (Table 11 BAT-c)	Expected permit limits	Basis	Limits apply	Monitoring
Average over sampling period	None	< 1	< 1	BREF	MSUL/MSDL to baseload	Once per year

Dust limits (mg/Nm ³)						
Averaging	IED (Annex V Part 2) – New	BREF (Table 12 BAT-c)	Expected permit limits	Basis	Limits apply	Monitoring
Annual	None	10	10	BREF	MSUL/MSDL to baseload	Continuous
Monthly	20	None	10	Existing Permit	MSUL/MSDL to baseload	
Daily	22	16	10	Existing Permit	MSUL/MSDL to baseload	
95 th %ile of hr means	40	None	40	IED	MSUL/MSDL to baseload	

Under the no backsliding rule the Monthly and Daily limits will both be 10 mg/Nm³.

NH ₃ limits (mg/Nm ³)						
Averaging	IED (Annex V Part 2) - New	BREF (BAT conclusion 7)	Expected permit limits	Basis	Limits apply	Monitoring
Yearly	None	15	5	Existing Permit	MSUL/MSDL to baseload	Continuous

Under the no backsliding rule the yearly limit will be 5 mg/Nm³

Hg limits (µg/Nm ³)						
Averaging	IED (Annex V Part 2) - New	BREF (BAT conclusion 27)	Expected permit limits	Basis	Limits apply	Monitoring
Average over sampling period	None	5	5	BREF	MSUL/MSDL to baseload	Once per year

4.2 The energy efficiency levels associated with the Best Available Techniques Conclusions

An energy efficiency level associated with the best available techniques (BAT-AEEL) refers to the ratio between the combustion unit's net energy output(s) and the combustion unit's fuel/feedstock energy input at actual unit design. The net energy output(s) is determined at the combustion unit boundaries, including auxiliary systems (e.g. flue-gas treatment systems), and for the unit operated at full load.

The table below sets out the BAT-AEELs specified in the LCP BAT Conclusions for the large combustion plant on the site and the energy efficiency levels confirmed through the Regulation 61 notice response. The operator has not provided a figure for the energy efficiency of the plant. Preoperational condition (POC7) has been included requiring that this is provided before July 2021.

BAT AEELs (%)			Plant efficiency (%)		
Net electrical efficiency	Net total fuel utilisation	Net mechanical efficiency	Net electrical efficiency	Net total fuel utilisation	Net mechanical efficiency
LCP403: unit description from the AEEL table					
28 – 38%	None	None	-	NA	NA

BAT 2 requires the operator to determine net electrical efficiency at a full load following commissioning of the unit and after each subsequent modification. The net electrical efficiency must be in accordance with the BAT-AEEL range specified in table 8 of the Large Combustion Plant (LCP) BAT Conclusions document. The commissioning of this LCP has not yet commenced. These details are not available.

BAT 12 requires the operator to provide details of the energy efficiency measures that are in place at the installation.

We have therefore included an improvement condition (IC) in the consolidated variation notice IC5 requiring the operator to submit a report outlining the energy efficiency of the plant and the energy efficiency techniques that will be in place prior to the implementation date for the BAT Conclusions.

4.3 Environment Management System

BAT 1 requires the operator to have an environment management system (EMS) in place that addresses all relevant points (i) – (xvi) as specified under this BAT conclusion. BAT 10 requires the operator to have a management plan as part of the EMS describing how the site will manage emissions during other than normal operating conditions (OTNOC).

We have therefore modified preoperational condition (POC4) to include a requirement to update the EMS to include procedures that cover the requirements of points (i) – (xvi) as specified under BAT 1 and to describe emissions management during ONTOC, 4 weeks prior to any fuel being burnt at the installation.

4.4 Fuel characterisation

BAT 9 requires the operator to carry out fuel characterisation. The commissioning of the plant had not yet been completed. As a result the fuel has not yet been characterised as required under point i) of this BAT

conclusion. Criteria ii) in relation to the regular testing of fuels and iii) in relation to incorporating the fuel characterisation changes identified as a result of regular testing back into the control system to improve performance have not been developed.

We have therefore included an improvement condition (IC) in the consolidated variation notice IC4 requiring the operator to submit a plan outlining how this will be carried out for approval prior to the implementation date for the BAT Conclusions.

4.5 Monitoring Standards

BAT 4 specifies the monitoring standards that need to be in place depending on the fuel that is burnt. The operator has confirmed that they will be in compliance with the requirements of BAT 4. Where specific monitoring standards are stipulated these have been incorporated into the permit. Where generic standards are specified the operator is not able to specify what standard will be in place.

We have therefore included an improvement condition (IC) in the consolidated variation notice IC6 requiring the operator to submit a plan outlining the monitoring standards that will be in place prior to the implementation date for the BAT Conclusions.

5 Decision checklist regarding relevant BAT Conclusions

BAT Conclusions for large combustion plant, were published by the European Commission on 17th August 2017. There are 75 BAT Conclusions. Only the BAT Conclusions relevant to the particular fuel type used on site have been replicated below.

This annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the Consolidated Variation Notice.

The conditions in the permit through which the relevant BAT Conclusions are implemented include but are not limited to the following:

BAT Conclusion requirement topic	Permit condition(s)	Permit table(s)
Environmental Management System	1.1.1	S1.2
BAT AELs	3.1.1 and 3.5.1	S3.1a
Monitoring	2.3, 3.5 and 3.6	S3.1, S3.1a, S3.2
Energy efficiency	1.2 and 2.3	S3.3
Noise	3.4 and 2.3	S1.2

Other operating techniques	2.3	S1.2
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The overall status of compliance with the BAT conclusion is indicated in the table as:

- NA Not Applicable
- CC Currently Compliant
- FC Compliant in the future (within 4 years of publication of BAT conclusions)
- NC Not Compliant
- PC Partially Compliant

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
General			
1	<p>In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features:</p> <ul style="list-style-type: none"> i. commitment of the management, including senior management; ii. definition of an environmental policy that includes the continuous improvement of the installation by the management; iii. planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment; iv. implementation of procedures <ul style="list-style-type: none"> (a) Structure and responsibility (b) Training (c) Communication (d) Employee involvement (e) Documentation (f) Efficient process control (g) Maintenance programmes (h) Emergency preparedness and response (i) Safeguarding compliance with environmental legislation v. checking performance and taking corrective action, paying particular attention to: <ul style="list-style-type: none"> (a) monitoring and measurement (see also the Reference Document on the General Principles of Monitoring) (b) corrective and preventive action (c) maintenance of records (d) independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained; vi. review of the EMS and its continuing suitability, adequacy and effectiveness by senior management; vii. following the development of cleaner technologies; viii. consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life; viii. consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life; ix. application of sectoral benchmarking on a regular basis. <p>Etc - see BAT Conclusions</p>	FC	<p>The operator has confirmed the following:</p> <p>A site specific Environment Management System (EMS) is not yet in place. Preoperational Condition 4 has been updated to require that all of the points (i) – (xvi) are incorporated into the EMS.</p>

