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EUROPÆISK MILJØSEKRETARIAT ■ ΕΥΡΩΠΑΙΚΟ ΓΡΑΦΕΙΟ ΠΕΡΙΒΑΛΛΟΝΤΟΣ ■ EUROPEISKA MILJÖORGANISATIONERS SEKRETARIAT
DET EUROPEISKE MILJØBYRÅ ■ EUROOPPALAINEN YMPÄRISTÖTOIMISTO ■ EVROPSKI OKOLJSKI URAD ■ TAQSIMA AMBJENTALI EWROPEJA
EVROPSKÝ ÚRAD PRO ŽIVOTNÍ PROSTŘEDÍ ■ EUROPEJSKIE BIURO OCHRONY ŚRODOWISKA ■ EURÓPAI KÖRNYEZETVÉDELMI IRODA
EURÓPSKY ÚRAD PRE ŽIVOTNÉ PROSTREDIE ■ EUROPOS APLINKOS BIURAS ■ EIROPAS VIDES BIROJS ■ EUROOPA KESKKONNABÜROO

Issue from Background Paper	EEB position	EEB rationale
1.1 General issues **1.1.1 Averaging periods in the case of continuous monitoring**		
Generally, set both daily and yearly BAT-AELs.	AGREE	• As agreed at the KOM, the data collected in the TWG survey is yearly annual average and 95th %ile data for the daily average. • There have been moves to allow for the calculation of monthly averages • The BREF Guidance Document contains a data quality rating system which ranks measured data of real plant operation as a more appropriate basis for BAT than a calculation. • **Therefore the BATAELs should remain set as yearly and daily**

		***Note**: We have already submitted on this: we cannot set a precedent for 'recalculating' measured data in BREF work to provide monthly or alternative daily BATAELs*
Include in an annex to the BREF the tool proposed by NL in order to facilitate the work of those Member States that choose to use different averaging periods in permitting to those used in the BRE	DISAGREE	• The EEB previously noted some lack of correlation between calculated and real data in the NL methodology • It therefore only advocated the use of this methodology alongside yearly and daily BATAELS derived from measured data • The Bureau has also raised concerns as to the appropriateness of the statistical method for all situations, but is proposing to put it in an annex for use to develop alternative measures for permits • As implementation and permitting are not issues for the BREF/TWG, safeguards cannot be specified • The BREF should not therefore be making available for use a methodology for the development of alternative measures that has been judged to not be fully adequate for the determination of BATAELs.
1.1.2 Scope		
<u>Plants of < 50 MWth</u> • Change the first bullet point of the scope to: 'Combustion of fuels in installations with a total rated thermal input of 50 MWth or more, only when this activity takes place in combustion plants of 50 MWth or more'. • See further assessment of the 'combustion plant' definition (Section 2.11 of this BP).		

• Provisionally remove, in consultation with DG ENV, combustion plants of < 50 MWth from the scope of the LCP BREF, pending the outcome of the MCPD co-decision process.		
<u>Processes</u> • Change the third bullet point regarding activities covered for waste co-incineration to: 'Disposal or recovery of waste in waste co-incineration plants – only when taking place in combustion plants covered under 1.1 above'. • Add a bullet point explicitly excluding recovery boilers and TRS burners used in the PP sector. • Modify the definition of 'process furnaces or heaters' to explicitly exclude steam crackers from the scope.	AGREE	
• The scope covers diesel engines. See further details of the proposed BAT-AELs in the appropriate section of this BP (1.5.2).	AGREE	• This was agreed at the KOM • In accordance with that agreement, the EEB has collected plant-specific data ***<u>Note</u>:*** *This is particularly relevant to small isolated systems*
• Remove the general mention of waste co-incineration from the last bullet of excluded activities, while keeping the explicit exclusion of waste incineration		
• Do not exclude storage activities.		• Proper management of storage activities is vital e.g. storage of chemicals for SCR; storage of fuels; etc

• Remove coke battery furnaces and cowpers from the list of excluded processes. • Include the thresholds corresponding to disposal or recovery of waste in waste co-incineration plants (activity 5.2 in the Annex I to the IED) are not mentioned in the scope. • Remove 'combustion' and 'gasification associated to a combustion process' after the three introductory bullet points. <u>Fuels/wastes</u> • Do not exclude the combustion of biogas, landfill gas, or mine gas. • Explicitly exclude the combustion of refinery fuels. • Add a bullet point clearly excluding distillation and conversion residues from the refining of crude oil. • Do not add the adjective 'commercial' in the definition of gas oil-HFO. • Replace the partial list of biomass sources with a reference to the legal definition of IED Article 3(31). • Do not add 'non-waste' before 'industrial process fuels'. • Add 'e.g.' in the brackets before mentioning the process fuels from the chemical and iron and steel industries.	QUERY petroleum coke	• Does this include petroleum coke, which is part of the fuel diet of several reference plants? • Section 2.8.1.1 of D1 refers to the proper storage and handling of petroleum coke, which is vital if Ni, Va and PAHs are not to be blown over the neighbouring population

• Remove 'production residues' from the brackets after 'industry-specific fuels' and add 'e.g.' before natural, in brackets. • Exclude waste co-incineration where more than 40 % of the resulting heat release comes from hazardous waste and waste co-incineration plants burning only waste with the exception of those burning biomass-type waste such as demolition wood. • Delete 'brown coal' from the list of solid fuels covered. • Remove 'primary' before solid and liquid fuels.		• The EEB supports the request by Sweden on this issue to close gaps and ensure a level playing field
1.1.3 Consideration of load modes, load factors and limited lifetime for setting BAT conclusions and BAT-AEPLs		
• <u>Equivalent full load factor</u> -- Assess case by case the need to address the influence of load factors in the fuel-specific BAT conclusions, e.g. via footnotes to the BAT-AEPLs or by adding information under the applicability of techniques. • <u>Load modes</u> -- Assess case-by-case, for each plant category, the need to address the influence of load modes in the fuel-specific BAT conclusions e.g. Assess case by case, for each plant category, the need to address the influence of load modes in the fuel-specific BAT conclusions, e.g. via footnotes to the BAT-AEPLs or by adding information under the applicability of techniques. • Limit the applicability of the BAT-conclusions on energy efficiency and the BAT-AEELs only to plants operated in mid-merit or base load modes.	} } } } } AGREE } } } }	• It was agreed at the KOM that load modes would be considered <u>where relevant</u> ***<u>Note</u>:*** *'Where relevant' is very important to containing this issue in the face of the wish by some parties to see widespread separate BATAELs for sub-base load – often this is not justified in the data*

• Limited lifetime -- Do not set general BAT conclusions and BAT-AEPLs depending on the expected plant lifetime	AGREE	• Practical experience has shown that estimates of remaining life tend to keep being extended, thereby resulting in sequentially lower limits if separate BATAELs are set • The limited life derogation gives a finite number of remaining operating hours but this is for plants that by definition cannot be BAT
1.1.4 Subtraction of the measurement uncertainty		
• Delete the sentence in the BAT conclusions on the subtraction of the measurement uncertainty. • Clarify in Chapter 3 of the BREF that raw data without subtraction of the measurement uncertainty were used for the analysis and the setting of BAT. • Add in the BREF information about the averaged uncertainty assigned to measured results from European combustion plants, derived from data collected at plant level.	} } } AGREE } } } } }	• Uncertainty is a fact of measurement • How individual MSs chose to deal with it is a matter of implementation and therefore outside the scope of the BREF • Providing average data on how EU MSs deal with uncertainty is indicative without being proscriptive • BAT conclusions should be transparent as to how the uncertainty was factored in
1.1.5 Type of BAT conclusions on energy efficiency		
• Set energy efficiency levels in the form of design values based on the design data submitted by the TFEE in 2014 and on the yearly data from the data collection exercise from 2012 after filtering (e.g. by load). • Set a monitoring frequency for a performance test corresponding to 'after the commissioning of the plant and after every modification that could significantly affect the energy efficiency of the plant'.	AGREE AGREE	• It is important that both are used because the 2012 data is sometimes used to make up for limitations in the TFEE data • It is important to have an original baseline that is updated as relevant • It is necessary to define what constitutes significantly affecting the energy efficiency of the plant

• Delete 'whose recoverable heat generation does/does not exceed the heat demand' in the BAT-AEEL tables on energy efficiency. • Remove the word 'above' from the higher ends of the BAT-AELs.	DISAGREE	• This is a circular argument, because the BP justifies it on consistency with practice for the lower limits without allowing discussion on whether it should apply to those lower limits • Sometimes expressing lower limits as not finite is the best way to represent the situation • Similarly, for energy efficiency it would be regressive to suggest that energy efficiency requirements cannot exceed the upper BATAELs
1.1.6 Type of conclusions on CO emissions		
• General ➢ Keep BAT conclusion on CO. • Averaging periods ➢ Do not propose daily averages for CO.	DISAGREE	• CO is an indicator of good plant performance
1.2 General BAT conclusions **1.2.1 Monitoring**		
• Keep BAT conclusions on monitoring.	AGREE	• Proper monitoring is an essential component in ensuring compliance with BATAELs
• Summarise the monitoring requirements for emissions to air and water in separate BAT conclusions.	OF NO CONCERN	• The EEB does not think that it makes a significant difference whether the monitoring requirements for air and water are together or separate
• Specify that monitoring frequencies are given as minimum frequencies.	AGREE	• Additional frequencies are good practice and should not be excluded

• Include applicability restrictions and/or provisions for less frequent monitoring regimes, where deemed appropriate (see the detailed assessment for each parameter in the following sections on emissions to air and water).	ALLOW FOR THIS in principle	• It may not always be appropriate to set one monitoring requirement for all situations • However, the BP deems restrictions on monitoring to be appropriate far more frequently than the EEB thinks is justified
• Do not add a BAT conclusion on the calibration of monitoring instruments.	AGREE	• The USA has this but it is more a topic for the Article 13 Forum than the TWG
1.2.1.2 BAT 2 – Monitoring of emissions to air and water		
<u>General</u> • Keep the prevalence for EN standards in the BAT statement.	AGREE	• This supports a more consistent approach to monitoring which will assist a consistent approach to the implementation of the BATAELs
• Keep the proposed statement on the minimum monitoring frequency.	AGREE	• This is an important statement that makes clear that there is an option for greater frequency
<u>Emissions to air (a) and to water (b)</u> • Remove indications on the exact location where to perform the monitoring.		***<u>Note</u>:*** *BP discussion of this seems to be a legal matter of 'where the emissions leave the installation' constrained by the exact location being a matter of implementation within MSs*
• Add a BAT conclusion on the monitoring of key process parameters relevant for emissions to air and water.	AGREE	• Legally it seems that IED only requires inspection at the point of release to water • Therefore waste water from a particular process such as scrubbers are treated and then mixed with other water streams by the point of discharge

• Summarise the monitoring requirements for emissions to air and water in separate BAT conclusions.		• Therefore keep BATAELs for processes e.g. cleaning of scrubber water
1.2.1.3 BAT 3 – Process parameters and other environmental parameters		
<u>General</u> • Define separate BAT conclusions on the monitoring of key process parameters relevant for emissions to air and water in BAT 3 bis, on the monitoring of emissions to air in BAT 3 ter and on the monitoring of emissions to water from flue-gas treatment in BAT 3 quater. Discuss in detail the appropriateness and the associated monitoring frequencies for each parameter below. • Change the point of measurement to 'emissions to air' <u>Energy output</u> • Remove the continuous monitoring of the energy output. Keep the periodic monitoring of energy efficiency through performance tests to be carried out after the commissioning of the plant and after every modification that could significantly affect the energy efficiency of the plant (BAT 3). <u>Waste generation:</u> Remove the parameter. <u>Waste water flow:</u> • Move to a new BAT on monitoring of key process parameters relevant for emissions to air and water (BAT 3 bis);		

• focus on waste water from flue-gas treatment; • change the monitoring frequency to: 'continuously'. <u>Noise level:</u> • Add a noise management plan to the Environmental Management Plan (BAT 1) including noise monitoring provisions. <u>Metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V, Cd, and Tl emissions to air):</u> • Move to a new BAT on monitoring of emissions to air (BAT 3 ter). • Decrease the frequency to at least once every year for coal and/or lignite, biomass and/or peat, and HFO- and/or gas oil-fired boilers and engines. • Add a footnote allowing the adjustment of the appropriate list of pollutants to monitor • and the adjustment of the monitoring frequency based on a risk assessment. <u>Zn emissions to air:</u> • Move to a new BAT on monitoring of emissions to air (BAT 3 ter). • Merge this pollutant with the other metals. <u>N2O emissions to air:</u> • Keep the periodic monitoring of this pollutant (BAT 3 ter); • change the monitoring frequency to at least once every year; • add a footnote: 'the measurement is performed with a boiler load of > 70 %'. <u>Additional parameters</u> • Add Se in the list of metals to be monitored based on a risk assessment (BAT 3 ter).	AGREE	• This is an important metal for further study in the next BREF review • Data will therefore be very relevant

• Do not set additional general monitoring for NMVOC, CH4 or NH3		
1.2.2 General environmental and combustion performance **1.2.2.1 BAT 5 – Fuel characterisation**		
<u>General</u> • Reformulate the BAT statement to clearly distinguish between characterisation and testing. • Remove the column on sampling frequency and add in the statement the possibility to define this frequency according to the fuel variability and to a risk assessment. • Keep a list of parameters to be characterised. • Keep the reference to EN standards as reference. • Add the possibility to use other standards in case EN standards do not exist. <u>Biomass</u> • Add peat to biomass. • Include Cl and F in the list of compounds to characterise. • Detail the list of metals consistently with the list proposed for coal/lignite. <u>Coal/lignite</u> • Keep the proposed list of parameter to monitor. <u>HFO/LFO</u> • Keep the periodic testing of some pollutants. • Replace 'metals' by 'Ni and V'. Change 'LFO' to 'gas oil'.	} } }DISAGREE } } } DISAGREE	• The base case of sampling frequencies should be preserved with the alternative of applying a risk/fuel variability approach <u>where a case can be made</u> ***<u>Note</u>:*** *The BP's proposal to abandon any formal standards and move solely to a risk/fuel variability approach is too open-ended and liable to abuse/neglect* • It is important to include Hg

Natural gas • Keep the list of parameters to characterise; • add the Wobbe index and the hydrogen content. Process fuels from the chemical industry • Add a footnote stating that the list of parameters to be characterised can be reduced based on an assessment of the compounds that could be reasonably expected to be found from the products and processes applied at the chemical installation supplying the fuels. Wastes: • Do not mention specifically the EN 15359 standard. Other fuels: • include iron and steel process gases in the table.		
1.2.2.2 BAT 6 – Emissions during start-up and shutdown periods		
• Propose a modification of BAT 6 to include techniques that are focussed on limitation of the number, the duration and the emissions during start-up and shutdown periods	AGREE	• Limiting the number, duration and emissions of SUSD periods are each essential components of achieving an overall reduction in the very considerable contribution that these periods make to the overall pollution coming from an installation
• Propose a new BAT (6 bis) related to a management plan for minimising the occurrence and duration of other than normal operating conditions (OTNOC).	AGREE	• An overall coherent plan will inevitably be more successful in reducing these emissions than an uncoordinated series of separate measures
• Propose a new BAT (6 ter) for the monitoring of emissions during OTNOC.	AGREE	• Information on emissions provides feedback to the operator on the scale of the problem and the effectiveness of abatement techniques applied

		• It is therefore essential to their management • This is further reinforced by the fact that the EIA for the habitat, ambient air quality and waste water framework directives require total load per time unit, including emissions during OTNOC.
• Propose a new BAT (6 quater) that in order to reduce emissions to air, BAT is to ensure by appropriate design, maintenance and/or operation that the emission abatement systems are used at optimal capacity and availability during normal operating conditions (NOC).	AGREE	• SUSD periods inevitably involve delays in the abatement equipment coming fully on stream • However, these delays can be minimised if the operation of these techniques is optimised
1.2.3 BAT 11 – Reduction of emissions to water		
<u>General</u> • Harmonise the BAT statement with recent BAT conclusions, refer to waste water from flue gas treatment, and refer to an appropriate combination of techniques. Specify that the treatment should be carried out as close as possible to the source (see CAK and CWW BREF).	CLARIFY	ADD: 'Specify that the treatment should be carried out as close as possible to the source to avoid dilution and ***<u>to comply with BATAELs set on the basis of waste water from the flue gas treatment only</u>***' • It is potentially confusing that some plants have reported emissions resulting from multiple streams and that these are included on the graphs from which the BATAELs are derived.
<u>Techniques</u> • Zero liquid discharge (ZLD) ➢ Delete this technique and the other	AGREE	• ZLD is an outcome rather than a technique • It is therefore appropriate to replace this with the

categories of techniques and replace them by the individual treatment techniques. • Other techniques ➢ Move the technique 'evaporation' to the BAT conclusion on water usage and reformulate the applicability restriction. ➢ Do not add the technique 'addition of coal/lignite ash to WFGD waste water'. ➢ Add the following end-of-pipe techniques to the table: adsorption on activated carbon, aerobic biological treatment, anoxic/anaerobic biological treatment, ion exchange, flotation, oxidation, and stripping. Add a primary technique on optimised combustion and operation of waste gas abatement techniques. ➢ Add a column specifying typical pollutants abated as in the CWW BREF. Specify that the techniques are generally applicable, except in the case of aerobic biological treatment, where nitrification may be impeded by high chloride concentrations. Add the description of the techniques at the end of the BAT conclusions.	AGREE	individual techniques that can be used to achieve that outcome • Adding coal/lignite ash to WGFD wastewater produces a waste rather than the recycling of the ash • The IED requires an integrated approach to the environmental management of industrial installations • This technique cannot therefore be BAT