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																		
	Applicability. The scope (e.g. level of detail) and nature of the EMS (e.g. standardised or non-standardised) will generally be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have.																				
2	BAT is to determine the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the gasification, IGCC and/or combustion units by carrying out a performance test at full load (1), according to EN standards, after the commissioning of the unit and after each modification that could significantly affect the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the unit. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.	FC	A performance test will be completed once the plant has been commissioned. Improvement Condition 5 (IC5) has been included requiring that a report is provided detailing what the net energy efficiency of the plant is when run at full load.																		
3	<p>BAT is to monitor key process parameters relevant for emissions to air and water including those given below.</p> <table border="1" data-bbox="322 778 1496 954"> <thead> <tr> <th data-bbox="322 778 689 810">Stream</th> <th data-bbox="689 778 1126 810">Parameter(s)</th> <th data-bbox="1126 778 1496 810">Monitoring</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 810 689 922" rowspan="3">Flue-gas</td> <td data-bbox="689 810 1126 842">Flow</td> <td data-bbox="1126 810 1496 842">Periodic or continuous determination</td> </tr> <tr> <td data-bbox="689 842 1126 890">Oxygen content, temperature, and pressure</td> <td data-bbox="1126 842 1496 890">Periodic or continuous measurement</td> </tr> <tr> <td data-bbox="689 890 1126 922">Water vapour content ⁽²⁾</td> <td data-bbox="1126 890 1496 922"></td> </tr> <tr> <td data-bbox="322 922 689 954">Waste water from flue-gas treatment</td> <td data-bbox="689 922 1126 954">Flow, pH, and temperature</td> <td data-bbox="1126 922 1496 954">Continuous measurement</td> </tr> </tbody> </table>	Stream	Parameter(s)	Monitoring	Flue-gas	Flow	Periodic or continuous determination	Oxygen content, temperature, and pressure	Periodic or continuous measurement	Water vapour content ⁽²⁾		Waste water from flue-gas treatment	Flow, pH, and temperature	Continuous measurement	CC	<p>The operator has confirmed the following:</p> <p>Continuous Emissions Monitoring will be in place monitoring Flow, Oxygen content, temperature and pressure.</p>					
Stream	Parameter(s)	Monitoring																			
Flue-gas	Flow	Periodic or continuous determination																			
	Oxygen content, temperature, and pressure	Periodic or continuous measurement																			
	Water vapour content ⁽²⁾																				
Waste water from flue-gas treatment	Flow, pH, and temperature	Continuous measurement																			
4	<p>BAT is to monitor emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</p> <table border="1" data-bbox="322 1050 1496 1375"> <thead> <tr> <th data-bbox="322 1050 477 1169">Substance/Parameter</th> <th data-bbox="477 1050 790 1169">Fuel/Process/Type of combustion plant</th> <th data-bbox="790 1050 947 1169">Combustion plant total rated thermal input</th> <th data-bbox="947 1050 1126 1169">Standard(s) ⁽⁴⁾</th> <th data-bbox="1126 1050 1350 1169">Minimum monitoring frequency ⁽⁵⁾</th> <th data-bbox="1350 1050 1496 1169">Monitoring associated with</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 1169 477 1241">NH₃</td> <td data-bbox="477 1169 790 1241">— When SCR and/or SNCR is used</td> <td data-bbox="790 1169 947 1241">All sizes</td> <td data-bbox="947 1169 1126 1241">Generic EN standards</td> <td data-bbox="1126 1169 1350 1241">Continuous ⁽⁶⁾ ⁽⁷⁾</td> <td data-bbox="1350 1169 1496 1241">BAT 7</td> </tr> <tr> <td data-bbox="322 1241 477 1375">NO_x</td> <td data-bbox="477 1241 790 1375">— Coal and/or lignite including waste co-incineration</td> <td data-bbox="790 1241 947 1375">All sizes</td> <td data-bbox="947 1241 1126 1375">Generic EN standards</td> <td data-bbox="1126 1241 1350 1375">Continuous ⁽⁶⁾ ⁽⁸⁾</td> <td data-bbox="1350 1241 1496 1375">BAT 20 BAT 24 BAT 28 BAT 32 BAT 37 BAT 41</td> </tr> </tbody> </table>	Substance/Parameter	Fuel/Process/Type of combustion plant	Combustion plant total rated thermal input	Standard(s) ⁽⁴⁾	Minimum monitoring frequency ⁽⁵⁾	Monitoring associated with	NH ₃	— When SCR and/or SNCR is used	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁷⁾	BAT 7	NO _x	— Coal and/or lignite including waste co-incineration	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁸⁾	BAT 20 BAT 24 BAT 28 BAT 32 BAT 37 BAT 41	FC	<p>The operator has confirmed that they will be in compliance with the requirements of BAT 4 by July 2021. Where specific monitoring standards are specified these have been included in the permit. Where generic standards are required then reference is made to Improvement Condition 6 (IC6), which requires submission of the monitoring standard that will be used by July 2021:</p>
Substance/Parameter	Fuel/Process/Type of combustion plant	Combustion plant total rated thermal input	Standard(s) ⁽⁴⁾	Minimum monitoring frequency ⁽⁵⁾	Monitoring associated with																
NH ₃	— When SCR and/or SNCR is used	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁷⁾	BAT 7																
NO _x	— Coal and/or lignite including waste co-incineration	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁸⁾	BAT 20 BAT 24 BAT 28 BAT 32 BAT 37 BAT 41																

BAT Concn. Number	Summary of BAT Conclusion requirement						Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		<ul style="list-style-type: none"> — Solid biomass and/or peat including waste co-incineration — HFO- and/or gas-oil-fired boilers and engines — Gas-oil-fired gas turbines — Natural-gas-fired boilers, engines, and turbines — Iron and steel process gases — Process fuels from the chemical industry — IGCC plants 				BAT 42 BAT 43 BAT 47 BAT 48 BAT 56 BAT 64 BAT 65 BAT 73	<p>The following parameters will be monitored at the frequency and standard specified.</p> <p>NH₃ – Continuous – IC6</p> <p>NO_x – Continuous – IC6</p> <p>N₂O – once per year – EN21258</p> <p>CO - Continuous – IC6</p> <p>SO₂ – Continuous – IC6</p> <p>HCl – Continuous – IC6</p> <p>HF – once per year– IC6</p> <p>Dust – Continuous – IC6</p> <p>Metals and Metalloids – Periodic (once per year) – EN14385</p> <p>Hg – Periodic (once per year) – EN 13211.</p> <p>We agree that the operator is in compliance with the monitoring requirements of this BAT conclusion.</p>	
	<ul style="list-style-type: none"> — Combustion plants on offshore platforms 	All sizes	EN 14792	Once every year ⁽⁹⁾	BAT 53			
N ₂ O	<ul style="list-style-type: none"> — Coal and/or lignite in circulating fluidised bed boilers — Solid biomass and/or peat in circulating fluidised bed boilers 	All sizes	EN 21258	Once every year ⁽¹⁰⁾	BAT 20 BAT 24			
CO	<ul style="list-style-type: none"> — Coal and/or lignite including waste co-incineration — Solid biomass and/or peat including waste co-incineration — HFO- and/or gas-oil-fired boilers and engines — Gas-oil-fired gas turbines — Natural-gas-fired boilers, engines, and turbines — Iron and steel process gases 	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁸⁾	BAT 20 BAT 24 BAT 28 BAT 33 BAT 38 BAT 44 BAT 49 BAT 56 BAT 64 BAT 65 BAT 73			

BAT Concn. Numbe r	Summary of BAT Conclusion requirement						Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		<ul style="list-style-type: none"> — Process fuels from the chemical industry — IGCC plants 						
		<ul style="list-style-type: none"> — Combustion plants on offshore platforms 	All sizes	EN 15058	Once every year ⁽⁹⁾	BAT 54		
	SO ₂	<ul style="list-style-type: none"> — Coal and/or lignite incl waste co-incineration — Solid biomass and/or peat incl waste co-incineration — HFO- and/or gas-oil-fired boilers — HFO- and/or gas-oil-fired engines — Gas-oil-fired gas turbines — Iron and steel process gases — Process fuels from the chemical industry in boilers — IGCC plants 	All sizes	Generic EN standards and EN 14791	Continuous ⁽⁶⁾ ⁽¹¹⁾ ⁽¹²⁾	BAT 21 BAT 25 BAT 29 BAT 34 BAT 39 BAT 50 BAT 57 BAT 66 BAT 67 BAT 74		
	SO ₃	<ul style="list-style-type: none"> — When SCR is used 	All sizes	No EN standard available	Once every year	—		
	Gaseous chlorides, expressed as HCl	<ul style="list-style-type: none"> — Coal and/or lignite — Process fuels from the chemical industry in boilers 	All sizes	EN 1911	Once every three months ⁽⁶⁾ ⁽¹³⁾ ⁽¹⁴⁾	BAT 21 BAT 57		
<ul style="list-style-type: none"> — Solid biomass and/or peat 		All sizes	Generic EN standards	Continuous ⁽¹⁵⁾ ⁽¹⁶⁾	BAT 25			
<ul style="list-style-type: none"> — Waste co-incineration 		All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽¹⁶⁾	BAT 66 BAT 67			
	HF	<ul style="list-style-type: none"> — Coal and/or lignite — Process fuels from the chemical industry in boilers 	All sizes	No EN standard available	Once every three months ⁽⁶⁾ ⁽¹³⁾ ⁽¹⁴⁾	BAT 21 BAT 57		

BAT Concn. Numbe r	Summary of BAT Conclusion requirement						Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		— Solid biomass and/or peat	All sizes	No EN standard available	Once every year	BAT 25		
		— Waste co-incineration	All sizes	Generic EN standards	Continuous ₍₆₎ ₍₁₆₎	BAT 66 BAT 67		
Dust		<ul style="list-style-type: none"> — Coal and/or lignite — Solid biomass and/or peat — HFO- and/or gas-oil-fired boilers — Iron and steel process gases — Process fuels from the chemical industry in boilers — IGCC plants — HFO- and/or gas-oil-fired engines — Gas-oil-fired gas turbines 	All sizes	Generic EN standards and EN 13284-1 and EN 13284-2	Continuous ₍₆₎ ₍₁₇₎	BAT 22 BAT 26 BAT 30 BAT 35 BAT 39 BAT 51 BAT 58 BAT 75		
		— Waste co-incineration	All sizes	Generic EN standards and EN 13284-2	Continuous	BAT 68 BAT 69		
Metals and metalloids except mercury (As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Tl, V, Zn)		<ul style="list-style-type: none"> — Coal and/or lignite — Solid biomass and/or peat — HFO- and/or gas-oil-fired boilers and engines 	All sizes	EN 14385	Once every year ₍₁₈₎	BAT 22 BAT 26 BAT 30		
		— Waste co-incineration	< 300 MW _{th}	EN 14385	Once every six months ₍₁₃₎	BAT 68 BAT 69		
			≥ 300 MW _{th}	EN 14385	Once every three months ₍₁₉₎ ₍₁₃₎			
		— IGCC plants	≥ 100 MW _{th}	EN 14385	Once every year ₍₁₈₎	BAT 75		
Hg		— Coal and/or lignite including waste co-incineration	< 300 MW _{th}	EN 13211	Once every three months ₍₁₃₎ ₍₂₀₎	BAT 23		
			≥ 300 MW _{th}	Generic EN standards and EN 14884	Continuous ₍₁₆₎ ₍₂₁₎			

BAT Concn. Number	Summary of BAT Conclusion requirement						Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		— Solid biomass and/or peat	All sizes	EN 13211	Once every year ⁽²²⁾	BAT 27		
		— Waste co-incineration with solid biomass and/or peat	All sizes	EN 13211	Once every three months ⁽¹³⁾	BAT 70		
		— IGCC plants	≥ 100 MW _{th}	EN 13211	Once every year ⁽²³⁾	BAT 75		
	TVOC	— HFO- and/or gas-oil-fired engines	All sizes	EN 12619	Once every six months ⁽¹³⁾	BAT 33 BAT 59		
		— Process fuels from chemical industry in boilers						
		— Waste co-incineration with coal, lignite, solid biomass and/or peat	All sizes	Generic EN standards	Continuous	BAT 71		
	Formaldehyde	— Natural-gas in spark-ignited lean-burn gas and dual fuel engines	All sizes	No EN standard available	Once every year	BAT 45		
	CH ₄	— Natural-gas-fired engines	All sizes	EN ISO 25139	Once every year ⁽²⁴⁾	BAT 45		
	PCDD/F	— Process fuels from chemical industry in boilers	All sizes	EN 1948-1, EN 1948-2, EN 1948-3	Once every six months ⁽¹³⁾ ⁽²⁵⁾	BAT 59 BAT 71		
		— Waste co-incineration						
5	BAT is to monitor emissions to water from flue-gas treatment with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.						NA	<p>The operator has confirmed the following:</p> <p>Flue gas treatment is a dry process, therefore, no waste water is generated from the process. This BAT conclusion is thus not applicable.</p>
	Substance/Parameter		Standard(s)		Minimum monitoring frequency	Monitoring associated with		
	Total organic carbon (TOC) ⁽²⁶⁾		EN 1484		Once every month	BAT 15		
	Chemical oxygen demand (COD) ⁽²⁶⁾		No EN standard available					
	Total suspended solids (TSS)		EN 872					
	Fluoride (F ⁻)		EN ISO 10304-1					

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																																		
	<table border="1"> <tr> <td colspan="2">Sulphate (SO₄²⁻)</td> <td>EN ISO 10304-1</td> <td></td> </tr> <tr> <td colspan="2">Sulphide, easily released (S²⁻)</td> <td>No EN standard available</td> <td></td> </tr> <tr> <td colspan="2">Sulphite (SO₃²⁻)</td> <td>EN ISO 10304-3</td> <td></td> </tr> <tr> <td rowspan="7">Metals and metalloids</td> <td>As</td> <td rowspan="7">Various EN standards available (e.g. EN ISO 11885 or EN ISO 17294-2)</td> <td></td> </tr> <tr> <td>Cd</td> </tr> <tr> <td>Cr</td> </tr> <tr> <td>Cu</td> </tr> <tr> <td>Ni</td> </tr> <tr> <td>Pb</td> </tr> <tr> <td>Zn</td> </tr> <tr> <td></td> <td>Hg</td> <td>Various EN standards available (e.g. EN ISO 12846 or EN ISO 17852)</td> <td></td> </tr> <tr> <td colspan="2">Chloride (Cl⁻)</td> <td>Various EN standards available (e.g. EN ISO 10304-1 or EN ISO 15682)</td> <td>—</td> </tr> <tr> <td colspan="2">Total nitrogen</td> <td>EN 12260</td> <td>—</td> </tr> </table>	Sulphate (SO ₄ ²⁻)		EN ISO 10304-1		Sulphide, easily released (S ²⁻)		No EN standard available		Sulphite (SO ₃ ²⁻)		EN ISO 10304-3		Metals and metalloids	As	Various EN standards available (e.g. EN ISO 11885 or EN ISO 17294-2)		Cd	Cr	Cu	Ni	Pb	Zn		Hg	Various EN standards available (e.g. EN ISO 12846 or EN ISO 17852)		Chloride (Cl ⁻)		Various EN standards available (e.g. EN ISO 10304-1 or EN ISO 15682)	—	Total nitrogen		EN 12260	—		
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Total nitrogen		EN 12260	—																																		
6	<p>In order to improve the general environmental performance of combustion plants and to reduce emissions to air of CO and unburnt substances, BAT is to ensure optimised combustion and to use an appropriate combination of the techniques given below.</p> <table border="1"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td>a. Fuel blending and mixing</td> <td>Ensure stable combustion conditions and/or reduce the emission of pollutants by mixing different qualities of the same fuel type</td> <td rowspan="2">Generally applicable</td> </tr> <tr> <td>b. Maintenance of the combustion system</td> <td>Regular planned maintenance according to suppliers' recommendations</td> </tr> <tr> <td>c. Advanced control system</td> <td>See description in Section 8.1</td> <td>The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system</td> </tr> <tr> <td>d. Good design of the combustion equipment</td> <td>Good design of furnace, combustion chambers, burners and associated devices</td> <td>Generally applicable to new combustion plants</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Fuel blending and mixing	Ensure stable combustion conditions and/or reduce the emission of pollutants by mixing different qualities of the same fuel type	Generally applicable	b. Maintenance of the combustion system	Regular planned maintenance according to suppliers' recommendations	c. Advanced control system	See description in Section 8.1	The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system	d. Good design of the combustion equipment	Good design of furnace, combustion chambers, burners and associated devices	Generally applicable to new combustion plants	CC	<p>The operator has confirmed the following:</p> <p>That they are compliant with the requirements through a combination of techniques as set out below:</p> <p>a) Fuel blending and mixing – The plant burns wood pellets and wood chips. All of the material is derived from virgin biomass. Therefore, there is a consistent and predictable fuel mix.</p> <p>b) Maintenance of the combustion system – Regular planned</p>																				
Technique	Description	Applicability																																			
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e.	Fuel choice	Select or switch totally or partially to another fuel(s) with a better environmental profile (e.g. with low sulphur and/or mercury content) amongst the available fuels, including in start-up situations or when back-up fuels are used	Applicable within the constraints associated with the availability of suitable types of fuel with a better environmental profile as a whole, which may be impacted by the energy policy of the Member State, or by the integrated site's fuel balance in the case of combustion of industrial process fuels. For existing combustion plants, the type of fuel chosen may be limited by the configuration and the design of the plant				
7	<p>In order to reduce emissions of ammonia to air from the use of selective catalytic reduction (SCR) and/or selective non-catalytic reduction (SNCR) for the abatement of NO_x emissions, BAT is to optimise the design and/or operation of SCR and/or SNCR (e.g. optimised reagent to NO_x ratio, homogeneous reagent distribution and optimum size of the reagent drops).</p> <p>BAT-associated emission levels</p> <p>The BAT-associated emission level (BAT-AEL) for emissions of NH₃ to air from the use of SCR and/or SNCR is < 3–10 mg/Nm³ as a yearly average or average over the sampling period. The lower end of the range can be achieved when using SCR and the upper end of the range can be achieved when using SNCR without wet abatement techniques. In the case of plants combusting biomass and operating at variable loads as well as in the case of engines combusting HFO and/or gas oil, the higher end of the BAT-AEL range is 15 mg/Nm³.</p>	CC	<p>The operator has confirmed the following:</p> <p>SNCR will be installed at the plant to abate emissions of NO_x, whilst minimising NH₃ slip. The system will be designed and optimised in accordance with information submitted to discharge preoperational condition 6 and 13.</p>				
8	<p>In order to prevent or reduce emissions to air during normal operating conditions, BAT is to ensure, by appropriate design, operation and maintenance, that the emission abatement systems are used at optimal capacity and availability.</p>	CC	<p>The design operational and maintenance of abatement equipment is detailed in information submitted in response to preoperational condition 6.</p>				