1.2.3 BAT 11 – Reduction of emissions to water		
<u>General</u> • Do not include further guidance on how to understand or use the BAT-AELs.		
• Only set BAT-AELs for waste water from flue gas treatment and clarify the wording of the table caption. • Specify that the BAT-AELs refer to direct discharges to a receiving water body at the point where the emission leaves the installation. • Do not specify how to take into account potential intake loads.	AGREE	• This avoids variations due to other waste streams • The wording on the table caption was indeed misleading
<u>Averaging period</u> • Express the BAT-AEL as short-term averages (24-hour composite samples) and revise the numerical values accordingly.	AGREE/ DISAGREE	• Shorter term averages provide better control the proper functioning of the WWTP, and can be especially important where controls reflect several industrial sources emitting into the same waterway • However, average BATAELs provide better control of overall emissions to water • **<u>Therefore emissions to water should have both maximum and yearly BATAELs</u>**
<u>Monitoring frequency</u> • Keep a minimum monitoring frequency of at least once every month without further specifications.	AGREE/DISAGREE	• Monthly is the most common frequency amongst sampled plants • LCPs are major contributors of emissions to water of Fl, Cl and metals/metalloids (EPRTR), so there should be no further specifications/limitations upon the monitoring frequency • Ensure monitoring frequency relates to the Water

		Framework Directive PHS/PS pollutants
<u>TOC/COD</u> • Add a primary technique on optimised combustion and operation of waste gas abatement techniques (see above).	AGREE	• Both reduce TOC/COD loads
• Express the BAT-AEL for organic contaminants both with the parameter TOC and COD. Clarify that either the BAT-AEL for TOC or COD applies.	OPEN QUESTION Do we want to argue that COD is no longer BAT?	***<u>Note</u>:*** *COD is certainly the long-established way of measuring emissions of organic compound. However, it is being increasingly replaced by TOC because that does not use very toxic compounds such as Hg. The numerical differences between the 2 measures reflect the generalised COD/TOC ratio.*
• Set the BAT-AEL ➢ for TOC at 20–50 mg/l <u>daily average</u>	DISAGREE with upper limit	• The proposed upper BATAEL is set by a significant rounding up of the maximum data for Plant 121 (from 42.8 to 50 mg/l) • This one plant has been used to increase the upper BATAEL by a factor of at least 2.5 compared with the maximum emissions recorded by the other plants in the sample. • There is nothing distinctive about Plant 121 in terms of fuel, age, capacity, load factor, SOx flue gas treatment and WWTP technique • This is therefore allowing one plant a totally disproportionate influence on the BATAEL that cannot be justified • The BATAEL should instead be set by Plant 123 • **<u>The daily BATAEL should therefore be <20 mg/l (Plant 123)</u>**
➢ TOC <u>yearly average</u>		

	INCLUDE YEARLY AVERAGE	• **<u>The upper limit of the yearly TOC BATael should be 16 mg/l (plant 123)</u>** • This includes all sampled types of WWT processes and single and multiple flue gas treatment streams • It also covers both coal and lignite plants, the full age range and sampled sizes and load factors
➢ for COD at 60–150 mg/l <u>daily average</u>.	DISAGREE with upper limit	• The proposed BATAEL appears to have been set by a significant rounding up of the data for plant 223 • However, as that plant includes other streams, it cannot set the BATAEL • There are only 4 plants within the proposed range that have emissions deriving from flue gas treatment only, and the one with the highest emissions is Plant 122a at 75 mg/l • However, this adds nothing in terms of fuel, age, capacity, load factor, SOx flue gas treatment and WWTP technique to a BATAEL set by the 2 better performing plants – 662 and 123 (maximum emissions of 51.3 and 57 mg/l respectively) • **<u>The upper daily BATAEL should therefore be 60 mg/l (Plant 123)</u>**
➢ COD <u>yearly average</u>	INCLUDE YEARLY AVERAGE	• **<u>The upper limit of the yearly COD BATael should be 45 mg/l (plant 133)</u>** • This includes all sampled types of WWT processes and single and multiple flue gas treatment streams • It also covers both coal and lignite plants, the full age range and sampled sizes and load factors

		Note: *Both yearly and daily align the COD/TOC emissions in the generically observed ratio for combustion plants.*
Total suspended solids (TSS) • Set the BAT-AEL at 10–30 mg/l as daily average.	DISAGREE with upper limit	• Whether the proposed upper limit is set by plant 441-2 or 384-1, these plants include other streams within the plant and therefore cannot set the BATAEL • The upper BATAEL therefore cannot be more than 25 mg/l (Plant 367) • However, this adds nothing to an upper BATAEL set at Plant 456, which includes all fuels, capacities, load factors, SOx flue gas treatments and WWTP techniques • **The upper BATAEL should therefore be 20 mg/l (Plant 456)**
• TSS as yearly average	INCLUDE YEARLY AVERAGE	• **The yearly BATael limit for TSS should be 10 mg/l (plant 453)** • This easily includes all types of WWTP processes and single and multiple flue gas treatment streams • It also covers all types of fuel, plant sizes, ages and load factors (down to 1700 hours)
Fluoride (F-) • Set the BAT-AEL at 10–25 mg/l as daily average.	DISAGREE with upper limit	• The proposed upper BATAEL is set by Plant 121 • However, this adds nothing to a BATAEL set at Plant 123 which covers the sampled fuel and the full range of age, capacity, load factor, SOx flue gas treatment and WWTP technique

• F as a <u>yearly average</u>	INCLUDE YEARLY AVERAGE	• **<u>The upper BATAEL should therefore be 12mg/l (Plant 123)</u>** • **<u>The upper limit of the yearly fluoride BATael should be 10 mg/l (plant 123)</u>** • This includes all sampled types of WWT processes and single and multiple flue gas treatment streams • It also covers both coal and lignite plants, the full age range and the sampled size and load factors
<u>Chloride (Cl-)</u> • Delete the BAT-AEL for chloride. • Keep a monthly monitoring requirement. • Specify in the BREF chapter on concluding remarks and recommendations for future work that further information on techniques to reduce chloride emissions should be collected during the next BREF review.	AGREE } AGREE } AGREE }	• There are problems assessing the environmental benefits <u>vs</u> the cross-media impacts of available techniques, an essential component of determining BAT • It is appropriate to recommend future work on this whilst continuing monitoring ***<u>Note</u>:*** *For these reasons, BATAELs for Cl have not been set in any BAT conclusions – it would be difficult to move against that and questionable in terms of environmental impacts*
<u>Sulphate (SO42-)</u> • Keep the BAT-AEL and base it on the solubility of calcium sulphate. • Set the BAT-AEL at 1.3–2.0 g/l <u>as daily average</u>.	} } } }] }DO NOT OPPOSE }	• Sulphates are usually reduced by precipitation with calcium salts, and residual sulphate depends upon temperature and salinity • The range proposed is for low-salinity water, but there is a lack of data on exact salinity and water temperature for each reference plant • It is therefore impossible to separate water conditions

	} } }]	from god/bad operation of the plant ***<u>Note</u>:*** *Even when possible impacts of water salinity and temperature are ignored, there is relatively limited scope for reducing the limits*
• Include a footnote that the BAT-AEL only applies to plants using calcium compounds in flue gas treatment.	AGREE	• This is the technique upon which the BATAELs have been set
• Delete the footnote on the lower end of the range.	AGREE	• Referring to the bottom of the range applying to plants mixing streams becomes obsolete when these are specifically excluded from the BATAEL
<u>Sulphide (S2-)</u> • Set the BAT-AEL for easily released sulphide at 0.1–0.2 mg/l as <u>daily average</u>.	AGREE	• It is regressive to refer to the previous BREF to establish later BATAELs • However, there is very little maximum data, and the data for Plant 141 appears to be incorrect – the maximum emission is smaller than the average • **<u>It is therefore necessary to continue with the BATAELs established in the current BREF</u>** ***<u>Note</u>:*** *Given the lack of data for setting daily limits, it is especially important to set yearly average ones*
• Sulphide <u>yearly average</u>	INCLUDE YEARLY AVERAGE	• **<u>The upper limit of the yearly sulphide BATael should be 0.1 mg/l (plant 133)</u>** • This includes the sampled WWT process and includes 3 plants, all measuring only the flue gas treatment stream • It also covers both coal and lignite plants, the full age

		range and the sampled size and load factor
Sulphite (SO32-) • Set the BAT-AEL at 1–20 mg/l as daily average.	DISAGREE	• There are no reference plants even nearly supporting an upper BATAEL of 20 mg/l – the nearest is Plant 121, with a maximum emission of 13 mg/l (the highest recorded) • However, there is nothing distinctive about Plant 121 in terms of age, fuel, operating hours, SOx abatement, WWTP technology or single/multiple flue gas treatment streams • The upper BATAEL should therefore be set by Plant 141 • **The upper BATAEL should therefore be 5 mg/l (Plant 141)** ***Note:*** *With the worst performing plant recording maximum data of 13 mg/l and an upper BATAEL of 20 mg/Nm^3 being specified, it is hardly surprising that this is a dramatic reduction.*
• Sulphite yearly average	INCLUDE YEARLY AVERAGE	• **The upper limit of the yearly sulphite BATael should be 2.5 mg/l (plant 141)** • This accords with the basis of the daily upper BATAEL and excludes Plant 121, the inclusion of which would almost double the BATAEL set by the other 6 plants – a disproportionate influence • It includes the sampled type of WWT processes and single and multiple flue gas treatment streams • It also covers both coal and lignite plants, the full age range and the sampled size and load factor
Total nitrogen • Delete the BAT-AEL for total nitrogen.	AGREE }	• There is a lack of data on water emissions from flue gas treatment to support existing LCP BREF BATAEL that is not

• Keep a monthly monitoring requirement. • Specify in the BREF chapter on concluding remarks and recommendations for future work that further information on techniques to reduce total nitrogen emissions should be collected during the next BREF review.	AGREE } AGREE }	mixed with other streams • CWW BREF set a precedent of requiring biological treatment before BATAELS are set *<u>Note</u>: There is a case that could be made for setting BATAELs from reference plant data but it would be at least 3 x as high as that in the current BREF – not in our interests*
<u>THC</u> • Delete the BAT-AEL for THC.	AGREE	• There is no data reported that is not mixed with other streams • There is therefore no basis for a BATAEL based on solely flue gas treatment streams
<u>Metals an metalloids</u> • Delete the BAT-AEL for Sb+As+Pb+Cr+Co+Cu+Mn+ Ni+V.	AGREE	• Only 1 plant reported emissions from only the flue gas treatment stream • There is therefore no basis for setting a BATAEL based solely on flue gas treatment streams
• Do not set BAT-AELs for Co, Mn, Sb, Tl, and V.	AGREE	• There are very few or even no plants reporting emissions from only the flue gas treatment stream • There is therefore no basis for setting a BATAEL based solely on flue gas treatment streams
• Set the following BAT-AELs for individual metals as daily averages:	AGREE/DISAGREE	• Shorter term averages provide better control the proper functioning of the WWTP, and can be especially important where controls reflect several industrial sources emitting into the same waterway • However, average BATAELs provide better control of overall emissions to water

		• **<u>Therefore emissions to water should have both maximum and yearly BATAELs</u>**
➢ As 10–50 µg/l, <u>daily average</u>	DISAGREE with both upper and lower BATAELS	<u>Daily upper BATAEL</u> • There are no reference plants for an upper BATAEL of 50ug/l – it lies between Plants 141 (30 ug/l) and 121 (70 ug/l) • However, there is nothing distinctive about plant 141 that cannot better be represented by Plant 662 in terms of fuel, age, capacity, operating hours, SOx abatement and WWTP technique. • **<u>Plant 662 should therefore represent the upper BATAEL at 20 ug/l</u>** <u>Daily lower BATAEL</u> • The best performing plant is 384-1 with emissions of 0 ug/l, presumably below the level of detection • However this has other streams mixed in with that from the flue gas treatment • **<u>Therefore the lower limit should be 1.2 ug/l (Plant 455)</u>**
➢ As <u>yearly average</u>	INCLUDE YEARLY AVERAGES	<u>Yearly upper BATAEL</u> • **<u>The upper limit of the yearly arsenic BATael should be 8 ug/l (plant 141)</u>** • This includes all sampled types of WWT processes and single and multiple flue gas treatment streams • It also covers all fuels, ages, plant sizes presented on the graph and sampled load factors

		<u>Yearly lower limit</u> • The best performing plant is 384-1 with emissions of0 ug/l, presumably below the level of detection. • However this has other streams mixed in with that from the flue gas treatment • **<u>Therefore the lower limit should be 0.3 ug/l (Plant 479)</u>**
➢ Cd 2–5 µg/l, <u>daily average</u>	DISAGREE with both upper and lower BATAELS	<u>Daily upper limit</u> • The propose upper BATAEL is set by plant 197, which includes other streams and cannot therefore be BAT • It also duplicates plant and abatement characteristics that are represented in better performing plants elsewhere in the sample. • Setting the BATAEL at plant 121 includes all fuels and fuel combinations and the full range of age, capacity, operating hours, SOx abatement and WWTP technique. • **<u>The upper daily BATAEL should therefore be 2 ug/l (Plant 121)</u>** <u>Daily lower limit</u> • Of the 14 plants reporting maximum Cd data, 4 plants achieve emissions lower than the proposed lower limit • Plant 662 has emissions 0 ug/Nm^3, presumably below the level of detection • However, plant 476 emits 0.2 ug/Nm^3 • **<u>The lower daily BATAEL should therefore reflect this and be set at <0.2 ug/l</u>**

➢ Cd yearly average	INCLUDE YEARLY AVERAGE	Yearly upper BATAEL • The top 9 best performing plants form provide a coherent group after which emissions from plants measuring flue gas streams increase rapidly. • The top 9 plants cover a range of fuels and fuel combinations, and the full range of age, capacity, operating hours, SOx abatement and WWTP technique. • **The upper yearly BATAEL should therefore be 1.5 ug/l (Plant 367)** Yearly lower limit • The best performing plant, 662, has emissions of 0 ug/l, presumably below the level of detection • 3 plants have average emissions of 1 ug/l – 476, 455 and 131 • **Therefore the lower limit should be <0.1 ug/l (Plants 476, 455 and 131)**
➢ Cr 10–50 µg/l, daily average	DISAGREE with both upper and lower BATAELS	Daily upper limit • There is no reference plant corresponding to the proposed upper limit. • The closest plant within that limit is 233, which has maximum emissions of 40 ug/l but includes other waste streams and cannot therefore provide a proper basis for the BATAEL • Further, plant 233 adds nothing to an upper BATAEL set by plant 456, 28 MWth, commissioned in 1984 and operating 2800 hours. • This BATAEL covers all sampled fuels, the full age range,

➢ Cr <u>yearly average</u>	INCLUDE YEARLY AVERAGE	and all sizes, operating hours and SO_2 flue gas treatments. • **<u>The upper daily BATAEL should therefore be 12 ug/l (Plant 456)</u>** <u>Daily lower limit</u> • Of the 18 plants sampled, 1/3 have maximum emissions lower than the proposed lower BATAEL limit, with no grounds for excluding them from the BATAEL • Plant 662 achieves 0 ug/l, presumably below the level of detection, whilst Plant 455 has maximum emissions of 1.6ug/nm^3 • **<u>The lower BATAEL should therefore reflect this and be set at < 2 ug/l</u>** <u>Yearly upper limit</u> • The EEB has proposed Plant 456 as the reference for the upper daily BATAEL • This plant is 28 MWth, was commissioned in 1984 and operates for 2800 hours. • As the basis for an upper yearly BATAEL, it would cover a range of fuels, the full age range, and all sizes, operating hours and SO_2 flue gas treatments. • **<u>The upper yearly BATAEL should therefore be 4 ug/l (Plant 456)</u>** <u>Yearly lower limit</u> • The best performing plant, 662, has emissions of 0 ug/l, presumably below the level of detection • Plant 476 has emissions of 0.7 ug/Nm3