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement															
9	<p>In order to improve the general environmental performance of combustion and/or gasification plants and to reduce emissions to air, BAT is to include the following elements in the quality assurance/quality control programmes for all the fuels used, as part of the environmental management system (see BAT 1):</p> <ul style="list-style-type: none"> (i) Initial full characterisation of the fuel used including at least the parameters listed below and in accordance with EN standards. ISO, national or other international standards may be used provided they ensure the provision of data of an equivalent scientific quality; (ii) Regular testing of the fuel quality to check that it is consistent with the initial characterisation and according to the plant design specifications. The frequency of testing and the parameters chosen from the table below are based on the variability of the fuel and an assessment of the relevance of pollutant releases (e.g. concentration in fuel, flue-gas treatment employed); (iii) Subsequent adjustment of the plant settings as and when needed and practicable (e.g. integration of the fuel characterisation and control in the advanced control system (see description in Section 8.1)). <p>Description Initial characterisation and regular testing of the fuel can be performed by the operator and/or the fuel supplier. If performed by the supplier, the full results are provided to the operator in the form of a product (fuel) supplier specification and/or guarantee.</p> <table border="1" data-bbox="322 836 1491 1372"> <thead> <tr> <th data-bbox="322 836 712 871">Fuel(s)</th> <th data-bbox="712 836 1491 871">Substances/Parameters subject to characterisation</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 871 712 1075" rowspan="4">Biomass/peat</td> <td data-bbox="712 871 1491 911">— LHV</td> </tr> <tr> <td data-bbox="712 911 1491 951">— moisture</td> </tr> <tr> <td data-bbox="712 951 1491 991">— Ash</td> </tr> <tr> <td data-bbox="712 991 1491 1075">— C, Cl, F, N, S, K, Na — Metals and metalloids (As, Cd, Cr, Cu, Hg, Pb, Zn)</td> </tr> <tr> <td data-bbox="322 1075 712 1289" rowspan="4">Coal/lignite</td> <td data-bbox="712 1075 1491 1115">— LHV</td> </tr> <tr> <td data-bbox="712 1115 1491 1155">— Moisture</td> </tr> <tr> <td data-bbox="712 1155 1491 1195">— Volatiles, ash, fixed carbon, C, H, N, O, S</td> </tr> <tr> <td data-bbox="712 1195 1491 1235">— Br, Cl, F</td> </tr> <tr> <td data-bbox="322 1289 712 1372" rowspan="2">HFO</td> <td data-bbox="712 1289 1491 1329">— Ash</td> </tr> <tr> <td data-bbox="712 1329 1491 1372">— C, S, N, Ni, V</td> </tr> </tbody> </table>	Fuel(s)	Substances/Parameters subject to characterisation	Biomass/peat	— LHV	— moisture	— Ash	— C, Cl, F, N, S, K, Na — Metals and metalloids (As, Cd, Cr, Cu, Hg, Pb, Zn)	Coal/lignite	— LHV	— Moisture	— Volatiles, ash, fixed carbon, C, H, N, O, S	— Br, Cl, F	HFO	— Ash	— C, S, N, Ni, V	FC	<p>The operator has confirmed the following:</p> <p>A Fuel Quality Management System will be in place for the managing and controlling of the mixture of fuel supplied to keep it within the limits of the contract.</p> <p>Samples of the fuel will be taken and sent to a laboratory for analysis. In the event that the sample do not meet contracted levels then sampling would be take every 4 hours until the samples are within expected parameters.</p> <p>Improvement Condition 4 has been included in the permit requiring that a report is submitted demonstrating compliance with the BAT conclusion.</p>
Fuel(s)	Substances/Parameters subject to characterisation																	
Biomass/peat	— LHV																	
	— moisture																	
	— Ash																	
	— C, Cl, F, N, S, K, Na — Metals and metalloids (As, Cd, Cr, Cu, Hg, Pb, Zn)																	
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HFO	— Ash																	
	— C, S, N, Ni, V																	

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Gas oil	<ul style="list-style-type: none"> — Ash — N, C, S 												
Natural gas	<ul style="list-style-type: none"> — LHV — CH₄, C₂H₆, C₃, C₄+, CO₂, N₂, Wobbe index 												
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Waste ⁽²⁸⁾	<ul style="list-style-type: none"> — LHV — Moisture — Volatiles, ash, Br, C, Cl, F, H, N, O, S — Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Tl, V, Zn) 												
10	<p>In order to reduce emissions to air and/or to water during other than normal operating conditions (OTNOC), BAT is to set up and implement a management plan as part of the environmental management system (see BAT 1), commensurate with the relevance of potential pollutant releases, that includes the following elements:</p> <ul style="list-style-type: none"> — appropriate design of the systems considered relevant in causing OTNOC that may have an impact on emissions to air, water and/or soil (e.g. low-load design concepts for reducing the minimum start-up and shutdown loads for stable generation in gas turbines), — set-up and implementation of a specific preventive maintenance plan for these relevant systems, — review and recording of emissions caused by OTNOC and associated circumstances and implementation of corrective actions if necessary, — periodic assessment of the overall emissions during OTNOC (e.g. frequency of events, duration, emissions quantification/estimation) and implementation of corrective actions if necessary. 	FC	<p>The operator has confirmed the following:</p> <p>A site specific Environment Management System (EMS) is not yet in place. Preoperational Condition 4 has been updated to require that OTNOC are incorporated into the EMS.</p>										
11	<p>BAT is to appropriately monitor emissions to air and/or to water during OTNOC.</p> <p>Description</p> <p>The monitoring can be carried out by direct measurement of emissions or by monitoring of surrogate parameters if this proves to be of equal or better scientific quality than the direct measurement of emissions. Emissions during start-up and shutdown (SU/SD) may be assessed based on a detailed emission measurement carried out</p>	CC	<p>The operator has confirmed the following:</p> <p>Continuous Emissions Monitoring will be in place at the plant.</p>										

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																								
	for a typical SU/SD procedure at least once every year, and using the results of this measurement to estimate the emissions for each and every SU/SD throughout the year.		Emissions will be monitored during OTNOC.																								
12	<p>In order to increase the energy efficiency of combustion, gasification and/or IGCC units operated $\geq 1\,500$ h/yr, BAT is to use an appropriate combination of the techniques given below.</p> <table border="1" data-bbox="322 512 1496 1337"> <thead> <tr> <th data-bbox="322 512 577 544">Technique</th> <th data-bbox="577 512 1057 544">Description</th> <th data-bbox="1057 512 1496 544">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 544 367 655">a. Combustion optimisation</td> <td data-bbox="577 544 1057 655">See description in Section 8.2. Optimising the combustion minimises the content of unburnt substances in the flue-gases and in solid combustion residues</td> <td data-bbox="1057 544 1496 655" rowspan="3">Generally applicable</td> </tr> <tr> <td data-bbox="322 655 367 791">b. Optimisation of the working medium conditions</td> <td data-bbox="577 655 1057 791">Operate at the highest possible pressure and temperature of the working medium gas or steam, within the constraints associated with, for example, the control of NO_x emissions or the characteristics of energy demanded</td> </tr> <tr> <td data-bbox="322 791 367 895">c. Optimisation of the steam cycle</td> <td data-bbox="577 791 1057 895">Operate with lower turbine exhaust pressure by utilisation of the lowest possible temperature of the condenser cooling water, within the design conditions</td> </tr> <tr> <td data-bbox="322 895 367 959">d. Minimisation of energy consumption</td> <td data-bbox="577 895 1057 959">Minimising the internal energy consumption (e.g. greater efficiency of the feed-water pump)</td> <td data-bbox="1057 959 1496 1038" rowspan="2">Generally applicable within the constraints related to the need to control NO_x emissions</td> </tr> <tr> <td data-bbox="322 959 367 1038">e. Preheating of combustion air</td> <td data-bbox="577 959 1057 1038">Reuse of part of the heat recovered from the combustion flue-gas to preheat the air used in combustion</td> </tr> <tr> <td data-bbox="322 1038 367 1126">f. Fuel preheating</td> <td data-bbox="577 1038 1057 1126">Preheating of fuel using recovered heat</td> <td data-bbox="1057 1126 1496 1230">Generally applicable within the constraints associated with the boiler design and the need to control NO_xemissions</td> </tr> <tr> <td data-bbox="322 1230 367 1337">g. Advanced control system</td> <td data-bbox="577 1230 1057 1337">See description in Section 8.2. Computerised control of the main combustion parameters enables the combustion efficiency to be improved</td> <td data-bbox="1057 1230 1496 1337">Generally applicable to new units. The applicability to old units may be constrained by the need to retrofit the combustion system and/or control command system</td> </tr> <tr> <td data-bbox="322 1337 367 1342">h. Feed-water preheating using recovered heat</td> <td data-bbox="577 1337 1057 1342">Preheat water coming out of the steam condenser with recovered heat, before reusing it in the boiler</td> <td data-bbox="1057 1337 1496 1342">Only applicable to steam circuits and not to hot boilers. Applicability to existing units may be limited due to constraints associated with the plant</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Combustion optimisation	See description in Section 8.2. Optimising the combustion minimises the content of unburnt substances in the flue-gases and in solid combustion residues	Generally applicable	b. Optimisation of the working medium conditions	Operate at the highest possible pressure and temperature of the working medium gas or steam, within the constraints associated with, for example, the control of NO _x emissions or the characteristics of energy demanded	c. 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Flue gas is monitored to ensure complete combustion of fuel.</p> <p>e) Preheating of combustion air – Combustion air is pre-heated through a Rotary Air Pre-Heater, Condensate and Feedwater heating and a flue gas Heat Recovery Unit.</p> <p>g) Advanced Control System – The Tees REP Distributed Control System (DCS) will control combustion efficiency. The objective of this is to achieve high boiler performance with optimised combustion conditions. This will be achieved by monitoring a range of parameters. As a minimum this will include steam flow, steam temperature, steam pressure, bed temperature and</p>
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BAT Concn. Number	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
				configuration and the amount of recoverable heat	flue gas temperature profile within CFB boiler.
	i.	Heat recovery by cogeneration (CHP)	Recovery of heat (mainly from the steam system) for producing hot water/steam to be used in industrial processes/activities or in a public network for district heating. Additional heat recovery is possible from: — flue-gas — grate cooling — circulating fluidised bed	Applicable within the constraints associated with the local heat and power demand. The applicability may be limited in the case of gas compressors with an unpredictable operational heat profile	h) Feed-water preheating using recovered heat – A reheat system is included on the Steam turbine which extracts steam from the High Pressure section of the turbine and recovers further heat in the CFB boiler before re-entering the Intermediate Pressure section of the turbine at a higher temperature.
	j.	CHP readiness	See description in Section 8.2.	Only applicable to new units where there is a realistic potential for the future use of heat in the vicinity of the unit	j) CHP readiness – The installation is CHP ready.
	k.	Flue-gas condenser	See description in Section 8.2.	Generally applicable to CHP units provided there is enough demand for low-temperature heat	o) Fuel pre-drying – The primary fuel for the installation will be wood pellets, which have a low moisture content. The site can also burn wood chip, which has a higher moisture content. It has the ability to dry out the wood chip if required.
	l.	Heat accumulation	Heat accumulation storage in CHP mode	Only applicable to CHP plants. The applicability may be limited in the case of low heat load demand	p) Minimisation of heat losses – A heat recovery system will be installed. This includes the transfer of air to the primary and secondary combustion systems.
	m.	Wet stack	See description in Section 8.2.	Generally applicable to new and existing units fitted with wet FGD	
	n.	Cooling tower discharge	The release of emissions to air through a cooling tower and not via a dedicated stack	Only applicable to units fitted with wet FGD where reheating of the flue-gas is necessary before release, and where the unit cooling system is a cooling tower	
	o.	Fuel pre-drying	The reduction of fuel moisture content before combustion to improve combustion conditions	Applicable to the combustion of biomass and/or peat within the constraints associated with spontaneous combustion risks (e.g. the moisture content of peat is kept above 40 % throughout the delivery chain). The retrofit of existing plants may be restricted by the extra calorific value that can be obtained from the drying operation and by the limited retrofit possibilities offered by some boiler designs or plant configurations	

BAT Concn. Number	Summary of BAT Conclusion requirement				Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	p.	Minimisation of heat losses	Minimising residual heat losses, e.g. those that occur via the slag or those that can be reduced by insulating radiating sources	Only applicable to solid-fuel-fired combustion units and to gasification/IGCC units		
	q.	Advanced materials	Use of advanced materials proven to be capable of withstanding high operating temperatures and pressures and thus to achieve increased steam/combustion process efficiencies	Only applicable to new plants		
	r.	Steam turbine upgrades	This includes techniques such as increasing the temperature and pressure of medium-pressure steam, addition of a low-pressure turbine, and modifications to the geometry of the turbine rotor blades	The applicability may be restricted by demand, steam conditions and/or limited plant lifetime		
	s.	Supercritical and ultra-supercritical steam conditions	Use of a steam circuit, including steam reheating systems, in which steam can reach pressures above 220,6 bar and temperatures above 374 °C in the case of supercritical conditions, and above 250 – 300 bar and temperatures above 580 – 600 °C in the case of ultra-supercritical conditions	Only applicable to new units of $\geq 600 \text{ MW}_{\text{th}}$ operated $> 4\,000 \text{ h/yr}$. Not applicable when the purpose of the unit is to produce low steam temperatures and/or pressures in process industries. Not applicable to gas turbines and engines generating steam in CHP mode. For units combusting biomass, the applicability may be constrained by high-temperature corrosion in the case of certain biomasses		
13	In order to reduce water usage and the volume of contaminated waste water discharged, BAT is to use one or both of the techniques given below.				CC	The operator has confirmed the following: All industrial waters collected from the water/steam processes (e.g. boiler blow-down) are recycled in the combined fire water/raw water tank.
	Technique	Description	Applicability			
a.	Water recycling	Residual aqueous streams, including run-off water, from the plant are reused for other purposes. The degree of recycling is limited by the quality requirements of the recipient water stream and the water balance of the plant	Not applicable to waste water from cooling systems when water treatment chemicals and/or high concentrations of salts from seawater are present			
b.	Dry bottom ash handling	Dry, hot bottom ash falls from the furnace onto a mechanical conveyor system and is cooled down by ambient air. No water is used in the process.	Only applicable to plants combusting solid fuels. There may be technical restrictions that prevent retrofitting to existing combustion plants			