		• **<u>Therefore the lower limit should be <0.7 ug/l (Plant 476)</u>**
➢ Cu 10–50 µg/l, <u>daily average</u>	DISAGREE with both upper and lower BATAELS	<u>Daily upper limit</u> • There is no reference plant corresponding to the proposed upper limit • Plants 386-1 and 223 have maximum emissions of 32 and 37 ug/l respectively, but both include other streams and cannot therefore provide a proper basis for a the BATAEL • The closest plant within that limit that does not include other streams is 141, which has maximum emissions of 20 ug/l • **<u>The upper BATAEL should therefore be 20 ug/l (Plant 141)</u>** <u>Daily lower limit</u> • Of the 16 plants sampled, 5 have maximum emissions lower than the proposed lower BATAEL limit, with no grounds for excluding them from the BATAEL • Plant 662 has emissions of 0 ug/l – presumably below the level of detection -- and Plant 455 emits 3.7 ug/l • **<u>The lower BATAEL should therefore reflect this and be set at < 3.7 ug/l</u>**
➢ Cu <u>yearly average</u>	INCLUDE YEARLY AVERAGE	<u>Yearly upper limit</u> • The EEB has proposed Plant 456 as the reference for the upper daily BATAEL • This plant is 28 MWth, was commissioned in 1984 and operates for 2800 hours. • As the basis also for an upper yearly BATAEL, it would

		cover a range of fuels, the full age range, and all sizes, operating hours and SO_2 flue gas treatments. • **<u>The upper yearly BATAEL should therefore be 10 ug/l (Plant 456)</u>** <u>Yearly lower limit</u> • The best performing plant, 662, has emissions of 0 ug/l, presumably below the level of detection • The next best performing plant whose emissions do not include other streams is Plant 131, with emissions of 1 ug/Nm^3 • **<u>The lower yearly BATAEL should therefore be <10 ug/l (Plant 456)</u>**
➢ Hg 0.5–5 µg/l, <u>daily limit</u>	DISAGREE with both upper and lower BATAELS	<u>Daily upper limit</u> • The proposed upper limit is nominally set by Plant 386-1, but as this includes streams other than just the flue gas treatment, it cannot form the basis of BAT • Considering only flue gas treatment streams, the upper limit could at most be set by plant 141, with maximum emissions of 3 ug/l • However, plant 141 adds nothing to an upper BATAEL set by plant 476 (1 ug/l) which covers all sampled fuels, the full range of age, size, operating hours, SO_2 flue gas treatments and WWTP techniques. • **<u>The upper BATAEL should therefore be 1 ug/l (Plant 476)</u>** <u>Daily lower limit</u> • Of the 16 plants sampled, 1/4 have maximum emissions

➢ Hg <u>yearly limit</u>	INCLUDE YEARLY AVERAGE	lower than the proposed lower BATAEL limit, with no grounds for excluding them from the BATAEL • Plant 662 measuring only the flue gas treatment stream has emissions of 0 ug/l, presumably below the level of detection • Plant 479 has no maximum data, whilst Plant 496 has maximum emissions of 0.05 ug/l • **<u>Therefore the lower limit should be <0.05 ug/l (Plant 496)</u>** ***<u>Supporting information</u>:*** *FoI data for Plants 132, 122-1, 122-2, 131, 121 and 141.* <u>Yearly upper limit</u> • The EEB has proposed Plant 456 as the reference for the upper daily BATAEL • This plant is 28 MWth, was commissioned in 1984 and operates for 2800 hours. • As the basis for an upper yearly BATAEL, it would cover a range of fuels, the full age range, and all sizes, operating hours and SO_2 flue gas treatments. • **<u>The upper yearly BATAEL should therefore be 0.8 ug/l (Plant 456)</u>** <u>Yearly lower limit</u> • 2 plants measuring only the flue gas treatment stream have emissions of 0 ug/l, presumably below the level of detection – 662 and 479 • Plant 496 has emissions 0.05 ug/l

		• Therefore the lower limit should be <0.05 ug/l (Plant 496) ***<u>Supporting information</u>:*** *Plant Heyden in Germany has average emissions of 0.056 ug/l*
➢ Ni 10–50 µg/l, <u>daily limit</u>	DISAGREE with both upper and lower BATAELS	<u>Upper daily limit</u> • The proposed upper limit is nominally set by Plant 197, but this includes streams other than just the flue gas treatment stream. • The next best performing plant is 121 with maximum emissions of 42 ug/l • However, plant 121 adds nothing to an upper BATAEL set by plants 662 and 138 (15 ug/l) which covers all sampled fuels, the full range of age, size, operating hours, SO_2 flue gas treatments and WWTP techniques. • **<u>The upper BATAEL should therefore be 15 ug/l (Plants 662 and 138))</u>** ***<u>Note</u>:*** *Plant 123 in theory would allow us to go higher but it has min/average/max data at the same level – too questionable when we are setting maximum and average BATAELs* <u>Lower daily limit</u> • Of the 17 plants sampled, 6 have maximum emissions lower than the proposed lower BATAEL limit, with no grounds for excluding them from the BATAEL • Plant 455 has emissions of 1.4 ug/l • **<u>The lower daily BATAEL should therefore reflect this and be set at 1.4 ug/l (Plant 455)</u>**

➢ Ni <u>yearly limit</u>	INCLUDE YEARLY AVERAGE	<u>Upper yearly limit</u> • An upper limit set by Plant 123, includes all types of WWT process, the full age range, all plant sizes and load factors (down to 1700 hours), and multiple fuels • **<u>The upper yearly BATAEL should therefore be 10 ug/l (Plant 123)</u>** <u>Lower limit (average)</u> • Plant 473 has emissions of 1.3 ug/l • **<u>Therefore the lower limit should be 1.3 ug/l (Plant 473)</u>**
➢ Pb 10–20 µg/l, <u>daily limit</u>	DISAGREE with both upper and lower	<u>Upper daily limit</u> • The upper limit is set by plant 141 • However, plant 141 adds nothing to an upper BATAEL set by plant 456 (16ug/l) which covers all sampled fuels, the full range of age, size, operating hours, SO_2 flue gas treatments and WWTP techniques. • **<u>The upper BATAEL should therefore be 16 ug/l (Plant 456)</u>** ***<u>Note</u>:*** *This cannot go lower and reasonably cover* the *fuels – it would omit a fully biomass plant* <u>Lower daily limit</u> • Of the 16 plants sampled, 6 have maximum emissions lower than the proposed lower BATAEL limit, with no grounds for excluding them from the BATAEL • Plant 662 has emissions of 0 ug/l, presumably below the level of detection, whilst plant 455 has emissions of 1.9

➢ Pb <u>yearly average</u>	INCLUDE YEARLY AVERAGE	ug/l • **<u>The lower BATAEL should therefore reflect this and be set at <2 ug/l</u>** <u>Upper yearly limit</u> • An upper limit of 5 ug/l (Plant 123) includes all types of WWT process and a wide range of fuels. • It also covers the full age range, plant sizes and load factors (down to 2800 hours). • **<u>Therefore the upper limit of the yearly lead BATael should be 5 ug/l (Plant 123)</u>** <u>Lower yearly limit</u> • Plants 662 and 479 measuring only the flue gas treatment stream have emissions of 0 ug/l, presumably below the level of detection • Plant 473 has emissions of 0.6 ug/l • **<u>Therefore the lower limit should be <0.6 ug/l (Plant 473)</u>**
➢ Zn 50–200 µg/l. <u>Daily limit</u>	DISAGREE with both upper and lower BATAELS	<u>Daily upper limit</u> • There is no reference plants corresponding to the proposed upper BATAEL • The closest is Plant 223, (150 ug/l) but that cannot form the BATAEL because it includes streams other than just the flue gas treatment stream. • In practice, the upper limit is set by plant 138, with maximum emissions of 142 ug/l • However, plant 138 adds nothing to an upper BATAEL set by plant 456 (64 ug/l) which covers all sampled fuels, the

➢ Zn <u>yearly limit</u>	INCLUDE YEARLY AVERAGE	full range of age, size, operating hours, SO_2 flue gas treatments and WWTP techniques. • **<u>The upper BATAEL should therefore be 64 ug/l (Plant 456)</u>** <u>Daily lower limit</u> • Of the 17 plants sampled, 5 have maximum emissions lower than the proposed lower BATAEL limit, with no grounds for excluding them from the BATAEL • Plant 479 does not have maximum emissions data • However, as its average emissions are lower than the next best performing plant by a factor of >10, it is likely to have maximum emissions lower than the next best performing plant, 122a • Plant 122a has maximum emissions of 12ug/l • **<u>Therefore the lower limit should be <12 ug/l (Plant 122a)</u>** <u>Yearly upper limit</u> • **<u>The upper limit of the yearly Zn BATael should be 35 ug/l (plant 456)</u>** • This includes all sampled types of WWT processes, all fuels, ages, plant sizes (down to 28 MWth) and sampled load factors (down to 2771 hours) <u>Yearly lower limit</u> • Plant 479 has average emissions of 0.25 ug/l • **<u>Therefore the lower limit should be 0.25 ug/l (Plant 479)</u>**

<u>Dioxins and furans</u> • Do not set a BAT-AEL for dioxins and furans.	AGREE	No data has been reported in the TWG survey
1.3 Coal and/or lignite combustion		
1.3.1 BAT 17 – General environmental performance		
• Do not change BAT 17.	DISAGREE regarding FBC	• It is debatable as to whether FBC can be judged to be a BAT technique for coal/lignite • By 2000, the designers of FBC (then) ABB had stopped producing it because of their inability to find uses for the ash etc which is contaminated through the desulphurisation process • It produces high amounts of N_2O, which is a much more potent greenhouse gas than CO_2 • It is also associated with high amounts of HCl and HF
1.3.2.1 BAT 18 – Energy efficiency		
<u>Missing technique</u> • Add a new technique: 'dry bottom ash system' <u>Lignite pre-drying</u> • Keep this technique as emerging.	DISAGREE	• The BP states that although lignite pre-drying systems will soon be commercially available, thus far they have only been under development as an in-house technique • This includes Plant 127 • However, whilst lignite drying there is described as trials, these have been going on for 4 years i.e. plenty of time to be declared commercial ***<u>Note</u>:*** • *Checked with IEA Clean Coal Centre -- as of autumn 2114:* ➢ *RWE's WTA dryer has been demonstrated at commercial scale over shorter periods*

		➢ *Vattenfall's PFBD dryer is still at the pilot scale*
1.3.2.2 Table 10.2 – BAT-AEELs for energy efficiency – coal and/or lignite		
<u>General</u> • Delete: 'whose main purpose is heat/electricity'. • Add a footnote for new plants mentioning that the higher end of the BAT-AEEL range can be achieved with high steam parameters (pressure, temperature).	AGREE	• This describes supercritical combustion, applicable > 40% efficiencies
<u>Plants of ≥ 1000 MWth</u> • Change the proposed net electrical efficiency BAT-AEEL for existing plants to design values of 33.5–44 % for coal-fired plants • and to 33.5–42.5 % for lignite-fired plants.	PUT EFFORTS } INTO } MAINTAINING } FOOTNOTE} IMPROVEMENTS}	***<u>Note</u>:*** • *This <u>describes</u> the range of efficiencies for plants>/= 34% efficiency from the TFEE data cross checked with the Bureau's own 2012 questionnaires. However, we can't just pick the best and demand improvements as we can with pollution abatement – there are inherent plant limits on ability to improve* • *This data was checked by the Bureau considering only plant with a LHV > 6 MJ/kg and commissioned after 1985 and trying to advance that year doesn't help* • *Improvements and qualifications are contained in the footnotes, where we have made progress*
• Change the proposed BAT-AEEL for new plants to design values of 45–46 % for coal-fired plants • and to 42–44 % for lignite-fired plants.	PUT EFFORTS } INTO } MAINTAINING } FOOTNOTE}	***<u>Note</u>:*** • *This <u>describes</u> the range of efficiencies collected by the TFEE for plants >2010 + additional data submitted by TFEE*

	IMPROVEMENTS}	• *This data was checked by the Bureau considering only plant with a LHV > 6 MJ/kg and commissioned after 1985* • *It's difficult to see what we can do about this unless any EEB submissions of better performing plants were omitted*
• Add a footnote mentioning that in the case of plants burning lignite with a LHV < 6 MJ/kg, the lower end of the range is 41.5 %.	DO NOT OPPOSE	• *It is not clear where this data has come from, but it is in our favour to do nothing as the actual data is about 10 % points lower for plants with LHV <6 MJ/kg*
<u>Plants of < 1000 MWth</u> • Existing plants ➢ Change the proposed net electrical efficiency BAT-AEEL for existing plants to design values of 32.5–41.5 % for coal-fired plants ➢ and to 31.5–39.5 % for lignite-fired plants. ➢ Change the proposed net total fuel utilisation BAT-AEEL for existing plants to design values of 75–97 %. ➢ Add a footnote that these levels may not be achievable in the case of an excessively low potential heat demand. • New plants ➢ Keep the BAT-AEEL range proposed in D1 for both coal and lignite firing; change it to as design.	DISAGREE with upper limit	• EEB provided to the TFEE data showing that Shanghai Waigaoiquia untis were upgraded in 2006 to 43.7%
• <u>Footnotes</u> ➢ Remove the reference to the load variations in footnote (1)	AGREE	• Data on the number of operating hours shows mid merit and low base load plants with higher efficiencies than plants operating at high base load levels

➢ (2) Replace 'local conditions' with 'climatic conditions'	AGREE	• The reference to 'local conditions' allowed for confusion between BATAELs and permit BAT set at the local level
➢ (2) and remove the reference to different load modes in footnote	AGREE	• Data on the number of operating hours shows mid merit and low base load plants with higher efficiencies than plants operating at high base load levels • It was particularly inappropriate to refer to peak load and mid merit operation for new plants – were such operation ever to occur, it would be unnecessarily damaging for the emission of pollutants and the achievement of climate change goals.
➢ (2) keep it applicable to new plants.	NO COMMENT	• Climatic conditions affect both new and old plants, and removal of all reference to sub-base load operation for new plants is appropriate. • However, new plants operating on low grade lignite should not happen, although the process does not allow for its removal.
➢ Add to footnote (3): '…depending on the original design of the plant and on the retrofits already performed'.	NO COMMENT	***Note:*** *We do not want to support limitations on a 3% points improvement but maximum improvement may have already been achieved e.g for compliance with previous BREF*
• Reorganise and simplify the BAT-AEELs table ➢ net electrical efficiency and net total fuel		

utilisation BAT-AEELs reported on the same line ➢ footnotes in the heading of the columns mentioning that ○ net electrical efficiency BAT-AEELs apply to power generation only plants and to CHP plants, and ○ 2) net total fuel utilisation BAT-AEELs apply to CHP plants and to heat generation only plants.		
1.3.3 BAT 19 – NOX, CO and NH3 emissions to air **1.3.3.1 BAT conclusion**		
<u>General</u> • Further assess the applicability to emergency-, peak-load and mid-merit-load modes technique by technique depending on available information. Remove the information on typical combination of techniques from the description. <u>Techniques</u> • Complete combustion (a) ➢ Change the technique name to: 'Combustion optimisation'. Remove the information about CFB boilers from the description. • Combination of primary techniques (b) ➢ Do not change the statement. Add in description that the choice and performance of appropriate (combination of) primary techniques may be influenced by the boiler design.		

• SNCR (c) ➢ Change the wording of the description in order to also include lignite-fired plants in the applicability. ➢ Remove the mention of 'SNCR/SCR alone' from the description. ➢ Add an applicability restriction for larger boilers with a high-cross sectional area but without mentioning any plant size threshold as this may vary in the future. ➢ Add an applicability restriction in the case of plants operated in emergency- or peak-load modes with high boiler load variations.	DISAGREE	• The BP shows that any impacts of boiler design and load variations can be offset technically, so it is simply a matter of cost-effectiveness driving this applicability restriction. • However, peak load could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
• SCR (d) ➢ **MISSING POINT! – the BAT conclusions**	AGREE	• Evidence from US plants – and their use to set the new

change the wording to also include lignite – fired plants, but this needs to be agreed		plant BATAEL – proves that SCR is also applicable to lignite-fired plants
➢ Keep the technique generally applicable to plants of < 1000 MWth, down to 100 MWth. ➢ Add in applicability that SCR is not generally applicable to plants of < 100 MWth ➢ and is not applicable to plants of < 300 MWth operated in emergency-load mode,	AGREE DISAGREE	• SCR is used together with primary measures on plant 213 (200 MWth) which operates at mid merit load • No such distinction is made in the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
➢ and more generally that there may be technical and economic restrictions for retrofitting existing plants operated in peak-load modes or existing plants of ≥ 300 MWth operated in emergency-load mode.	DISAGREE	• Peak load could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques

1.3.3.2 Table 10.3 – BAT-AELs for NOX, CO and NH3 – coal and/or lignite 1.3.3.2.1 Table 10.3 – General		
<u>NOX emissions</u> • Assess on a plant size category basis the merit of setting separate BAT-AELs for peak-load or emergency-load plants, and of setting daily averages where not proposed in D1, based on the available information (see Section 1.1.1). <u>CO emissions</u> • Keep BAT-AELs for CO, as yearly averages only. • See further details on proposed BAT-AELs for plant size categories. <u>NH3</u> • Change the proposed BAT-AELs to < 5–10 mg/Nm3 as a general BAT-AEL for all the sizes, with a footnote mentioning that the lower end of the range may correspond to the use of SCR in combination with wet abatement techniques, and the upper end may correspond to the use of SNCR without wet abatement techniques.	DISAGREE AGREE	• Peak load could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators.. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques • This accords with information received by the EEB from Yara: ➢ SCR can achieve emission reductions of up to 99% with NH_3 slip <2-5 mg/Nm^3 ➢ SNCR can achieve 50-60% reductions with NH_3 slip of about 10 mg/Nm^3

• The proposed BAT-AEL for NH3 emissions to air is shown in BAT 4 bis • Change footnote (1) to: `The proposed BAT-AEL for NH3, and NH3 monitoring are only applicable when SNCR and/or SCR techniques are used'. <u>Monitoring</u> • <u>NOX/CO/NH3</u>: ➢ Keep continuous monitoring.	AGREE	• The TWG survey identifies many plants using CEMS for monitoring NOx abatement • CEMS are also common for monitoring CO and occur with NH_3 • Both CO and NH_3 emissions are linked to NOx emissions • It therefore makes sense to require the same monitoring system for all 3 i.e. CEMS
➢ Add a footnote for plants of 50–100 MWth operated in peak-load or in emergency-load modes mentioning the possibility of a minimum monitoring frequency defined as periodic with respectively at least 2 samples/year (peak-load) and at least 1 sample /year (emergency-load).	DISAGREE	• There is only 1 peak load plant in the TWG sample (404) and that uses continuous monitoring
• <u>NH3 slip:</u> ➢ Add a footnote mentioning the possibility to apply periodic monitoring (at least once every	AMEND Remove the	• The EIPPCB assessment states that de-dusting devices

year) when using de-dusting and wet abatement techniques and when the levels of NH3 are well within the proposed BAT-AELs. • Add in the heading of the BAT-AEL for NOX/CO/NH3, in brackets: '…or average over the sampling period'.	references to de-dusting and wet abatement and limit footnote to levels being well within the BATAELS	and wet FGD **<u>may</u>** have very low levels of NH_3 slip at the stack • Where this is not the case, CEMS should be applied • Therefore make periodic monitoring dependent upon there being very low levels of stack NH^3

<u>In the following sub-sections, these amendments have been made to the proposed NOx BATAELs across the different size categories</u>

Plant size (MWth)	EEB BP	New Plant BATAELs ($mgNm^3$)		Existing Plant BATAELs (mg/Nm^3)	
		Yearly	Daily	Yearly	Daily
<100	EEB	100 - 130	155 – 210	100 – 185	165 – 265
	BP	100 – 200	155 – 240	100 – 270	165 – 330
100-300	EEB	</=100	130 – 160	100 – 155	155 – 210
	BP	100 – 150	130 – 175	100 – 180	155 – 210
> 300 coal	EEB	65 – 70	80 – 115	65 – 85	80 – 140
	BP	65 – 85	80 – 125	100 – 150	80 – 200
> 300 lignite and FBC	EEB	60 – 85	80 – 125	50 – 100	140 – 160
	BP	65 - 85	80 - 125	50 - 180	140 - 220

1.3.3.2.2 Table 10.3 – BAT-AELs for NOX, CO and NH3 – plants ≤ 100 MWth

<u>NOX emissions</u> • Keep the proposed yearly BAT-AELs for <u>new</u> plants at 100–200 mg/Nm3	DISAGREE with upper limit	• The proposed upper BATAEL is set by FBC plant 19 (2010) burning lignite with a S-content of 0.9% • However, GF plant 462 (1964) achieves lower emissions

		whilst being considerably older and burning fuel with a slightly higher S-content • Plant 462 should therefore provide the basis of the new plant BATAEL • **<u>The upper yearly new plant BATAEL should therefore be 130 mg/Nm^3 (Plant 462)</u>**
• and 100–270 mg/Nm3 (<u>existing</u>)	DISAGREE with upper limit	• The proposed upper BATAEL is set by GF plant 404 (1985) burning fuel with a fuel S-content of 0.7% • However, GF plant 462 (1964) produces less than half these emissions despite burning fuel with a S-content of 0.92% • Similarly FBC plant 19 (2010) achieves lower emissions than FBC plant 81 (1999) despite burning a significantly higher S fuel (0.9% compared with 0.52%) • Setting the upper BATAEL at Plant 19 will include the better performing plant of each of the two boiler technologies in the sample • **<u>The upper yearly BATAEL for existing plants should therefore be 185 mg/Nm^3 (Plant 19)</u>**
• Propose daily BAT-AELs for <u>existing plants</u>: 165 – 330 mg/Nm3.	DISAGREE with upper limit	• A well run plant should not have an excessive difference between yearly and daily emissions. • The EEB's proposed yearly upper BATAEL is set by Plant 19, which does not provide 95th % ile data • However, neighbouring plants 462 and 81 have differences between their yearly and daily emissions of 35 and 78 mg/Nm^3 respectively • Neither of these is excessive • **<u>Therefore for an upper yearly existing BATAEL of 185</u>**

		mg/Nm^3 the daily BATAEL should be 265 mg/Nm^3
• Propose daily BAT-AELs for new plants: 155–240 mg/Nm3.	DISAGREE with upper limit	• A well run plant should not have an excessive difference between yearly and daily emissions. • The EEB's proposed upper BATAEL is set by plant 462, which has a difference between yearly and daily data of 35 mg/Nm^3 • Plant 81 has a difference of 78 mg/Nm^3 between its yearly and daily data. • Neither of these is excessive • **Therefore for an upper yearly new BATAEL of 130 mg/Nm^3 the daily BATAEL should be 210 mg/Nm^3**
• Add a footnote mentioning that yearly BAT-AELs do not apply when plants operate in peak- or emergency-load modes.	DISAGREE for peak load operation	• The EIPPCB's assessment notes that primary measures can be applied to peak load plants without any different level of environmental performance • Peak load plants could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth • In the US: ➢ Standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100

CO emissions • Change the proposed yearly BAT-AELs to 10–140 mg/Nm3. • Add a footnote mentioning that these BAT-AELs do not apply when plants operate in peak- or emergency-load modes.		hours (Mass) • The BREF is setting Best Available Techniques
1.3.3.2.3 Table 10.3 – BAT-AELs for NOX, CO and NH3 – plants of 100–300 MWth		
NOX emissions • Keep the yearly BAT-AELs proposed in D1. i.e. 100-150 mg/Nm^3 for new plants	DISAGREE with upper limit	• The new German legislation of May 2013 (13, BlmSchV) requires all new plants >100 MWth to meet an ELV of 100 mg/Nm^3 • If a national standard requires it of all plants, then it is not reasonable to have the Best Available Techniques standard exceeding that level • **The new plant upper limit should therefore be </= 100 mg/Nm^3**
• and 100-180 for existing plants	AGREE with upper limit	• The proposed upper BATAEL is set by PC plant 213 (1988) • Despite being fitted with SCR, it is older and has a higher fuel S-content, and therefore produces about the same emissions as the other PC plant 109 • 2 FBC plants perform better than the PC ones, the best performance being due to burning 36% gas. • There is therefore no basis for excluding the proposed reference plant from the BATAEL • **Therefore the upper BATAEL is set at an appropriate level**

		Supporting evidence: *FoI data for Berlin Monbait, 240 MWth, 100% coal:* *Yearly average NOx emissions:* ➢ *2011 – 114.25 mg/Nm^3* ➢ *2012 – 112.44 mg/Nm^3* ***Note:*** *Numerically, the upper BATAEL would be better represented as 175 mg/Nm^3, but as it is based on daily emissions, some allowance is appropriate*
• Propose daily BAT-AELs for existing plants at 155 – 210 mg/Nm3	DO NOT COMMENT	***Note:*** *I cannot justify the BP proposed upper daily limit as it appears too small. However, it is in our interests to keep quiet.*
• and for new plants at 130–175 mg/Nm3	DISAGREE with upper limit	• A well run plant should not have an excessive difference between its yearly and daily emissions • Plants 156 and 25-1 have yearly emissions closest to those of the EEB's proposed upper BATAEL, and they have a difference between yearly and 95th % ile emissions of 58 and 57 mg/Nm^3 respectively. • **The upper daily BATAEL for a plant with a yearly average of 100 mg/Nm^{3}should therefore be 160 mg/Nm^3**
• Add a footnote mentioning that yearly BAT-AELs do not apply when plants operate in peak- or emergency-load modes.	DISAGREE	• The EIPPCB's assessment notes that primary measures can be applies to peak load plants without any different level of environmental performance • Peak load plants could still represent ~ 37% of base load

CO emissions • Change the proposed yearly BAT-AELs to 10 – 140 mg/Nm3. • Add a footnote mentioning that these BAT-AELs do not apply when plants operate in peak- or emergency-load modes.	DISAGREE	operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques • Peak load plants could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours

		(including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
1.3.3.2.4 Table 10.3 – BAT-AELs for NOX, CO and NH3 – plants of > 300 MWth		
<u>NOX emissions</u> • Add a footnote mentioning that yearly BAT-AELs do not apply when plants operate in peak- or emergency-load modes.	DISAGREE for peak load operation	• The EIPPCB's assessment notes that primary measures can be applies to peak load plants without any different level of environmental performance • Peak load plants could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
<u>Lignite-fired plants and coal-fired fluidised bed boilers:</u> • Keep proposed yearly and daily BAT-AELs for <u>existing</u> plants; i.e. 50-180 mg/Nm^3 and 140-220 mg/Nm^3	DISAGREE With both yearly and daily upper	<u>Yearly BATAEL</u> • The BATAEL of 180 mg/Nm^3 is set by plant 117-1 and

	limits	116 • However, there are better performing plants than this which: ➢ are representative of the range of plants included in the BATAEL in terms of boiler type age, size and load factor (including mid merit) ➢ achieve emissions of </= 150 mg/Nm^3 without any secondary abatement • Secondary abatement has not been required of lignite to date because it could meet existing standards without it • However, that is not a proper basis for determining BAT and given the relatively low costs of SNCR, it is reasonable that BAT should require it for all plants • SNCR achieves reductions of 30-50%, resulting in emissions of ~100 mg/Nm^3 • **<u>The yearly existing upper NOx BATAEL for lignite PC and FBC plants should therefore be 100 mg/Nm^3</u>** ***<u>Supporting information</u>:*** *Sandow Unit 5 (581 MWe), 2xCFBC, burning 100% Texas lignite >2009 achieves yearly average emissions of <83 mg/Nm^3 2011, 2012 and 2013* <u>Daily BATAEL</u> • A well run plant should not have a large variation between the yearly average and 95th % ile data • The daily emissions of plants 167 and 170 are excessive compared with similar plants using primary measures –

• Change BAT-AELs for <u>new</u> plants aligning them with the ones proposed for coal firing.	CORRECTION? AGREE with both yearly and daily upper limits	83 and 137 mg/Nm^3 above the yearly average. By comparison, Plants 99, 377 and 123 have 95th %ile data of 60, 35 and 26 mg/Nm^3 respectively above the yearly average • **<u>For a PC yearly upper BATAEL of 100mg/Nm^3 the daily existing upper BATAEL is 160 mg/Nm^3</u>** • The BAT Conclusion Paper appears not to fully align the yearly averages for new plants: ➢ Coal = 65-85 mg/Nm^3 ➢ Lignite and FBC = 50-85 mg/Nm^3 <u>Yearly BATAEL</u> • The EEB welcomes this upper BATael of 85 mg/Nm^3 that explicitly takes account of updated data from lignite PC and FBC plants operating in the US i.e. Oak Grove Units 1 and 2, and Sandow Units 4, 5A and 5B • **<u>This upper BATael of 85 mg/Nm^3 is therefore set at an appropriate level</u>** ***<u>Note</u>:*** *Although these plants would be existing ones under IED, the data provided covers those years used to determine the new plant standard in the BREF. It properly rejects the start-up years that have lower thermal input levels and includes the range of data presented for normal operating years* <u>Daily BATAEL</u> • A well run plant should not have a large variation between the yearly average and 95th % ile data

Coal-fired pulverised combustion boilers: • Change the proposed yearly BAT-AELs for existing plants to 65-150 mg/Nm3	DISAGREE with upper limit	• The upper daily emissions of plants 167 and 170 are excessive in comparison with other plants using other primary measures – Plant 23 is the newest plant and it has 95th %ile data about 40 mg/Nm^3 above the yearly average • **This upper BATAEL of 125 mg/Nm^3 is therefore set at an appropriate level** • This proposal has been achieved by combining the LCPD legal requirement of <500 mg/Nm^3 for primary abatement with 70% removal efficiency for SCR -- the bottom end of the range identified by the Bureau in the BP (69 – 89%) • However, plants regularly achieve below 500 mg/Nm^3 with just primary measures *e.g. Plant 496 (343 mg/Nm^3); Plant 379 (299 mg/Nm^3); Plant 386-2 (196 mg/Nm^3); Plant 406 (358 mg/Nm^3)* • Further, the fact of 70% NOx reduction with SCR does not mean that this is what it can achieve – an operator is not going to run the plant higher than they have to • Assuming a modest SCR emission reduction of 75% with primary measures achieving 350 mg/Nm^3 gives NOx emissions of 88 mg/Nm^3. Similarly, 75% SCR reduction on 300 mg/Nm^3 achieves emissions of 75mg/Nm^3. • Existing plant 141 achieves this, and plants 367, 34 and 253 exceed it

		• **<u>Therefore the upper BAT-AEL limit should be 85 mg/Nm^3 if it is to reflect what plants can achieve (Plant 141).</u>** ***<u>Note</u>:*** *In China, 100 mg/Nm^3 is required of existing plants*
• Change the proposed yearly BAT-AELs for <u>new</u> plants to 65-85 mg/Nm3.	DISAGREE with upper limit	• The Bureau notes that new plants can be expected to achieve emission levels <85% • However, that of itself does not justify setting the upper BATael at 85 mg/Nm^3 i.e. at plant 141 • There are 3 plants performing better with primary measures and SCR – Plants 367, 34 and 253, with NOx emissions of 66, 66 and 69 mg/Nm^3 respectively • These pre-date the normal age range for new plants, but if an older and smaller plant that is otherwise comparable can achieve a particular standard, it is reasonable to expect all new plants to do so. • **<u>Plants 367, 34 and 253 should therefore provide the basis of the BAT-AEL i.e. 70mg/Nm^3.</u>**
• Change the proposed daily BAT-AELs for existing plants to 80-200 mg/Nm3	DISAGREE with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • There is no 95th %ile data for plant 141. The closest comparable plant is for Plants 26, 17, 267 and 268, where the 95th %ile data exceeds the yearly average by 48, 28, 67 and 56 mg/Nm^3 respectively • **<u>For a PC yearly upper BATAEL of 85mg/Nm^3 the daily existing upper BATAEL is 140 mg/Nm^3</u>**

• Keep the proposed daily BAT-AELs proposed in D1 for new plants. i.e. 80-125 mg/Nm^3	DISAGREE with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • There is limited 95th %ile data available for plants achieving a yearly average ~70 mg/Nm^3 with at least 2 primary measures + SCR • Plants 367 and 415-1 have 95th %ile data exceeding the yearly average by ~20 and ~40 mg/Nm^3 respectively • **<u>For a coal PC yearly upper BATAEL of 70 mg/Nm^3 the daily existing upper BATAEL is 110 mg/Nm^3</u>**
• Add a footnote mentioning that the higher end of the daily BAT-AELs is 220 mg/Nm3 in the case of plants operated in peak- or emergency-load modes.	DISAGREE	• Peak load could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
<u>CO emissions</u> • Change the proposed yearly BAT-AELs to < 5–100 mg/Nm3;		