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																														
14	<p>In order to prevent the contamination of uncontaminated waste water and to reduce emissions to water, BAT is to segregate waste water streams and to treat them separately, depending on the pollutant content.</p> <p>Description Waste water streams that are typically segregated and treated include surface run-off water, cooling water, and waste water from flue-gas treatment.</p> <p>Applicability The applicability may be restricted in the case of existing plants due to the configuration of the drainage systems.</p>	CC	<p>The operator has confirmed the following:</p> <p>A drainage system is in place which collects and segregates water according to its source and content. Contaminated water is sent to the Waste Water Treatment Plant.</p>																														
15	<p>In order to reduce emissions to water from flue-gas treatment, BAT is to use an appropriate combination of the techniques given below, and to use secondary techniques as close as possible to the source in order to avoid dilution.</p> <table border="1" data-bbox="322 735 1494 1356"> <thead> <tr> <th data-bbox="322 735 712 794">Technique</th> <th data-bbox="712 735 1025 794">Typical pollutants prevented/abated</th> <th data-bbox="1025 735 1494 794">Applicability</th> </tr> </thead> <tbody> <tr> <td colspan="3" data-bbox="322 794 1494 831" style="text-align: center;">Primary techniques</td> </tr> <tr> <td data-bbox="322 831 712 916">a.</td> <td data-bbox="712 831 1025 916">Optimised combustion (see BAT 6) and flue-gas treatment systems (e.g. SCR/SNCR, see BAT 7) Organic compounds, ammonia (NH₃)</td> <td data-bbox="1025 831 1494 916">Generally applicable</td> </tr> <tr> <td colspan="3" data-bbox="322 916 1494 952" style="text-align: center;">Secondary techniques ⁽²⁹⁾</td> </tr> <tr> <td data-bbox="322 952 712 1011">b.</td> <td data-bbox="712 952 1025 1011">Adsorption on activated carbon Organic compounds, mercury (Hg)</td> <td data-bbox="1025 952 1494 1011">Generally applicable</td> </tr> <tr> <td data-bbox="322 1011 712 1145">c.</td> <td data-bbox="712 1011 1025 1145">Aerobic biological treatment Biodegradable organic compounds, ammonium (NH₄⁺)</td> <td data-bbox="1025 1011 1494 1145">Generally applicable for the treatment of organic compounds. Aerobic biological treatment of ammonium (NH₄⁺) may not be applicable in the case of high chloride concentrations (i.e. around 10 g/l)</td> </tr> <tr> <td data-bbox="322 1145 712 1204">d.</td> <td data-bbox="712 1145 1025 1204">Anoxic/anaerobic biological treatment Mercury (Hg), nitrate (NO₃⁻), nitrite (NO₂⁻)</td> <td data-bbox="1025 1145 1494 1204">Generally applicable</td> </tr> <tr> <td data-bbox="322 1204 712 1241">e.</td> <td data-bbox="712 1204 1025 1241">Coagulation and flocculation Suspended solids</td> <td data-bbox="1025 1204 1494 1241">Generally applicable</td> </tr> <tr> <td data-bbox="322 1241 712 1300">f.</td> <td data-bbox="712 1241 1025 1300">Crystallisation Metals and metalloids, sulphate (SO₄²⁻), fluoride (F⁻)</td> <td data-bbox="1025 1241 1494 1300">Generally applicable</td> </tr> <tr> <td data-bbox="322 1300 712 1356">g.</td> <td data-bbox="712 1300 1025 1356">Filtration (e.g. sand filtration, microfiltration, ultrafiltration) Suspended solids, metals</td> <td data-bbox="1025 1300 1494 1356">Generally applicable</td> </tr> </tbody> </table>	Technique	Typical pollutants prevented/abated	Applicability	Primary techniques			a.	Optimised combustion (see BAT 6) and flue-gas treatment systems (e.g. SCR/SNCR, see BAT 7) Organic compounds, ammonia (NH ₃)	Generally applicable	Secondary techniques ⁽²⁹⁾			b.	Adsorption on activated carbon Organic compounds, mercury (Hg)	Generally applicable	c.	Aerobic biological treatment Biodegradable organic compounds, ammonium (NH ₄ ⁺)	Generally applicable for the treatment of organic compounds. Aerobic biological treatment of ammonium (NH ₄ ⁺) may not be applicable in the case of high chloride concentrations (i.e. around 10 g/l)	d.	Anoxic/anaerobic biological treatment Mercury (Hg), nitrate (NO ₃ ⁻), nitrite (NO ₂ ⁻)	Generally applicable	e.	Coagulation and flocculation Suspended solids	Generally applicable	f.	Crystallisation Metals and metalloids, sulphate (SO ₄ ²⁻), fluoride (F ⁻)	Generally applicable	g.	Filtration (e.g. sand filtration, microfiltration, ultrafiltration) Suspended solids, metals	Generally applicable	CC	<p>The operator has confirmed the following:</p> <p>Flue gas treatment is a dry process, therefore, no waste water is generated from the process. This BAT conclusion is thus not applicable.</p>
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	h.	Flotation	Suspended solids, free oil	Generally applicable		
	i.	Ion exchange	Metals	Generally applicable		
	j.	Neutralisation	Acids, alkalis	Generally applicable		
	k.	Oxidation	Sulphide (S ²⁻), sulphite (SO ₃ ²⁻)	Generally applicable		
	l.	Precipitation	Metals and metalloids, sulphate (SO ₄ ²⁻), fluoride (F ⁻)	Generally applicable		
	m.	Sedimentation	Suspended solids	Generally applicable		
	n.	Stripping	Ammonia (NH ₃)	Generally applicable		
	The BAT-AELs refer to direct discharges to a receiving water body at the point where the emission leaves the installation.					
	BAT-AELs for direct discharges to a receiving water body from flue-gas treatment					
	Substance/Parameter			BAT-AELs		
				Daily average		
	Total organic carbon (TOC)			20–50 mg/l ⁽³⁰⁾ ⁽³¹⁾ ⁽³²⁾		
	Chemical oxygen demand (COD)			60–150 mg/l ⁽³⁰⁾ ⁽³¹⁾ ⁽³²⁾		
	Total suspended solids (TSS)			10–30 mg/l		
	Fluoride (F ⁻)			10–25 mg/l ⁽³²⁾		
	Sulphate (SO ₄ ²⁻)			1,3–2,0 g/l ⁽³²⁾ ⁽³³⁾ ⁽³⁴⁾ ⁽³⁵⁾		
	Sulphide (S ²⁻), easily released			0,1–0,2 mg/l ⁽³²⁾		
	Sulphite (SO ₃ ²⁻)			1–20 mg/l ⁽³²⁾		
	Metals and metalloids			As	10–50 µg/l	
				Cd	2–5 µg/l	
				Cr	10–50 µg/l	
				Cu	10–50 µg/l	
				Hg	0,2–3 µg/l	
				Ni	10–50 µg/l	
				Pb	10–20 µg/l	
				Zn	50–200 µg/l	

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement															
16	<p>In order to reduce the quantity of waste sent for disposal from the combustion and/or gasification process and abatement techniques, BAT is to organise operations so as to maximise, in order of priority and taking into account life-cycle thinking:</p> <p>(a) waste prevention, e.g. maximise the proportion of residues which arise as by-products;</p> <p>(b) waste preparation for reuse, e.g. according to the specific requested quality criteria;</p> <p>(c) waste recycling;</p> <p>(d) other waste recovery (e.g. energy recovery),</p> <p>by implementing an appropriate combination of techniques such as:</p> <table border="1" data-bbox="322 655 1491 1246"> <thead> <tr> <th data-bbox="322 655 573 687">Technique</th> <th data-bbox="573 655 1081 687">Description</th> <th data-bbox="1081 655 1491 687">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 687 573 847">a. 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Energy recovery by using waste in the fuel mix</td> <td data-bbox="573 983 1081 1094">The residual energy content of carbon-rich ash and sludges generated by the combustion of coal, lignite, heavy fuel oil, peat or biomass can be recovered for example by mixing with the fuel</td> <td data-bbox="1081 983 1491 1094">Generally applicable where plants can accept waste in the fuel mix and are technically able to feed the fuels into the combustion chamber</td> </tr> <tr> <td data-bbox="322 1094 573 1246">d. Preparation of spent catalyst for reuse</td> <td data-bbox="573 1094 1081 1246">Preparation of catalyst for reuse (e.g. up to four times for SCR catalysts) restores some or all of the original performance, extending the service life of the catalyst to several decades. 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Technique	Description	Applicability																
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17	<p>In order to reduce noise emissions, BAT is to use one or a combination of the techniques given below.</p> <table border="1" data-bbox="322 1294 1491 1361"> <thead> <tr> <th data-bbox="322 1294 584 1326">Technique</th> <th data-bbox="584 1294 1081 1326">Description</th> <th data-bbox="1081 1294 1491 1326">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 1326 584 1361">a. Operational measures</td> <td data-bbox="584 1326 1081 1361">These include:</td> <td data-bbox="1081 1326 1491 1361">Generally applicable</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Operational measures	These include:	Generally applicable	CC	<p>The operator has confirmed the following:</p>									
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BAT Concn. Number	Summary of BAT Conclusion requirement				Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		<ul style="list-style-type: none"> — improved inspection and maintenance of equipment — closing of doors and windows of enclosed areas, if possible — equipment operated by experienced staff — avoidance of noisy activities at night, if possible — provisions for noise control during maintenance activities 			<p>Noise emissions will be monitored following the commencement of operations.</p> <p>A – A series of operational measure will be put in place in order to control noise emissions. This will include the inspection and maintenance of equipment, closing of doors and windows in enclosed areas, noisy activities will be avoided at night and equipment will be operated by experienced staff.</p>	
	b. Low-noise equipment	This potentially includes compressors, pumps and disks	Generally applicable when the equipment is new or replaced			
	c. Noise attenuation	Noise propagation can be reduced by inserting obstacles between the emitter and the receiver. Appropriate obstacles include protection walls, embankments and buildings	Generally applicable to new plants. In the case of existing plants, the insertion of obstacles may be restricted by lack of space			
	d. Noise-control equipment	This includes: <ul style="list-style-type: none"> — noise-reducers — equipment insulation — enclosure of noisy equipment — soundproofing of buildings 	The applicability may be restricted by lack of space			
	e. Appropriate location of equipment and buildings	Noise levels can be reduced by increasing the distance between the emitter and the receiver and by using buildings as noise screens	Generally applicable to new plant			
Combustion of solid fuels only						
2.2.1 Table 8	BAT-associated energy efficiency levels (BAT-AEELs) for the combustion of solid biomass and/or peat			FC	An improvement condition (IC5) has been included in the permit requiring that the operator provides the net electrical efficiency % for the plant.	
Type of combustion unit	BAT-AEELs ⁽⁷³⁾ ⁽⁷⁴⁾					
	Net electrical efficiency (%) ⁽⁷⁵⁾		Net total fuel utilisation (%) ⁽⁷⁶⁾ ⁽⁷⁷⁾			
	New unit ⁽⁷⁸⁾	Existing unit	New unit			Existing unit

BAT Concn. Number	Summary of BAT Conclusion requirement					Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	Solid biomass and/or peat boiler	33,5–to > 38	28–38	73–99	73–99		
24	In order to prevent or reduce NO _x emissions to air while limiting CO and N ₂ O emissions to air from the combustion of solid biomass and/or peat, BAT is to use one or a combination of the techniques given below.					CC	<p>The operator has confirmed that the following measures will be in place:</p> <p>a) Combustion optimisation – The combustion process will be monitored and operated in accordance with the plan design parameters. Flue gas is monitored to ensure complete combustion of fuel.</p> <p>e) Flue-gas recirculation- Flue gases are recirculated into the main combustion chamber.</p> <p>f) Selective non-catalytic reduction (SNCR) – Feeding locations of ammonia water solution are at four different levels in the separators and two levels in the furnace. The system is also fitted with 'slip' SCR.</p>
Technique			Description		Applicability		
a.	Combustion optimisation	See descriptions in Section 8.3		Generally applicable			
b.	Low-NO _x burners (LNB)						
c.	Air staging						
d.	Fuel staging						
e.	Flue-gas recirculation	See description in Section 8.3. Can be applied with 'slip' SCR		Not applicable to combustion plants operated < 500 h/yr with highly variable boiler loads. The applicability may be limited in the case of combustion plants operated between 500 h/yr and 1 500 h/yr with highly variable boiler loads. For existing combustion plants, applicable within the constraints associated with the required temperature window and residence time for the injected reactants			
f.	Selective non-catalytic reduction (SNCR)						
g.	Selective catalytic reduction (SCR)	See description in Section 8.3. The use of high-alkali fuels (e.g. straw) may require the SCR to be installed downstream of the dust abatement system		Not applicable to combustion plants operated < 500 h/yr. There may be economic restrictions for retrofitting existing combustion plants of < 300 MW _{th} . Not generally applicable to existing combustion plants of < 100 MW _{th}			
BAT-associated emission levels (BAT-AELs) for NO_x emissions to air from the combustion of solid biomass and/or peat							
					BAT-AELs (mg/Nm³)		