• Add a footnote mentioning that CO emission levels can reach levels up to 140 mg/Nm3 in the case of limitations due to boiler design, and/or in the case of fluidised bed boilers not fitted with secondary techniques for NOX emissions reduction. • Add a footnote mentioning that these BAT-AELs do not apply when plants operate in peak or emergency load mode	DISAGREE	• Peak load plants could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
1.3.4 BAT 20 – N2O emissions to air		
BAT conclusion • Remove BAT 20. • Change the statement of BAT 19 to: 'In order to prevent and/or reduce NOX emissions to air while		

limiting CO and N2O emissions to air from the combustion of coal and/or lignite, BAT is to use one or a combination of the techniques given below.' <u>BAT-AELs</u> • Keep the proposed BAT-AELs. • Change the proposed monitoring frequency to at least once every year. • Add a footnote mentioning that the measurement takes place with a combustion plant load of > 70 %.		
1.3.5 BAT 21 – <u>SOX, HCl, HF</u> emissions to air		
<u>General</u> • Do not change the BAT statement. • Include the CFB scrubber in the list of techniques.		
<u>Techniques</u> • Technique a (fuel choice) ➢ In the description, add 'e.g.' before the example 'down to 0.1 %'. ➢ Add an applicability restriction in the case of plants burning highly specific indigenous fuels (see proposal below). • Technique c (DSI) ➢ Replace 'generally' with 'mostly' in the description of the technique. The same also applies to the SDA technique description. • Techniques e and f (wet and seawater FGD) ➢ Do not modify the size level threshold for the applicability of WFGD. ➢ Include that there may be techno-economic restrictions for applying this technique to	DISAGREE	• However, this could still represent ~ 37% of base load operation each year

plants of < 300 MWth and to plants operated in peak-load mode, and that the technique is not applicable to plants operated in emergency-load mode. • Technique i (gas-gas heater retrofit) ➢ Include the description from Section 5.1.4.5.2 in the table, replacing the word 'retrofit' with 'replacement' in the technique title, delete 'or SDA' in the technique title. ➢ Change the applicability to 'Only applicable to plants fitted with a WFGD and a downstream gas-gas heater when the heat exchanger needs to be changed or replaced'.		• The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
1.3.6 Table 10.5 – BAT-AELs for SOX – coal and/or lignite		
General • Do not change the scope of the BAT conclusions regarding plants covered by IED Article 31. • See detailed assessment of the load modes according		

to the plant sizes. • Propose differentiated BAT-AELs for pulverised combustion (PC) plants of ≥ 300 MWth combusting indigenous fuels with higher SO2 content in the raw flue-gas (see proposal below – point 17).	DISAGREE on: (1) proposed indigenous/non-indigenous differentiation (2) the resulting use of raw flue gas content as the basis for standards	(1) <u>Proposed indigenous/non-indigenous differentiation</u> • The use of raw flue gas content as the basis for setting different standards arises from the inclusion of both coal and lignite (with different LHVs) within the indigenous and non-indigenous categories • This was no part of the Domestic Fuels Initiative and no justification has been provided for the classification of individual plants between these 2 categories • Further, plants burning either indigenous or non-indigenous coals can use coal blending • The differentiation should therefore be on the basis of coal and lignite: ➢ Coal can always be blended ➢ Where lignite is non-indigenous, any blending potential can be taken into account in determining its ability to comply with the general case BATAEL ***<u>Supporting evidence</u>*** • *Representatives of the operators themselves have questioned this, suggesting that several plants have been wrongly categorised* • *Plant 121 already combines ~6% hard coal with indigenous 'Antraxit' hard coal* (2) <u>Use of raw flue gas content as the basis for standards</u> • With coal and lignite in different categories, there is no longer any case for differentiation of standards on the basis of raw flue gas content • Differentiation should therefore be on the basis of fuel S content, with any plant burning fuel with a S-content up

		to 3.25% (dry wt) being required to meet the general case BATAEL
• Keep proposing BAT-AELs in ranges.	AGREE	• Many plants can comply with or considerably exceed the proposed general case BATAEL ranges • There is therefore no general case for desulphurisation rates
• Remove the reference to the sulphur content of the fuel from the BAT statement. • Specify that the SO2 concentration levels in the raw flue-gas are expressed 'under standard conditions' as per the general conditions.	} } } DISAGREE } }	• The separation of coal and lignite into distinct groups removes the need for a differentiation based on raw flue gas content and properly represents the work of the Domestic Fuels Initiative • This reference should remain as two components: ➢ 1 – 3.25% S dry wt ➢ < 1% S dry wt

In the following sub-sections, these amendments have been made to the proposed SOx BATAELs across the different size categories

Plant size (MWth)	**EEB BP**	**New Plant BATAELs ($mgNm^3$)**		**Existing Plant BATAELs (mg/Nm^3)**	
		Yearly	**Daily**	**Yearly**	**Daily**
<100	EEB	150 - 200	ND	150 - 360	170 – 400
	BP	150 - 200	ND	150 - 360	170 - 400
100-300	EEB	80 - 150	ND	80 – 160	135– 250
	BP	80 - 150	ND	80 - 200	135 - 250
>300 coal	EEB	10 - 20	25 - 60	10 – 40	25 – 75
	BP	10 - 75	25 - 110	10 – 130	25 - 205
> 300 lignite	EEB	10 – 20 <1%S	25 – 60 <1%S	10 – 40 <1%S	25 – 75 <1%S

		10 – 75 1-3.25%S	25 – 110 1-3.25%S	10 – 130 1-3.25%S	25 – 205 1-3.25%S
	BP	10 – 75	25 – 110	10 – 130	25 – 205

SO_2: Plants of 50–100 MWth Yearly average		
• Change the proposed yearly BAT-AELs for existing plants of 50–100 MWth to 150– 360 mg/Nm3.	AGREE	• The upper BATAEL is set by Plant 462 • The inclusion of this plant in the BATAEL is necessary as the only reference plant using SDA • **The upper BATAEL is therefore appropriately set at 360 mg/Nm^3 (Plant 462)**
• *New plants?*	IGNORE	***Note:*** *There is nothing to be gained by raising the apparently missing issue of new plant standards. The BATAEL is set by the top performing reference plant, which is the best performing of 3 boiler sorbent injection plants.*
• Add a footnote mentioning that yearly BAT-AELs do not apply when plants operate in peak- or emergency-load modes.	DISAGREE	• The BP justification for not applying the BATAELs to peak load plants is that they are only operating for 1500 hours per year • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx

Daily average • Propose a daily BAT-AEL of 170–400 mg/Nm3 for existing plants. Do not propose a daily BAT-AEL for new plants.		emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques ***Note:*** *The upper daily BATAEL has been set to accord with the 2006 BREF due to lack of data. It would be much worse if based on the reference plant used by the EEB for yearly averages.*
• Keep the proposed continuous monitoring for plants of 50–100 MWth	AGREE	• All but 2 of the reference plants reporting monitoring details already operate continuous monitoring
• Add a footnote for plants of < 100 MWth operated in peak- or in emergency-load modes, setting a minimum monitoring frequency of at least 2 samples/yr (peak-load mode) and at least 1 sample/yr (emergency-load mode).	DISAGREE	• Plant 404 (98 MWth) operates at peak loads with continuous monitoring • The BREF is setting Best Available Techniques • **Continuous monitoring should therefore be required for plants <100 MWth operating at peak load**
SO_2: plants of 100–300 MWth Yearly average		

• Keep the proposed yearly BAT-AELs for <u>existing</u> plants i.e. 80-200 mg/Nm^3 *Yearly new plant average?*	DISAGREE with upper limit	• The proposed upper yearly limit is set by Plant 153-2 on the basis of half-hourly averages (*197 mg/Nm^3*) • This will give a yearly average higher than the normal hourly average basis • A 20% reduction to take account of this would give a yearly upper BATAEL of 157 mg/Nm^3 • This would be supported by FoI 2011 data obtained for DE Mobait (240 MWth hard coal) by German NGOs – yearly average emissions = 152 mg/Nm^3 • **<u>Therefore the upper yearly BATAEL should be 160 mg/Nm^3</u>** ***<u>Note</u>:*** *There is no basis in the data for challenging the upper yearly BATAEL:* • *It is between the 2 top performing plants where:* ➢ *the best plant is daily averages as opposed to half hourly for the second plant* ➢ *and the best plant has a lower fuel S-content*
• Add a footnote mentioning that yearly BAT-AELs do not apply when plants operate in peak- or emergency-load modes.	DISAGREE	• The BP justification for not applying the BATAELs to peak load plants is that they are only operating for 1500 hours per year • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US:

		➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
<u>Daily average</u> • Propose a daily BAT-AEL for <u>existing p</u>lants of 135–250 mg/Nm3. Do not set a daily BAT-AEL for new plants.	AGREE with range	• The range has been derived from limited data but on a sound basis • It is supported by FoI 2011 data obtained for DE Mobait (240 MWth hard coal) by German NGOs – no daily value exceeded 200 mg/Nm^3 • **<u>The BATAEL range is therefore set at an appropriate level</u>** ***<u>Note</u>:*** *There is no room for manoeuvre in the TWG data, and we cannot base a BATAEL on FoI data that does not have a full questionnaire. The most that we can do is use the Mobait data to defend against loosening of the standards*

<u>SO_2: PC boilers of ≥ 300 MWth</u> • Do not create different categories based on size for plants of ≥ 300 MWth.	AGREE	• There is no correlation between plant performance and size >300 MWth in the reference plants relevant to the BATAEL, with the best performing plant (34) being the second smallest.
<u>Yearly average for existing plants</u> • Do not propose specific BAT-AELs for plants operated in mid-merit load mode.	AGREE	• The BP notes plants 435-2, 496 and 101 that are fitted with FGD. • Combining that with the use of low-S fuel (mid-merit plant 268) shows that a mid-merit plant can achieve 40 mg/Nm^3 with a desulphurisation rate of only 80% ***<u>Note</u>:*** *This aims to side-step a potential problem with going for much lower BATAELS – we could trigger a case for separate mid-merit BATAELS*
• For plants operated in peak-load modes, change the higher end of the BAT-AEL range to 220 mg/Nm3 through a footnote. • Add in the applicability the need to assess the applicability for plants operated in peak-load mode on a case-by-case basis	} } DISAGREE } } }	• Peak load could represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques • **<u>Peak load plants should not therefore be treated any</u>**

		<u>differently from other load modes</u>
• and that the technique is not applicable for plants operated in emergency-load mode.		
• Add separate conclusions for plants combusting indigenous fuels with a SO2 content in the raw flue-gas of more than 4350 mg/Nm3 (standard conditions) as a yearly average and that could not achieve the BAT-AEL proposed for techno-economic reasons.	DISAGREE on (2) proposed indigenous/non-indigenous differentiation (2) the resulting use of raw flue gas content as the basis for standards	<u>Proposed indigenous/non-indigenous differentiation</u> • The use of raw flue gas content as the basis for setting different standards arises from the inclusion of both coal and lignite (with different LHVs) within the indigenous and non-indigenous categories • However, no justification has been provided for the classification of individual plants between these 2 categories • Further, plants burning either indigenous or non-indigenous coals can use coal blending • The differentiation should therefore be on the basis of coal and lignite: ➢ Coal can always be blended ➢ Where lignite is non-indigenous, any blending potential can be taken into account in determining its ability to comply with the general case BATAEL ***<u>Supporting evidence</u>*** • *Representatives of the operators themselves have questioned this, suggesting that several plants have been wrongly categorised*

• Set corresponding yearly BAT-AELs for SO2 based on a SO2 reduction efficiency of 97–98.5 % with a higher end of the range that should not exceed 400 mg/Nm3. • Keep the proposed yearly BAT-AEL expressed in concentration for the general case.	AGREE in principle but there should be 2 general cases – coal and lignite	• *Plant 121 already combines ~6% hard coal with indigenous 'Antraxit' hard coal* <u>Use of raw flue gas content as the basis for standards</u> • With coal and lignite in different categories, there is no longer any case for differentiation of standards on the basis of raw flue gas content • Differentiation should therefore be on the basis of fuel S content: any plant burning fuel with a S-content up to 3.25% (dry wt) should be required to meet the general case BATAEL • As is recognised in the BP, coals can be blended much more easily than lignite • Therefore applying the same BATAELs to coal as to lignite results in too low standards for the coal-fired plants • Separate general case BATAELs should therefore be applied <u>Lignite</u> • Plant 170 burns lignite with a dry S-content of 3.22% and achieves emissions of 122 mg/Nm^3 • However, it would be excessive to allow this level of

		emissions to plants with a lower fuel S content • A pro-rata reduction in emissions for plants with a fuel S content of 0.9% would result in a maximum emission of ~38 mg/Nm^3 • This is easily achievable in practice -- Plant 137 dates from 1972, burns lignite with a fuel S content of 0.9% and achieves yearly emissions of 21 mg/Nm^3 based on half hour averages. • **<u>Therefore the general case upper BATAEL for lignite should be:</u>** ➢ **<u>130 mg/Nm^3 for plants burning fuels up to 1-3.25% S</u>** ➢ **<u>40 mg/Nm^3 for plants burning fuels <1% S</u>** <u>Coal</u> • The proposed BATAEL is set by Plant 219, dating back to 1974. • However, there are several existing coal-fired reference plants that currently achieve emissions considerably below this whilst being older – Plants 211 (1965) and 212 (1970) achieve emissions of 56 and 58 mg/Nm^3 respectively • Plant 124b (1968) has yearly emissions of 40 mg/Nm^3 based on half hourly averages • **<u>Therefore the yearly upper SO^2 BATael for existing plants should be 40 mg/Nm^3 (Plant 124b)</u>** ***<u>Supporting evidence regarding the inclusion of the SWFGD plant (493) in the BATAEL</u>:*** • *Plant 493 reports yearly emissions of 121 mg/$Nm^3$with a desulphurisation rate of >94%. However, as this is the*

• Do not introduce a footnote for recently retrofitted plants		*only SWFGD in the sample, there is nothing to suggest that it could not do better and achieve 40 mg/Nm^3:* ➢ *Alstom cite SWFGD removal efficiencies of >98%* ➢ *Up to 99% removal efficiency can be achieved with orifice plate type SWFGD – Dept of Environmental Engineering & Science, National Pingtung University of Science & Technology, Taiwan* ➢ *Fisia Babcock report an older SWFGD at Alba Bahrain with a design removal efficiency of >90% and achieving actual removal of 98% (Power Engineering International 1/7/2004)*
<u>Yearly average for new plants</u> • Keep the proposed yearly BAT-AEL expressed in concentration for the general case.	AGREE in principle but again coal and lignite should have separate BATAELs and tighter than proposed	<u>Coal</u> • Plant 34 has average SO_2 emissions of 9 mg/Nm^3, although no fuel S-content is reported • However, it is known that plant 137 (1972) achieves emissions of 21 mg/Nm^3 (half hourly average) with a fuel S-content of 0.9% • **<u>The new plant upper BATAEL should therefore be 20 mg/nm^3</u>** ***<u>Note</u>:*** *It is necessary to be cautious here. Not only don't we have the fuel S-content of plant 34, but it looks likely that the data has not been corrected to standard conditions* <u>Lignite</u> • The general case BATAEL proposed in the BATAEL for new plants is based on 75 mg/Nm3 emissions

• Add separate conclusions for plants combusting indigenous fuels with a SO2 content in the raw flue-gas of more than 5000 mg/Nm3 (standard conditions) as a yearly average, allowing an alternative BAT-AEL to be derived based on a SO2 reduction efficiency of 98.5–99 % with a higher end of the range that should not exceed 270 mg/Nm3 (idem for FBC plants).		• However, this would be excessive for plants burning fuels with lower S contents • Plants 137, 130 and 116 date from 1972, 1975 and 2003 respectively and all burn lignite with a S-content of 0.9 %. • They achieve emissions of 21, 68 and 77 mg/Nm^3 based on half hourly averages. • If a plant as old as 1972 can achieve can achieve 21 mg/Nm^3 on half hourly averages, then it can be expected of the newest plants • **<u>The upper yearly SOx BATael for new lignite PC plants >300 MWth should therefore be:</u>** ➢ **<u>75 mg/Nm^3 for plants burning fuels up to 1-3.25% S</u>** ➢ **<u>20 mg/Nm^3 for plants burning fuels <1% S</u>** • ***<u>Supporting information</u>*** *– all new plants in key economic regions in China have to meet 35 mg/Nm^3 (hourly average)*
<u>Daily average for existing plants</u> • Change the proposed daily BAT-AEL to 25–205 mg/Nm3 for existing plants combusting non-	AGREE/DISAGREE with upper limit	<u>Lignite</u> • A well run plant should not have a large variation

indigenous fuels.	for the lignite general case DISAGREE with upper limit for coal general case	between the yearly average and 95th % ile data • The yearly BATael for plants with fuel S content 1-3.25% was set by plant 139 • 205 mg/Nm^3 (Plant 388) is the best 95th % ile data for plants in this emissions range • For the yearly BATAEL for plants with a fuel S-content <1% was set by plant 124b, which has a difference of 34 mg/Nm^3 • Plants 124b, 26, 123 and 134 have differences between the yearly and 95th %ile data of 34, 31, 41 and 31 mg/Nm^3 respectively • **Therefore the general case daily upper BATAEL for lignite should be:** ➢ **205 mg/Nm^3 for plants burning fuels up to 1-3.25% S** ➢ **75 mg/Nm^3 for plants burning fuels <1% S** Coal • A well run plant should not have a large variation between the yearly average and 95th % ile data • The yearly BATAEL was set by plant 124b, which has a difference of 34 mg/Nm^3 between the yearly and 95th %ile data • This is not excessive (Plants 26,123 and 134 have differences of 31, 41 and 31 mg/Nm^3 respectively) • **For a yearly upper BATael of 40 mg/Nm^3 the daily upper BATael should therefore be 75 mg/Nm^3.**
• Add in separate conclusions that daily BAT-AELs may not apply to plants combusting indigenous fuels with SO2 concentrations of > 4350 mg/Nm3 (standard		***Note:*** *We are arguing against a differentiation based on raw flue gas content. However, even with a threshold based on fuel S-content, the situation above that threshold is too open-ended to*

conditions) in the raw flue-gas (idem for FBC plants). <u>Daily average for new plants</u> • Keep the proposed BAT-AEL for daily averages for new plants combusting 'conventional' fuels. i.e. 25-110 mg/Nm^3 • Add in separate conclusions that daily BAT-AELs may not apply to plants combusting indigenous fuels with SO2 concentrations of > 5000 mg/Nm3 (standard	DISAGREE with upper limit for both coal and lignite	*allow for the setting of meaningful daily limits* <u>Lignite</u> • A well run plant should not have a large variation between the yearly average and 95th % ile data • The yearly BATael was set by plant 137, with a difference between the daily and yearly data of 47 mg/Nm^3 • Plants 116 has a difference between the daily and yearly data of 36 mg/Nm^3 **<u>The daily upper BATael should therefore be:</u>** ➢ **<u>110 mg/Nm^3 for plants 1-3.25% S content</u>** ➢ **<u>60 mg/Nm^3 for plants <1% S-content</u>** <u>Coal</u> • A well run plant should not have a large variation between the yearly average and 95th % ile data • The top performing yearly average new plant does not provide 95th % ile • Plants 26, 124b and 123 have difference between the daily and yearly data of 32, 34 and 41 mg/Nm^3 respectively • **<u>For a yearly upper BATael of 20 mg/Nm^3 the daily upper BATael should therefore be 60 mg/Nm^3.</u>** ***<u>Note</u>:*** *We are arguing against a differentiation based on raw flue gas content. However, even with a threshold based on fuel S-content, the situation above that threshold is too open-ended to*

conditions) in the raw flue-gas (idem for FBC plants).		*allow for the setting of meaningful daily limits*
<u>FBC boilers of ≥ 300 MWth</u> • <u>Yearly average</u> ➢ Keep the proposed yearly BAT-AELs. ➢ Add separate conclusions for plants combusting indigenous fuels with a SO2 content in the raw flue-gas of more than 5000 mg/Nm3 (standard conditions) as a yearly average and that could not achieve the general BAT-AEL for techno-economic reasons. ➢ Set corresponding yearly BAT-AELs for SO2 based on a SO2 reduction efficiency of 97–98.5 %. ➢ For plants operated in peak- or emergency-load modes, change the higher end of the daily BAT-AEL range to 220 mg/Nm3. • <u>Daily average</u> ➢ Propose daily average BAT-AEL range to 50–220 mg/Nm3 for existing plants combusting 'conventional' fuels ➢ and to 25–185 mg/Nm3 for new plants. • <u>Footnote (1)</u> ➢ Keep the footnote and specify that it applies only to circulating fluidised bed boilers.		
1.3.7 Table 10.6 – <u>BAT-AELs for HCl and HF – coal and/or lignite</u>		
<u>General</u> • Do not set the BAT-AELs based on values from Section		

5.1.4 of the BREF. • Do not change the lower end of the proposed range. • See the detailed proposal below for further information on load mode consideration. • Keep the proposed BAT-AELs for plants even with a stable, low level of HCl/HF emissions. • Revise the proposed BAT-AELs based on the information available on the levels of emission and on the techniques performance for reducing HCl/HF emissions, and taking as contextual information the categories and techniques proposed for SOX emissions.		
• Add a footnote mentioning that the lower end of the range is difficult to achieve for wet FGD with a gas-gas heater.		
<u>HCl Plants ≥ 100 MWth:</u> • keep < 1–5 mg/Nm3 for existing plants	DISAGREE with upper limit	• The proposed BATAEL is set by Plant 18-2 • The HCl emissions of plant 662 (2mg/Nm^3) easily covers all SOx control techniques, fuels, operating hours, plant sizes and ages. • By comparison, setting the BATAEL at 5 mg/Nm^3 would simply duplicate – with less good performance --the type of plants already covered by plant 662 • **<u>The upper yearly limit for the HCl BATael for existing plants >/= 100 MWth should therefore be 2 mg/Nm^3.</u>**

• and change to < 1–3 mg/Nm3 for new plants;	DISAGREE with upper limit	• The proposed BATAEL is set by Plant 479 • Setting the upper BATAEL at Plant 253 easily includes all fuels, plant sizes, operating hours and SOx control techniques relevant to new plants (low-S fuel alone is not appropriate to new plant standards) • **<u>The upper yearly limit for the HCl BATael for new plants >/= 100 MWth should therefore be < 1mg/Nm^3(Plant 253)</u>**
• add a footnote for a higher end of the range at 10 mg/Nm3 in the case of existing CFB boilers and of plants operated in peak- or emergency-load modes.	DISAGREE with upper limit for both CFB boilers and peak load	<u>CFB</u> • EPPSA's data of CFB HCl emissions being in the range of <5 – 10 mg/Nm^3 describes an emission range, but that is not the same thing as determining BAT. • The CFB plants sampled all already achieve emissions much lower than 10 mg/Nm^3, with many (e.g. Plant 390-1, -2, -3, -4, -5 and -6 = 1.6, 1.67, 2.19, 3.1, 1.92 and 1.56 mg/Nm^3 respectively) • **<u>Existing CFBC boilers should therefore have an upper BATAEL of </= 4 mg/Nm^3</u>** <u>Peak load</u> • Peak load could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass)

		• The BREF is setting Best Available Techniques
HCl Plants < 100 MWth: • propose 2–10 mg/Nm3 for existing plants	DISAGREE with upper limit	• The BP determines emissions of plants <100 MWth as being twice those of plants >100 MWth • Therefore on the basis of the EEB's case for plants >100 MWth, **the upper end of the BATael range for existing plants <100 MWth should be 4 mg/Nm^3**
• and < 1–6 mg/Nm3 for new plants.	DISAGREE with upper limit	• The BP determines emissions of plants <100 MWth as being twice those of plants >100 MWth • Therefore on the basis of the EEB's case for plants >100 MWth, **the upper end of the BATael range for new plants <100 MWth should be 2 mg/Nm^3**
HF Plants ≥ 100 MWth: • change to < 0.1–3 mg/Nm3 for existing plants	DISAGREE with upper limit	• The proposed upper limit of 3 mg/Nm^3 is set by Plant 223 • However, setting the upper limit at Plant 444 still includes all fuels and SOx abatement techniques and is comparable regarding the age, size and operating hours • **The upper yearly limit for the HF BATael for existing plants >/= 100 MWth should therefore be 2 mg/Nm^3 (Plant 444)**
• keep < 0.1–2 mg/Nm3 for new plants	DISAGREE with upper limit	• An upper limit of 2 mg/Nm^3 is set by Plant 444 • Setting the upper BATAEL at Plant 221 easily includes all

• add a footnote for plants operated in peak- or emergency-load modes for which the higher end of the range is 6 mg/Nm3.	DISAGREE	fuels, plant sizes, operating hours and SOx control techniques relevant to new plants (low-S fuel alone is not appropriate to new plant standards) • **<u>The upper yearly limit for the HCl BATael for new plants >/= 100 MWth should therefore be 1 mg/Nm^3(Plant 253)</u>** • Peak load could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
<u>HF Plants< 100 MWth:</u> • Change to 0.2–5 mg/Nm3 for existing plants	DISAGREE with upper limit	• The BP determines emissions of plants <100 MWth as being twice those of plants >100 MWth • Therefore on the basis of the EEB's case for plants >100 MWth, **<u>the upper end of the BATael range for existing plants <100 MWth should be 4 mg/Nm^3</u>**
• and < 0.1–3 mg/Nm3 for new plants.	DISAGREE with upper limit	• The BP determines emissions of plants <100 MWth as being twice those of plants >100 MWth • Therefore on the basis of the EEB's case for plants >100 MWth, **<u>the upper end of the BATael range for existing</u>**

		plants <100 MWth should be 2 mg/Nm^3
Monitoring • Keep the minimum measurement frequency of at least 4 times/yr with a footnote allowing its reduction when emissions are proven to be low over the long term, the frequency in that case being at each change of fuel characteristics that may impact the emissions, and at least once/yr.	DISAGREE	• The BP acknowledges that some plants have continuous monitoring, although there is not one predominant type of monitoring • The purpose of the BREF is to set Best Available Techniques, not the predominant technique • The fact that there is no regulations on halogen emissions is not relevant e.g. the BREF is proposing CEMS for Hg for which there is currently no regulation • **BAT is therefore continuous monitoring for plants >100 mg/Nm^3**
• Set a different monitoring frequency for plants of 50–100 MWth operated in peak-load or in emergency-load modes, respectively at least twice and once every year.	DISAGREE	• A lower level of monitoring requirements is generally judged appropriate • **BAT for plants 50-100 mg/Nm^3 is therefore periodic monitoring of 4 times per year**
1.3.8 BAT 22 – Dust and particulate-bound emissions to air		
General • See proposed BAT 1 on EMS for diffuse emissions, and assess the different load regimes based on the techniques applied. Cyclones (a)		

• Remove the technique from the list.	AGREE	• Cyclones are not stand-alone techniques • BAT should therefore be the widely used ESPs or FFs
<u>ESP (b)</u> • Remove the 'two-field' minimum indication in the ESP description.	DISAGREE	• The BP argues that the number of ESP fields is not the only factor affecting ESP performance. • However, it is one influence • 2 fields are common and should therefore be retained as a minimum
<u>Bag filter (c)</u> • Do not limit the applicability of bag filters to only plants of < 300 MWth.	AGREE	• A size limitation of <300 MWth cannot be maintained in the face of the application of FFs to larger sized plants e.g. Plant 662 (543 MWth); Plant 221 (431 MWth); Plant 253 (1420 MWth)
<u>Boiler sorbent injection (d) and dry/semi-dry FGD (e)</u> • Keep the description of the Boiler sorbent injection technique, • Change the range to 'up to 800 MWth' for DSI/SDA techniques. • Change the applicability to 'generally applicable' to match the applicability of these techniques for SOX reduction.		
<u>WFGD (f)</u> • Keep the applicability of WFGD to plants of ≥ 300 MWth. • Include that there may be techno-economic restrictions for applying this technique to plants of < 300 MWth • and to plants operated in peak-load mode • and that the technique is not applicable to plants		

operated in emergency-load mode.		
1.3.9 Table 10.7 – BAT-AELs for dust – coal and/or lignite **1.3.9.1 Table 10.7 – General**		
– General • Do not propose differentiated BAT-AEL levels for mid-merit plants. See further details on the load issue for each category of plant in the following tables.	AGREE	• As the Bureau notes, there are mid-merit plants fitted with dust abatement techniques eg Plant 268, ESP, 2992 operating hours
• Do not split coal and lignite combustion.	AGREE	• Top performing plants include both coal and lignite, with some coal plants burning fuels with a higher ash content than similarly performing lignite plants e.g coal plant 386-2 has a fuel ash content 23.4 wt % raw which is greater than all the lignite plants in that size category (*Plant 389 = 9.6 wt % raw; plant 137 = 5.1 wt % raw; plant 170 = 18.83 wt % raw)*
• Keep the 300–1000 MWth and ≥ 1000 MWth size separation.	AGREE	• D1 Figs 5.26 and 5.27 show different emission profiles according to plant size </> 1000 MWth

<u>In the following sub-sections, these amendments have been made to the proposed dust BATAELs across the different size categories</u>

Plant size (MWth)	EEB BP	New Plant BATAELs ($mgNm^3$)		Existing Plant BATAELs (mg/Nm^3)	
		Yearly	Daily	Yearly	Daily
<100	EEB	2 - 12.5	4 - 16	2 - 20	4 - 28
	BP	2 -15	4 – 20	2 – 20	4 – 28

100-300	EEB	2 - 6	2 – 9	2 – 17	4 – 25
	BP	2 - 10	2 – 20	2 – 20	4 – 25
300-1000	EEB	2 – 3.5	3 – 6.5	2 – 6	3 – 11
	BP	2 - 5	3 – 10	2 – 15	3 – 20
> 1000	EEB	< 2	3 – 4	2 – 3.5	3 – 6
	BP	<2 - 5	3 - 10	2 - 10	3 - 16

Note: *The BP appears to have the lower limit of the new plant daily BATAEL out of the proper sequence of decreasing emissions with increasing size. However, it is not in our interests to do anything about this.*

1.3.9.2 Table 10.7 – BAT-AELs for dust – plants of < 300 MWth

Dust: plants of 50–100 MWth • Existing plants yearly average ➢ Keep the proposed yearly BAT-AELs of 2–20 mg/Nm3 for plants of 50–100 MWth –		***Note:*** *There is a lack of data to counter this (questionnaires for plants >1000 reference number are not provided, so no ash or age data for key plants)*
➢ Add a footnote mentioning that yearly BAT-AELs do not apply to peak- and emergency-load modes for plants of 50–100 MWth.		• The BP acknowledges that the same techniques can be applied as for other load modes, but suggests not applying the BATAELs to peak load plants in that they are only operating for 1500 hours per year • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US:

		➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
• <u>New plants daily average</u> ➢ Propose a daily BAT-AEL of 4–20 mg/Nm3 for new 50–100 MWth plants,	DISAGREE with upper limit	• No rationale is provided in the BP as to how this BATAEL was determined and there is no reference plant that accords with it • The EEB has proposed Plant 19 as the reference plant for the upper BATAEL, but this has neither 95th % ile or maximum data • A well run plant should not have an excessive difference between the yearly average and 95th % ile data • Plant 1015 has the next highest yearly average, no 95th %ile data but maximum emissions of 16 mg/Nm^3 • **<u>The upper daily BATAEL for new plants should therefore not be >16 mg/Nm^3 (Plant 1015)</u>**
• <u>New plants yearly average</u> ➢ Keep the proposed lower end of the ranges at 2 mg/Nm3.		
➢ **<u>NEW POINT</u>** – new plant upper end of yearly range (currently 15 mg/Nm^3)	DISAGREE with	• There is no reference plant that accords with an upper BATAL of 15 mg/Nm^3

	upper limit	• Plant 19 was commissioned in 2010, has a raw ash content of 15.1% wt and average dust emissions of 12.5 mg/Nm^3 • An upper BATAEL set at that level would include the same range of abatement techniques as the BP proposal • **<u>The upper new plant BATAEL should therefore be 12.5 mg/Nm^3 (Plant 19)</u>**
• <u>Monitoring frequency</u> ➢ Keep continuous monitoring for plants of ≥ 50 MWth.	AGREE	• Most of the reference plants in the sample already operate continuous measurement
➢ Add a footnote for plants of 50–100 MWth operated in peak-load or in emergency-load modes mentioning the possibility of a minimum monitoring frequency defined as periodic with at least two samples/yr (peak-load) and at least one sample/yr (emergency-load) respectively.	DISAGREE	• Peak load plant 404 already operates continuous measurement • We are setting <u>Best</u> Available Techniques
<u>Dust: plants of 100–300 MWth</u> • <u>Existing plants - yearly and daily averages</u> ➢ Keep the proposed yearly BATAELs (2-20 mg/Nm^3)	DISAGREE	• The proposed upper BATAEL is set by Plant 379 • However, Plant 381 performs better despite being older and has a fuel dust content more than twice that of Plant 379 (*21.31% compared to 10.41 dry wt*) • A BATAEL set by this plant would still cover the same range of abatement techniques