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																								
	<table border="1" data-bbox="320 384 1494 657"> <thead> <tr> <th rowspan="2">Combustion plant total rated thermal input (MW_{th})</th> <th colspan="2">Yearly average</th> <th colspan="2">Daily average or average over the sampling period</th> </tr> <tr> <th>New plant</th> <th>Existing plant ⁽⁷⁹⁾</th> <th>New plant</th> <th>Existing plant ⁽⁸⁰⁾</th> </tr> </thead> <tbody> <tr> <td>50–100</td> <td>70–150 ⁽⁸¹⁾</td> <td>70–225 ⁽⁸²⁾</td> <td>120–200 ⁽⁸³⁾</td> <td>120–275 ⁽⁸⁴⁾</td> </tr> <tr> <td>100–300</td> <td>50–140</td> <td>50–180</td> <td>100–200</td> <td>100–220</td> </tr> <tr> <td>≥ 300</td> <td>40–140</td> <td>40–150 ⁽⁸⁵⁾</td> <td>65–150</td> <td>95–165 ⁽⁸⁶⁾</td> </tr> </tbody> </table> <p data-bbox="320 662 1494 890">As an indication, the yearly average CO emission levels will generally be:</p> <ul data-bbox="320 694 1494 890" style="list-style-type: none"> — < 30–250 mg/Nm³ for existing combustion plants of 50–100 MW_{th} operated ≥ 1 500 h/yr, or new combustion plants of 50–100 MW_{th}, — < 30–160 mg/Nm³ for existing combustion plants of 100–300 MW_{th} operated ≥ 1 500 h/yr, or new combustion plants of 100–300 MW_{th}, — < 30–80 mg/Nm³ for existing combustion plants of ≥ 300 MW_{th} operated ≥ 1 500 h/yr, or new combustion plants of ≥ 300 MW_{th}. 	Combustion plant total rated thermal input (MW _{th})	Yearly average		Daily average or average over the sampling period		New plant	Existing plant ⁽⁷⁹⁾	New plant	Existing plant ⁽⁸⁰⁾	50–100	70–150 ⁽⁸¹⁾	70–225 ⁽⁸²⁾	120–200 ⁽⁸³⁾	120–275 ⁽⁸⁴⁾	100–300	50–140	50–180	100–200	100–220	≥ 300	40–140	40–150 ⁽⁸⁵⁾	65–150	95–165 ⁽⁸⁶⁾		
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25	<p data-bbox="320 906 1494 962">In order to prevent or reduce SO_x, HCl and HF emissions to air from the combustion of solid biomass and/or peat, BAT is to use one or a combination of the techniques given below.</p> <table border="1" data-bbox="320 962 1494 1337"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td>a. Boiler sorbent injection (in-furnace or in-bed)</td> <td rowspan="6">See descriptions in Section 8.4</td> <td rowspan="6">Generally applicable</td> </tr> <tr> <td>b. Duct sorbent injection (DSI)</td> </tr> <tr> <td>c. Spray dry absorber (SDA)</td> </tr> <tr> <td>d. Circulating fluidised bed (CFB) dry scrubber</td> </tr> <tr> <td>e. Wet scrubbing</td> </tr> <tr> <td>f. Flue-gas condenser</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Boiler sorbent injection (in-furnace or in-bed)	See descriptions in Section 8.4	Generally applicable	b. Duct sorbent injection (DSI)	c. Spray dry absorber (SDA)	d. Circulating fluidised bed (CFB) dry scrubber	e. Wet scrubbing	f. Flue-gas condenser	CC	<p data-bbox="1653 906 2020 991">The operator has confirmed that the following techniques will be in place:</p> <p data-bbox="1653 1018 2020 1267">b) Duct sorbent injection – Calcium hydroxide is used as a sorbent. It is injected in flue gas upstream of the fabric filter. The rate of injection is determined based on the concentration of Sulphur Dioxide and Hydrogen Chloride. The injection rate will be optimised during commissioning.</p>													
Technique	Description	Applicability																									
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BAT Concn. Number	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement	
	g. Wet flue-gas desulphurisation (wet FGD)		Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr			
	h. Fuel choice		Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State			
BAT-associated emission levels (BAT-AELs) for SO₂ emissions to air from the combustion of solid biomass and/or peat						
Combustion plant total rated thermal input (MW_{th})		BAT-AELs for SO₂ (mg/Nm³)				
		Yearly average		Daily average or average over the sampling period		
		New plant	Existing plant ⁽⁸⁷⁾	New plant	Existing plant ⁽⁸⁸⁾	
< 100	15–70	15–100	30–175	30–215		
100–300	< 10–50	< 10–70 ⁽⁸⁹⁾	< 20–85	< 20–175 ⁽⁹⁰⁾		
≥ 300	< 10–35	< 10–50 ⁽⁸⁹⁾	< 20–70	< 20–85 ⁽⁹¹⁾		
BAT-associated emission levels (BAT-AELs) for HCl and HF emissions to air from the combustion of solid biomass and/or peat						
Combustion plant total rated thermal input (MW_{th})		BAT-AELs for HCl (mg/Nm³) ⁽⁹²⁾ ⁽⁹³⁾			BAT-AELs for HF (mg/Nm³)	
		Yearly average or average of samples obtained during one year		Daily average or average over the sampling period		Average over the sampling period
		New plant	Existing plant ⁽⁹⁴⁾ ⁽⁹⁵⁾	New plant	Existing plant ⁽⁹⁶⁾	New plant
< 100	1–7	1–15	1–12	1–35	< 1	< 1,5
100–300	1–5	1–9	1–12	1–12	< 1	< 1
≥ 300	1–5	1–5	1–12	1–12	< 1	< 1