		• **<u>The upper BATAEL for existing plants should therefore be 17 mg/Nm^3(Plant 381)</u>**
➢ and daily BAT-AELs for existing plants. (upper = 25 mg/Nm^3)	DO NOT CHALLENGE	***<u>Note</u>:*** *It is difficult to see how they have arrived at this figure, but it is in our favour*
➢ Add a footnote mentioning that yearly BAT-AELs do not apply to peak- or emergency-load modes.	DISAGREE	• The BP acknowledges that the same techniques can be applied as for other load modes, but suggests not applying the BATAELs to peak load plants in that they are only operating for 1500 hours per year • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
• <u>New plants - yearly average</u> ➢ Keep the proposed yearly BAT-AELs for new	DISAGREE	• There is no reference plant for an upper BATAEL of 10

plants. (2-10 mg/Nm^3)	with upper limit	mg/Nm^3 – the nearest plant within that range is 153-2 (2009) with emissions of 8.2 mg/Nm^3 • However, Plant 22-1 (2000, retrofitted 2006) achieves emissions of 5.4 mg/Nm^3 whilst burning fuel with a higher ash content (*14.7 compared to 9.9 % dry wt*). • A BATAEL set at this level would still include a wide range of abatement techniques • **<u>The upper BATAEL should therefore be 6 mg/Nm^3 (Plant 22-1)</u>**
• <u>New plants - daily average</u> ➢ Propose a new daily BAT-AEL of 2–20 mg/Nm3 for new plants.	DISAGREE with upper limit	• The upper yearly BATAEL proposed by the EEB is set by plant 22-1 • Plant 22-1 has 95th % ile data of 9 mg/Nm^3 • **<u>Therefore the upper daily BATAEL should be 9 mg/Nm^3</u>**
1.3.9.3 Table 10.7 – BAT-AELs for dust – plants of > 300 MWth		
<u>Dust: plants of 300–1000 MWth</u> • <u>Existing plants yearly average</u> ➢ Change the proposed yearly BAT-AELs for existing plants to 2–15 mg/Nm3.	DISAGREE with upper value	• The D1 proposal is set by plant 386-2 • However, setting the BATael at plant 386-3 equally includes all relevant types of FGD and dust abatement (*ESP alone cannot be BAT for plants of this size, which require FGD)* • It does not explicitly include lignite plants, but its fuel ash content (23.4 wt % raw) is the same as plant 386-2, and greater than all the lignite plants (*Plant 389 = 9.6 wt % raw; plant 137 = 5.1 wt % raw; plant 170 = 18.83 wt % raw*) • **<u>The upper BATael should therefore be 6 mg/Nm^3 (Plant 386-3)</u>** **RED LINE** ***<u>Supporting information</u>:*** *Plants in Chinese key economic*

		regions have to reach 5 mg/Nm^3 through retrofit
➢ Add a footnote mentioning that yearly BAT-AELs do not apply to peak- and emergency-load modes.	DISAGREE for peak load operation	• Peak load plants could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
• Existing plants daily average ➢ Change the proposed daily BAT-AELs for existing plants to 3–20 mg/Nm3.	DISAGREE with upper value	• A well run plant should not have a large variation between the yearly average and 95th % ile data • The EEB's proposed yearly BATael was set by Plant 386-3, which does not report any 95th %ile data • However the very similar plant 415-2 has 95th % ile data that is 5 mg/Nm^3 higher than the yearly average • **For a yearly upper BATael of 6 mg/Nm^3 the daily upper BATael should therefore be 11 mg/Nm^3.**

• <u>New plants yearly average</u> ➢ Change the proposed yearly BAT-AELs for new plants to 2–5 mg/Nm3.	DISAGREE with upper value	• The D1 proposed new plant upper BATael is set by plant 662 dating back to 1986, using a fuel with raw ash content of 13.37% wt. • Plant 443-1 burns a fuel with a higher raw ash content of 15.77% wt (age unknown) and is representative of the dataset and a range of abatement techniques. • **<u>Therefore the upper limit of the yearly dust BATael for new plants 300-1000 MWth should be 3.5 mg/Nm^3 (plant 443-1)</u>**
• <u>New plants daily average</u> ➢ Propose daily BAT-AELs for new plants: 3–10 mg/Nm3.	DISAGREE with upper value	• A well run plant should not have a large variation between the yearly average and 95th % ile data • The EEB's proposed yearly BATael was set by Plant 443-1, which has 95th %ile data 4.6 mg/Nm^3 above the yearly average • Very similar plants 415-1 and 134 have 95th % ile data that is up to 3 mg/Nm^3 higher than the yearly average • **<u>For a yearly upper BATael of 3.5 mg/Nm^3 the daily upper BATael should therefore be 6.5 mg/Nm^3.</u>**
<u>Dust: plants of ≥ 1000 MWth</u> • <u>Existing plants yearly average</u> ➢ Change the proposed yearly BAT-AELs for existing plants to 2–10 mg/Nm3.	DISAGREE with upper value	• There is no reference plant at 10 mg/Nm^3 – the plants with the highest emissions within that range are plants 128-1 and 129-2 at 8.6 mg/Nm^3, both commissioned in the 1980s • Plant 496 dates back to the late 1960s, burns fuel with a raw ash content of 12.2% wt, and operates at mid merit loads. Setting the BATael at this plant includes both bag

➢ Add a footnote mentioning that yearly BAT-AELs do not apply to peak- and emergency-load modes.	DISAGREE	filters and ESPs with FGD, and both coal and lignite. • **<u>The upper BATael should therefore be 3.5 mg/Nm^3 (Plant 496)</u>** ***<u>Note</u>:*** *The revised graphs no longer contain the reference plant that gave an upper limit of 3 mg/Nm^3. This argument falls back on the inclusion of both coal and lignite plants and ignores the fact that plants 388 and 24 have fuel ash contents outside those covered by the proposed BATael range – 21.86 wt % raw and 23.978 wt % raw respectively. If challenged on this, we have to 'retreat' to an upper BATael = 6 mg/Nm^3 (Plant 388)* • The BP justification for not applying the BATAELs to peak load plants is that they are only operating for 1500 hours per year • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass)

		• The BREF is setting <u>Best</u> Available Techniques
• <u>Existing plants daily average</u> ➢ Change the proposed daily BAT-AEL for existing plants to 3–16 mg/Nm3.	DISAGREE with upper value	• A well run plant should not have a large variation between the yearly average and 95th % ile data • The EEB's proposed yearly BATael is set by plant 496, which reports no 95th % ile data • However, neighbouring plants 127-1 and 116 have similar levels of yearly emissions and 95th % ile data 0.1 and 0.65 mg/Nm^3 higher than their respective yearly emissions • Plants 130 and 122b have differences of 1.82 and 2.4mg/Nm^3 between their average and 95th %ile data • **<u>For a yearly upper BATael of 3.5 mg/Nm^3 the daily upper BATael should therefore be 6 mg/Nm^3.</u>**
• <u>New plants yearly average</u> ➢ Change the proposed yearly BAT-AEL for new plants to < 2–5 mg/Nm3.	DISAGREE with upper value	• The D1 proposal is set at plant 77, commissioned in 1983 – not new plant age • However, Plant 253 (2008) burns fuel with a higher ash content (12.4 compared to 12.2 % wt raw) and achieves emissions of 1.6 mg/Nm^3 • It is also representative in terms of size and operating hours. • **<u>The BATael should therefore be set by plant 253 at 2 mg/Nm^3, resulting in an overall new plant yearly BATAEL of <2 mg/Nm^3</u>**
• <u>New plants daily average</u> ➢ Change the proposed daily BAT-AEL for new plants to 3–10 mg/Nm3.	DISAGREE with	• A well run plant should not have a large variation between the yearly average and 95th % ile data

	upper value	• The EEB's proposed yearly BATael is set by Plant 253, which does not report 95th % ile data • Neighbouring plant 122a reports 95th % ile data of 1.8 mg/Nm3 above its average • **For a yearly upper BATael of 2 mg/Nm3 the daily upper BATael should therefore be 4 mg/Nm3.**
Monitoring • Change the lower ends of the ranges to '(<) 2 mg/Nm3' when the lower end of the ranges are equal to or below 2 mg/Nm3.		
1.3.10 BAT 23 – Mercury emissions to air		
General • Keep the proposed list of techniques. • Keep the techniques generally applicable for plants of < 100 MWth.	AGREE } AGREE }	• The EEB has submitted extensively on both these points, including the relatively low and dose-sensitive costs of Hg-specific abatement
• Align the applicability of the techniques proposed as co-benefit with the applicability in the sections where they are proposed as main technique.	AGREE	• Noting the co-benefit impact of these techniques on other pollutants is an important component in assessing their environmental impact and cost effectiveness
Do not limit the applicability of bag filters (technique a) only to plants of < 300 MWth.	AGREE	• Bag filters operate successfully on plants significantly larger than 300 MWth, as is evident from the graphs of reference plants
SCR (c) • Keep the technique generally applicable to plants of < 1000 MWth, down to 100 MWth. • Add in applicability that the technique is not generally	AGREE } AGREE }	• This accords with the applicability criteria set out in earlier NOx sections and the acceptance of SCR as BAT for

applicable to plants of < 100 MWth, that there may be technical and economic restrictions for retrofitting existing plants operated in peak-load mode and plants of ≥ 300 MWth operated in emergency-load mode.		lignite -- there is no case for changing this with regards to the co-benefit impacts on Hg ***Note**: In D1, applicability for lignite is limited to plants >300 MWth, so this is an advance*
• Do not add further description.	DISAGREE	• Make particular mention of catalysts (such as TRAC) which optimise abatement of NOx and Hg – see EEB technical submissions at data collection stage
<u>Fuel choice (e)</u> • Change the description to 'Select a fuel with low Hg content'.	AGREE	• Setting limits as to Hg content is not necessary for the implementation of this technique and does not accord with practice regarding other pollutants e.g. S for coal or S/Ni/Va for petcoke
• Do not add a special applicability restriction for lignite combustion.	AGREE	• This already covered by an applicability restriction linked to the energy policy of the MS
<u>Carbon sorbent injection (f)</u> • Keep the applicability unchanged and add to the description: 'the use of this technique may require additional treatment steps to further segregate the mercury-containing carbon fraction prior to further reuse'. • Do not limit the applicability only to plants of ≥ 100 MWth.	AGREE] } } AGREE]	• The EEB has submitted extensively on this technique, including updates on the commercial use of concrete-friendly sorbents and hydrocyclones that concentrate the mercury in a small fraction of the WWTP sludge • The EEB has also submitted on the relatively low costs of this technique and the fact that they are dose sensitive, making the technique suitable for use with small plants and small amounts of additional Hg removal
<u>Halogenated techniques (g)</u> • Do not set an applicability restriction for plants of <	AGREE	

100 MWth. • Add the following applicability constraint: 'Applicable within the constraints associated with the corrosion potential of equipment. • Name 'brominated additives' in the description of the technique. <u>Fuel pre-treatment (h):</u> do not remove the technique.	AGREE	• The EEB has submitted on the relatively low costs of this technique and the fact that they are dose sensitive, making the technique suitable for use with small plants and small amounts of additional Hg removal • The EEB provided original material on this technique and supplementary information in response to Bureau queries • This material supports the inclusion of fuel pre-treatment as a technique
1.3.11 Tables 10.8 and 10.9 – BAT-AELs for mercury – coal and/or lignite **1.3.11.1 Tables 10.8 and 10.9 – General**		
• Monitoring ➢ Keep the continuous monitoring of Hg for plants of ≥ 300 MWth. Add a footnote allowing the monitoring frequency to be reduced when emissions are proven to be low over the long term, the frequency in that case being at each change of fuel characteristics that may impact the emissions, and at least twice/yr. ➢ For plants of < 300 MWth, keep the monitoring frequency of 4 times/yr and add a footnote allowing its reduction when emissions are proven to be low over the long	AGREE AGREE	• The EEB has submitted details of continuous monitoring of Hg being specified in the US • There is also some continuous monitoring already undertaken in the EU • Some reference plants < 300 MWth already monitor 4 x per year ***<u>Note</u>:*** *There is no basis in the data for going tougher than this*

term, the frequency in that case being at each change of fuel characteristics that may impact the emissions, and at least once/yr.		
• Group all the coal-fired plants together, splitting them only by plant size and not by coal subcategories. Distinguish between BAT-AELs for 'coal-fired plants' and BAT-AELs for 'lignite-fired plants'.	AGREE	• It is appropriate to separate coal and lignite plants because the latter have lower halogen contents and therefore higher amounts of elemental Hg that is not water soluble and does not therefore get captured by the FGD • Therefore more specific Hg abatement is required to enable the elemental Hg to be oxidised and captured by the FGD
• Keep BAT-AELs for mercury emissions to air except for plants < 300 MWth operated in peak- or emergency-load modes.		• The BP rationale for this is that these plants may operate less effective or no related techniques for co-benefit abatement • However, it has been argued that there should be no differentiation for peak load plants for the pollutants that provide co-benefit abatement for Hg. • **<u>Therefore there should be no distinction for peak load plants for Hg</u>**
• Set '< 1 µg/Nm3' as the lower end of the BAT-AEL ranges for mercury emissions to air.	**<u>DISAGREE</u>!!**	• There are 17 coal reference plants reporting emissions <1 ug/Nm^3, including 7 plants <300 MWth • Not differentiating <1 ug/Nm^3 would negate the US new plant standard for coal that all plants have to comply with **RED LINE**

		***Note**: 0.31 ug/Nm^{3}as of 2013(Vosteen Consulting)*
• Keep using ranges to express the BAT-AELs.	AGREE	• This is the basis of Hg controls in the US, China and Germany. • It is also required by the BREF Guidance Document
1.3.11.2 Table 10.8 – BAT-AELs for mercury – coal		
<u>Plants of < 300 MWth</u> • Change the BAT-AELs for existing plants to 1–9 µg/Nm3 as an average over the year.	DISAGREE with upper limit	• The upper BATAEL is set by Plant 690 (2006) burning sub-bituminous coal but the inclusion of additional plants in the database justifies the revision of this upper BATAEL. • Plants burning sub-bituminous coals are of particular interest, as they have higher amounts of elemental mercury that is not removed by co-benefit abatement. • There are older plants burning 100% sub-bituminous fuels that achieve lower emissions e.g. Plant 683 with Hg emissions of 3.1 ug/Nm^3 plus several others with even lower emissions • Further, these emissions have been achieved without the use of the Hg-specific abatement techniques that have been accepted as BAT • **<u>Therefore the upper BATAEL should be 3.5 ug/Nm^3 (Plant 683)</u>**
• Keep the proposed BAT-AELs for new plants unchanged. (0.5 – 5 ug/Nm^3)	DISAGREE with upper limit	• The proposed upper BATAEL is set by Plants 687 and 688, both of which burn at least 50% sub-bituminous coal • Plants burning sub-bituminous coals are of particular interest as they have higher amounts of elemental mercury that is not removed by co-benefit abatement • However, Plants 286 (retrofitted 2002) and 689 (2004) have Hg emissions of 0.57 and 0.6 ug/Nm^3 respectively

Plants of ≥ 300 MWth • Change the BAT-AELs to 1–4 µg/Nm3 for existing plants	DISAGREE with upper limit	• **The upper BATAEL should therefore be 0.6 ug/Nm^3** • The proposed upper limit of 4 ug/Nm^{3}reflects the EEB's position at the D1 consultation • However, since then 2 things have changed ➢ Confirmation of the commercial operation of related techniques -- such as concrete-friendly ACI and separation of Hg in WWTP sludge -- necessitates less of a margin being left between EU and US standards ➢ Additional data such as age, operating hours, size etc can inform decisions on BAT within groups of plants • The proposed upper BATAEL is set by Plant 134 – SCR-WFGD-ESP – burning bituminous coal and based on half hourly averages which will overestimate the actual emissions • However, this adds nothing compared to a BATAEL set at Plant 212, which includes all sampled combinations of SOx/NOx/dust abatement and is representative of the whole sample in terms of plant age, size and operating hours. • These emissions have been achieved by co-benefit abatement alone, and mercury-specific abatement techniques have been accepted as BAT if required. • **The BAT-AEL should therefore be 1.5ug/Nm3 (Plant 212b)** ***Supporting evidence:*** *The (limited) data available on fuel Hg content shows that the achievement of low Hg emissions does not depend upon low fuel Hg content – plants are independently*

		achieving these levels
• and to 1–2 µg/Nm3 for new plants as yearly averages.	DISAGREE with both upper and lower limits	• The top performing plants all pre-date the usual 2008 cut-off date for new plants, but if they can achieve higher levels of abatement, then it is reasonable to use them to set the BATAEL • The BAT-AEL should be set at plant 662-268-267 which: ➢ covers the full range of plant sizes, and the range of abatement technique constellations ➢ has 2 operating at mid-merit ➢ and despite dating back to 1986 or 2004 retrofits, have lower emissions than Plant 253 which dates from 2008 • They achieve emissions of 0.5 micrograms/Nm^3 by co-benefit abatement alone, and mercury-specific abatement techniques have been accepted as BAT and are available if required. • **<u>Plant 662-268-267 should therefore provide the basis of the BAT-AEL i.e. =/< 0.5 µg/Nm^3</u>** ***<u>Supporting evidence</u>:*** *The (limited) data available on fuel Hg content shows that the achievement of low Hg emissions does not depend upon low fuel Hg content – plants are independently achieving these levels*
1.3.11.3 Table 10.9 – BAT-AELs for mercury – lignite		
<u>Plants of < 300 MWth</u> • Change the BAT-AELs for existing plants to 2–10 µg/Nm3	DISAGREE with upper limit	• There is no reference plant for an upper BATAEL of 10 ug/Nm^3 – the nearest is plant 22-1 with Hg emissions of

		6.7 ug/Nm^3 but burning only 60% lignite, with 40% wood. • Lignite is the fuel of particular interest because it has a high level of elemental mercury which more difficult to abate by co-benefit. • Plant 19 is newer than Plant 22-1 but burns 100% lignite, and therefore provides a proper basis for the upper BATAEL • **<u>The upper BATAEL for existing lignite plants < 300 MWth should therefore be 3.5 ug/nm^3</u>**
• and to 1–7 µg/Nm3 for new plants.	DISAGREE with upper limit	• Plant 25-1 burns 100% lignite, is the oldest of the plants in this size category (1996, 1997) and is still one of the best performers. • If this plant can achieve emissions of 1 ug/Nm^3, then this should be the new plant standard • This is especially the case when this has been achieved without using Hg-specific abatement, which is available as a BAT technique • **<u>The upper BATAEL for new lignite plants <300 MWth should therefore be </=1 ug/Nm^3 (Plant 25-1)</u>**
<u>Plants of ≥ 300 MWth</u> • Change the BAT-AELs for existing plants to 1–10 µg/Nm3	DISAGREE with upper limit	• There is no plant according with the proposed BATAEL, but 6 related units at 1 complex all emit 9 mg/Nm^3(at Plants 128/129) • However these related units increase the BATAEL by ~50% compared with that set by the other 14 plants. • Further, setting an upper BATAEL of 9 ug/Nm^3 adds nothing to one set by plants 130 and 137 • Plants 130 and 137 are existing retrofitted plants dating