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																																											
26	<p>In order to reduce dust and particulate-bound metal emissions to air from the combustion of solid biomass and/or peat, BAT is to use one or a combination of the techniques given below.</p> <table border="1" data-bbox="322 440 1491 836"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td>a. Electrostatic precipitator (ESP)</td> <td rowspan="2">See description in Section 8.5</td> <td rowspan="2">Generally applicable</td> </tr> <tr> <td>b. Bag filter</td> </tr> <tr> <td>c. Dry or semi-dry FGD system</td> <td>See descriptions in Section 8.5</td> <td rowspan="2">See applicability in BAT 25</td> </tr> <tr> <td>d. Wet flue-gas desulphurisation (wet FGD)</td> <td>The techniques are mainly used for SO_x, HCl and/or HF control</td> </tr> <tr> <td>e. Fuel choice</td> <td>See description in Section 8.5</td> <td>Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State</td> </tr> </tbody> </table> <p>BAT-associated emission levels (BAT-AELs) for dust emissions to air from the combustion of solid biomass and/or peat</p> <table border="1" data-bbox="322 919 1491 1203"> <thead> <tr> <th rowspan="3">Combustion plant total rated thermal input (MW_{th})</th> <th colspan="4">BAT-AELs for dust (mg/Nm³)</th> </tr> <tr> <th colspan="2">Yearly average</th> <th colspan="2">Daily average or average over the sampling period</th> </tr> <tr> <th>New plant</th> <th>Existing plant ⁽⁹⁷⁾</th> <th>New plant</th> <th>Existing plant ⁽⁹⁸⁾</th> </tr> </thead> <tbody> <tr> <td>< 100</td> <td>2–5</td> <td>2–15</td> <td>2–10</td> <td>2–22</td> </tr> <tr> <td>100–300</td> <td>2–5</td> <td>2–12</td> <td>2–10</td> <td>2–18</td> </tr> <tr> <td>≥ 300</td> <td>2–5</td> <td>2–10</td> <td>2–10</td> <td>2–16</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Electrostatic precipitator (ESP)	See description in Section 8.5	Generally applicable	b. Bag filter	c. Dry or semi-dry FGD system	See descriptions in Section 8.5	See applicability in BAT 25	d. Wet flue-gas desulphurisation (wet FGD)	The techniques are mainly used for SO _x , HCl and/or HF control	e. Fuel choice	See description in Section 8.5	Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State	Combustion plant total rated thermal input (MW _{th})	BAT-AELs for dust (mg/Nm ³)				Yearly average		Daily average or average over the sampling period		New plant	Existing plant ⁽⁹⁷⁾	New plant	Existing plant ⁽⁹⁸⁾	< 100	2–5	2–15	2–10	2–22	100–300	2–5	2–12	2–10	2–18	≥ 300	2–5	2–10	2–10	2–16	CC	<p>The operator has confirmed that the following technique will be in place:</p> <p>b) Bag Filter – A fabric filter is used to collect dust.</p>
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27	<p>In order to prevent or reduce mercury emissions to air from the combustion of solid biomass and/or peat, BAT is to use one or a combination of the techniques given below.</p> <table border="1" data-bbox="322 1278 1491 1362"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Specific techniques to reduce mercury emissions</td> </tr> <tr> <td colspan="3"> </td> </tr> </tbody> </table>	Technique	Description	Applicability	Specific techniques to reduce mercury emissions						CC	<p>The operator has confirmed that the following technique will be in place:</p> <p>a) Carbon sorbent injection in the flue-gas – Powdered activated</p>																																		
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BAT Concn. Numbe r	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																		
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Co-benefit from techniques primarily used to reduce emissions of other pollutants																							
	<table border="1"> <tr> <td data-bbox="322 715 353 751">d.</td> <td data-bbox="353 715 730 751">Electrostatic precipitator (ESP)</td> <td data-bbox="730 715 1003 1008" rowspan="2">See descriptions in Section 8.5. The techniques are mainly used for dust control</td> <td data-bbox="1003 715 1496 900" rowspan="2">Generally applicable</td> <td data-bbox="1509 708 1641 1070" rowspan="7"></td> <td data-bbox="1641 708 2033 1070" rowspan="7"></td> </tr> <tr> <td data-bbox="322 751 353 863">e.</td> <td data-bbox="353 751 730 863">Bag filter</td> </tr> <tr> <td data-bbox="322 863 353 900">f.</td> <td data-bbox="353 863 730 900">Dry or semi-dry FGD system</td> <td data-bbox="730 863 1003 1008" rowspan="2">See descriptions in Section 8.5. The techniques are mainly used for SO_x, HCl and/or HF control</td> <td data-bbox="1003 900 1496 1008" rowspan="2">See applicability in BAT 25</td> </tr> <tr> <td data-bbox="322 900 353 1008">g.</td> <td data-bbox="353 900 730 1008">Wet flue-gas desulphurisation (wet FGD)</td> </tr> </table>	d.	Electrostatic precipitator (ESP)	See descriptions in Section 8.5. The techniques are mainly used for dust control					Generally applicable			e.	Bag filter	f.	Dry or semi-dry FGD system	See descriptions in Section 8.5. The techniques are mainly used for SO _x , HCl and/or HF control	See applicability in BAT 25	g.	Wet flue-gas desulphurisation (wet FGD)				
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The BAT-associated emission level (BAT-AEL) for mercury emissions to air from the combustion of solid biomass and/or peat is < 1–5 µg/Nm ³ as average over the sampling period.																							

6. Review and assessment of derogation requests made by the operator in relation to BAT Conclusions which include an associated emission level (AEL) value

The IED enables a competent authority to allow derogations from BAT AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:

(a) the geographical location or the local environmental conditions of the installation concerned; or

(b) the technical characteristics of the installation concerned.

As part of their Regulation 61 Note response, the operator has not requested a derogation from compliance with any AEL values.

7. Emissions to Water

The consolidated permit incorporates the one current discharge to controlled waters identified as W1.

The operator submitted proposals to change the discharge route for effluent from the sewer to surface water in variation EPR/AP3037FL/V004. The discharge to surface water was assessed for hazardous pollutants and sanitary determinands in accordance with Environment agency guidance for hazardous pollutants – following the same steps as the H1. The conclusion of the assessment was that there would be no significant deterioration of the receiving watercourse.

The Water Framework Directive was also taken into account. The Tees estuary currently fails to meet WFD requirements since the levels of Dissolved Inorganic Nitrogen exceed the threshold for “good” which, together with heavy modifications to the estuary, is resulting in macroalgae and saltmarsh ecology being less than required. While the Environment Agency cannot allow emissions to the estuary which may exacerbate this situation the low volumes of the discharge and the large discharge from other sources mean the activity is unlikely to have a significant impact. Permission to discharge was allowed upon the operator contributing to mitigation measures aimed at offsetting overall environmental impacts by committing resources to the Industry Nature Conservation Association (INCA) master plan.

A limit of 70mg/l of Nitrate has been set with a monthly monitoring frequency. It was considered that this would ensure sufficient environmental protection.

8. Additional IED Chapter II requirements:

In the event of a black out National Grid would call on combustion plant to operate and may require them to do so outside their permitted conditions. We have dedicated black start plant and they are permitted to run as such but this scenario is relevant to the rest of the large combustion plant which could be called depending on the circumstances.

A risk assessment will be carried out by Energy UK/Joint Environmental Programme on behalf of Large Combustion Plant connected to the National Transmission System. Air emissions modelling will be based on generic black start scenarios to establish whether they have the potential to have local impact on the environment or not (on a national basis). If the modelling demonstrates that no significant impacts are likely, the plant can operate under condition 2.3.7. This conditions allows the hourly ELVs for plants operating under a black start instruction to be discounted for the purpose of reporting. We would also require there to be a procedure in place for minimisation of emissions in the case of a black start event and for reporting in the event of a black start. This modelling and the procedures have not been agreed in advance of the issue of the permit review and therefore a condition linking back to an improvement condition have been included in the permit.

9. Review and assessment of changes that are not part of the BAT Conclusions derived permit review.

This document should be read in conjunction with the application, supporting information and notice.

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential.
Operating techniques	
General operating techniques	We have reviewed the techniques used by the operator where they are relevant to the BAT Conclusions and compared these with the relevant guidance notes. The permit conditions ensure compliance with the relevant BREF, BAT Conclusions. The ELVs deliver compliance with the BAT-AELs.
Permit conditions	
Updating permit conditions during consolidation	We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide at least the same level of protection as those in the previous permit and in some cases will provide a higher level of protection to those in the previous permit.
Changes to the permit conditions due to an Environment Agency initiated variation	We have varied the permit as stated in the variation notice.
Pre-operational conditions	Based on the information in the application, we consider that we need to impose pre-operational conditions. Pre-operational condition POC4 has been updated to require that the operator

Aspect considered	Decision
	submits an EMA that is in accordance with BAT 1.
Improvement programme	<p>Based on the information on the application, we consider that we need to impose an improvement programme.</p> <p>We have imposed an improvement programme to ensure that:</p> <ul style="list-style-type: none"> • The operator will have a plan in place to ensure that the fuel is characterised in line with BAT 9. • The operator will provide details of energy efficiency measures that will be in place at the installation in addition to the net electrical efficiency % of the plant. • The operator will provide an assessment of the impact of dust emissions from the installation. • The operator will provide monitoring standards that will be in place. <p>We have also removed the completed improvement conditions from the permit.</p>
Emission limits	<p>We have decided that emission limits should be set for the parameters listed in the permit.</p> <p>These are described in the relevant BAT Conclusions in Section 5 of this document.</p> <p>It is considered that the ELVs/equivalent parameters or technical measures described above will ensure that significant pollution of the environment is prevented and a high level of protection for the environment is secured.</p>
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>These are described in the relevant BAT Conclusions in Section 5 of this document.</p> <p>Table S3.3 Process monitoring requirements was amended to include the</p>

Aspect considered	Decision
	<p>requirement to monitor energy efficiency after overhauls on site in line with BAT2.</p> <p>Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.</p>
Reporting	<p>We have specified reporting in the permit for the following parameters:</p> <ul style="list-style-type: none"> • Nitrogen dioxide • Carbon monoxide • Sulphur dioxide • Hydrogen Chloride • Hydrogen Fluoride • Dust • Ammonia • Mercury <p>These are described in the relevant BAT Conclusions in Section 5 of this document.</p> <p>Condition 4.2.5 has been included in the permit requiring submission of the amount of waste that is accepted and removed from the installation in accordance time frames and criteria set out in this condition. This is a standard condition reporting condition required where waste is brought onto an installation. It was not included in the permit and has been included as part of this variation.</p>
Operator competence	
Management system	There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.
Growth Duty	
Section 108 Deregulation Act 2015 – Growth duty	<p>We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.</p> <p>Paragraph 1.3 of the guidance says: “The primary role of regulators, in delivering regulation, is to achieve the regulatory</p>

Aspect considered	Decision
	<p>outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”</p> <p>We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.</p> <p>We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.</p>