• and to 1–4 µg/Nm3 for new plants.	DISAGREE with both upper and lower limits	back to 1976 and 1972 respectively. • They achieve emissions of 3 micrograms/Nm^3 by co-benefit abatement alone, and mercury-specific abatement techniques have been accepted as BAT and are available if required. • **<u>The upper yearly Hg BAT-AEL for existing lignite plants >300 MWth should therefore be 3µg/Nm^3 (Plants 130 and 137)</u>** ***<u>Supporting evidence</u>:*** *The (limited) data available on fuel Hg content shows that the achievement of low Hg emissions does not depend upon low fuel Hg content – plants are independently achieving these levels* • Plant 18-2 emits <1 ug/Nm^3, by co-benefit abatement • Plant 25-1 achieves emissions of 1 ug/Nm^3 despite being only 144 MWth • Mercury-specific abatement techniques have been accepted as BAT and are available if required to supplement co-benefit abatement • Data submitted by the EEB on the lignite fired US Oak Grove Units 1 and 2 show that Hg emissions are kept below 1µg/Nm^3 with the use of ACI • **<u>BAT can be based on plants anywhere in the world, so the BAT-AEL for lignite should be set at </= 1µg/Nm^3</u>** ***<u>Supporting evidence</u>:*** *The (limited) data available on fuel Hg content shows that the achievement of low Hg emissions does not depend upon low fuel Hg content – plants are independently achieving these levels*

1.4 Biomass and peat combustion **1.4.1.1 General issues**		
• Do not include specific sections for BFB and CFB boilers in the BREF and in the BAT conclusions.	AGREE	• The data includes FBC along with PC without any grounds for differentiation
• Propose BAT-AELs for both new and existing plants.	AGREE	• Some plants are decades old and it is reasonable that more is required of new plants
• Do not include specific sections on woody biomass, herbaceous biomass and peat in the BREF and in the BAT conclusions.	MOSTLY AGREE	• The data has too many sub-categories and combinations of sub-categories to allow for meaningful BATAELS to be specified for all the sub-categories • However, on rare occasions, 1 plant of 1 sub-category is exerting such a disproportional effect on the BATAEL that a separate note can be justified – as proposed in Section 1.4.3.2.1, p.90 of the BP
• Do not include a specific section covering plants that converted from coal to biomass in the BREF and in the BAT conclusions.	AGREE	• In section 10 of the questionnaire, other plants report conversions e.g. from oil to coal, and these are not subject to special consideration
1.4.2 BAT 25 – Energy efficiency **1.4.2.1 BAT 25 – Energy efficiency**		
• Remove techniques (a) and (b) from BAT 25. • As a consequence, BAT 25 becomes redundant and it is proposed to delete it. Change 'Fuel drying' technique in Section 10.8 of the BAT conclusions to 'Fuel predrying'.		

• Keep proposing BAT- AEELs for the combustion of solid biomass and/or peat		
1.4.2.2 Table 10.10 – BAT-AEELs for energy efficiency – solid biomass and/or peat		
• Add a footnote indicating that the BAT-AEELs do not apply in the case of plants operated in peak- or emergency-load modes.	DO NOT OPPOSE	***Note:*** *There is no evidence in the data to refute this, and energy efficiency is one area where the stopping and starting of lower load modes does affect overall efficiency*
<u>Net total fuel utilisation</u> • Change the proposed BAT-AEEL for new and existing plants to design values	AGREE	• Standardising the data makes it much more meaningful • The Bureau has checked the TFEE work on this and introduced the design efficiency of Plant 190 where TFEE data was judged not to properly reflect the best performance ***Note:*** *This accords with my own assessment at the time of the TFEE that top performing plants were missing.*
1.4.3 BAT 26 – NOX, NH3 and CO emissions to air **1.4.3.1 BAT conclusion**		
<u>General</u> • Do not add for the all techniques a general applicability restriction to existing plants.	AGREE	• The Bureau cites examples of plants showing that retrofitting of existing plants already occurs • Maximising the retrofitting of existing plants is essential if BAT is to be properly expressed
• Do not include the technique 'Hybrid SCR/SNCR' in the list of BAT.	AGREE	• This is covered by the BAT 26 stipulation that individual techniques can be used in combination to achieve the BATAEL • No evidence has been presented that there is anything

		distinctive about the combination as opposed to SCR = SNCR ***<u>Note</u>:*** *This is potentially very important and therefore a <u>red line</u> for the EEB. It is not clear who made this proposal for SCR/SNCR as a specific combination, but it could be underpinning the known industry attempts to fit a bit of SCR and then average the higher emissions over the other units at a plan.*
• Add the technique 'Combustion optimisation' in the list of BAT.	AGREE	• Measures such as combustion optimisation prevent pollution • IED prioritises the prevention of pollution over its control (Preamble 2)
• Change the name of the technique 'Air staging combustion' to 'Air staging'.	AGREE	• This is a simple matter of ensuring consistency throughout the document
<u>Techniques</u> • (Advanced) low-NOX burners (a) ➢ Keep the technique's applicability as generally applicable.	AGREE	• The Bureau has cited Plants 423 and 125 as showing that low-NOx burners are applicable to both CFBC and BFBC • LNBs are preventative measures, which preamble 2 of the IED prioritises over the control of pollution
➢ Change the name of the technique to 'Low-NOX burners (LNB)'.	QUALIFIED AGREEMENT	• The name should be consistent throughout the document • However, losing the prefix of 'advanced' should not be taken as any indication of a lowering of standards

• Fuel staging (reburning) (c) ➢ Keep the technique's applicability as generally applicable.	AGREE	• The Bureau has cited Plants 378, 188 and 13 as showing that low-NOx burners are widely applicable across FBC • LNBs are preventative measures, which preamble 2 of the IED prioritises over the control of pollution
➢ Change the name of the technique 'Fuel staging (reburning)' to 'Fuel staging'.	AGREE	• The name should be consistent throughout the document
• Flue-gas recirculation (d) ➢ Change the applicability of the technique to generally applicable and modify the description in Section 10.8 of the BAT conclusions.	AGREE	• The Bureau has cited Plants 455, 14, 473 and 453 as showing that low-NOx burners are widely applicable across FBC • LNBs are preventative measures, which preamble 2 of the IED prioritises over the control of pollution. Their use must therefore be maximised
• SCR (e) ➢ Add in the description of the technique that the use of high-alkali fuels may require installing SCR after the dust abatement system.	QUALIFIED AGREEMENT	• This point is correct in principle, but is it not already covered by the D1 text? ***Note**: This is a valid query, but it doesn't really matter how this underlying (correct) point is expressed*
➢ Add an applicability restriction for plants operating in emergency-load mode. ➢ Add an applicability restriction for the retrofit of existing plants operating in peak-load mode.	DISAGREE	• Peak load operation could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used,

		thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
➢ Add an applicability restriction for plants of <100 MWth. • SNCR (f) ➢ Add an applicability restriction in the case of plants operated in emergency- or peak-load modes with highly variable boiler loads.	DISAGREE	• Peak load plants could still represent ~ 37% of base load operation each year • The Bureau's assessment notes that the effect of varying loads can be offset by using SNCR in combination with a slip catalyst, but that this may not be cost-effective for emergency and peak load plants • In the absence of clear evidence that this is the general case, SNCR + slip catalyst should be specified for peak load plants and if there are applications where it is not economic, these should be made in detail at the permitting stage • In the US, no differentiation would be made for peak load plants: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100

		hours (Mass) • The BREF is setting Best Available Techniques
1.4.3.2 Table 10.11 – BAT-AELs for NOX, CO and NH3 – solid biomass and/or peat **1.4.3.2.1 Table 10.11 – General**		
• Load factors ➢ Do not add new categories for existing plants operating at low load factors. • Load modes ➢ Do not include new categories depending on the load mode operation but include the proposals through footnotes for each pollutant. • Fuels ➢ Keep the structure of the table by plant size and consider including fuel specificities through footnotes, if deemed necessary. • N_2O ➢ Remove BAT 27. Change the in the statement of BAT 26 that the techniques given are to prevent and/or reduce NOX emissions to air while limiting CO and N2O emissions to air. ➢ Do not add BAT-AELs for N2O emissions.	AGREE AGREE AGREE	• As the Bureau notes in its assessment, there is no clear correlation between emissions and load factor • There are plants with lower operation mode performing better than plants with a significantly higher load mode e.g Plant 453 burns the same fuel combination as plant 655, but performs better despite being smaller, 2 decades older and only operating for 1700 hours, compared to 8433 for Plant 655 • The data has too many sub-categories and combinations of sub-categories to allow for meaningful BATAELS to be specified for all the sub-categories • However, on rare occasions, 1 plant of 1 sub-category is exerting such a disproportional effect on the BATAEL that a separate note can be justified

• Coal to biomass converted plants ➢ Do not change the BAT.	AGREE	• In section 10 of the questionnaire, other plants report conversions e.g. from oil to coal, and these are not subject to special consideration

1.4.3.2.2 Table 10.11 – BAT-AELs for NOX – plants ≤100 MWth

In the following sub-sections, these amendments have been made to the proposed NOx BATAELs across the different size categories

Plant size (MWth)	EEB BP	New Plant BATAELs ($mgNm^3$)		Existing Plant BATAELs (mg/Nm^3)	
		Yearly	Daily	Yearly	Daily
<100	EEB	70 - 130	120 -180	70 - 150	120 -210
	BP	70 - 200	120 - 260	70 - 250	120 - 240
100-300	EEB	50 - 100	100 - 145	50 - 140	100 - 190
	BP	50 - 140	100 - 200	50 - 180	100 - 220
>300	EEB	40 – 100	65 – 120	40 – 140	95 - 150
	BP	40 -140	65 - 150	40 - 160	95 - 200

Plants of less than or equal to 100 MWth **NEW POINT: the BP refers to keeping the yearly averages for existing plants but makes no mention of new plants yearly averages or daily averages for either new or existing plants**	NEW POINT	
• **YEARLY UPPER AVERAGE FOR NEW PLANTS i.e. 200 mg/Nm^3**	DISAGREE with upper limit	• The D1 new plant upper limit of 200 mg/Nm^3 is set by plant 424-1 • However, this is out-performed by much older plants e.g.

NEW POINT • **DAILY UPPER AVERAGE FOR NEW PLANTS** i.e. **260 mg/Nm^3**	DISAGREE with upper limit	plant 460 (1963) and plant 456 (1984) -- 28 MWth operating for 2800 hours with fuel that includes 10% peat. • The 5 top performing plants burn a range of fuels, including up to 17% peat (Plant 466), and all operate with a combination of primary measures and SNCR, which it is reasonable to expect for new plants • **<u>These plants should therefore provide an upper BATAEL of 130 mg/Nm^3</u>** • A well run plant should not have a large variation between the yearly average and 95th % ile data • Plant 668 provides the basis for the BATAEL and does not have an excessive difference between the average and 95th % ile data i.e. a difference of 48 mg?Nm^3 • Similarly, plant 470 has a difference of 47 mg/Nm^3 between the average and 95th %ile data • **<u>Therefore the upper daily BATAEL for new plants should be 180 mg/Nm^3</u>**
• Yearly averages for existing plants ➢ Keep the upper end of the BAT-AEL range at 250 mg/Nm3.	DISAGREE	• It is reasonable that the upper BATAEL for existing plants should include plants operating with only primary measures, although some more recent existing plants also operate with SNCR. • Plant 456 (1984) only has primary measures, is 28 MWth and operates for only 2800 hours with fuel that includes 10% peat. • **<u>The upper yearly BATAEL for existing plants should therefore be 160 mg/Nm^3 (Plant 456)</u>**

NEW POINT • **UPPER DAILY AVERAGE FOR EXISTING PLANTS i.e. 310 mg/Nm^3**	DISAGREE with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • Plants 456 and 107 are high performing plants using only primary measures and they have 95th % ile data that exceeds the average by 41 and 47 mg/Nm^3 respectively • **Therefore the upper daily BATAEL for existing plants should be 210 mg/Nm^3**
Monitoring frequency • Keep continuous monitoring for plants of 50–100 MWth.	AGREE	• This is already the widespread practice amongst plants of this size
• Add a footnote for plants of < 100 MWth operated in peak- or emergency-load modes mentioning the possibility of periodic monitoring with 2 samples/yr (for peak-load plants) and 1 sample/yr (for emergency-load plants) respectively. • Add in the heading of the NOX BAT-AEL for daily average: 'or average over the sampling period'.	DISAGREE	• Plant 453 operates with continuous monitoring just above peak load i.e. at 1700 hours. • It is therefore reasonable to expect more frequent periodic monitoring for peak load plants e.g. 4 samples per year.
1.4.3.2.3 Table 10.11 – BAT-AELs for NOX – plants of 100–300 MWth		
Plants in the range 100–300 MWth • Yearly averages for new and existing plants ➢ Increase the proposed upper end of the yearly average BAT-AEL range for new plants from	DISAGREE with upper limit	• The Bureau's justification for increasing the upper yearly BATAEL for new plants is that it would include all the plants operating with SNCR.

130 to 140 mg/Nm3.		• However this does not mean that all plants should be included in the BATAEL, especially as the reference plant for the proposed increase to 140 mg/Nm^3 is plant 673 which burns only 58% biomass. • Further, plant 674 achieves 96 mg/Nm^3 by combining SNCR with SCR, and this should be the basis of the new plant BATAEL • **The upper BATAEL for new plants 100-300 MWth should therefore be 100 mg/Nm^3**
➢ Increase the proposed upper end of the yearly average BAT-AEL range for existing plants from 140 to 180 mg/Nm3.	DISAGREE with upper limit	• The only case made for an upper limit of 180 mg/Nm^3 is the possibility that some existing FBC plants may have difficulty getting the right temperature window in all loads. • However, CFBC plants even smaller than this size category operate SCNR e.g. Plants 466 (98 MWth) and 470 (50 MWth), both achieving emissions of ~70 mg/Nm^3 • In this size range, CFBC plants 190 (2004) and 46 (2008) are fitted with SNCR • It is these plants that should form the basis of the BATAEL, especially plant 190, which is slightly older and also fitted with primary NOx abatement measures. • Faced with this evidence, the upper BATAEL cannot be set higher on a possibility that might arise at some FBC plants for some loads. • **The upper BATAEL for existing plants should therefore remain at 140 mg/Nm^3 (Plant 190)**
	DISAGREE	

• Daily averages for new and existing plants ➢ Propose the upper end of the BAT-AEL range for new plants at 200 mg/Nm3.	with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • Plant 674 -- the proposed reference plant for the yearly average – does have an excessive difference between the average and 95th % ile data i.e. a difference of 73 mg/Nm3 • By contrast, Plant 455 uses the same SNCR-SCR combination with a difference between the yearly and 95th %ile data of 45 mg/Nm3 • **<u>For a yearly upper BATael of 100 mg/Nm3 the daily upper BATael for new plants should therefore be 145 mg/Nm3.</u>**
➢ Keep the proposed upper end of the BAT-AEL range for existing plants at 220 mg/Nm3.	DISAGREE with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • Plant 190 – the proposed reference plant with SNCR – does not have an excessive difference between the average and 95th % ile data i.e. a difference of 50 mg/Nm3. • Plant 667 shows the same difference. • **<u>For a yearly upper BATael of 140 mg/Nm3 the daily upper BATael for existing plants should therefore be 190 mg/Nm3.</u>**
1.4.3.2.4 Table 10.11 – BAT-AELs for NOX – plants of >300 MWth		
<u>Plants more than 300 MWth</u> • Yearly averages for new and existing plants ➢ Increase the proposed upper end of the yearly average BAT-AEL range for new plants from 130 to 140 mg/Nm3.	DISAGREE	• The proposed BATAEL is set by Plant 42, which cannot be BAT because it compares badly with Plant 539 • Plant 539 is about the same age, uses the same

		abatement technology but has lower emissions (121 mg/Nm^3) despite > twice the fuel NOx content because it burns 70% peat (*1.153 compared with 0.53 dry wt %)* • However, neither should Plant 539 be BAT because if a new plant wishes to burn peat, it should either make it a smaller proportion of the total fuel or fit SCR • **<u>The yearly upper BATAEL for new plants should therefore be 100 mg/Nm^3</u>**
➢ Increase the upper end of the yearly average BAT-AEL range for existing plants from 140 to 160 mg/Nm3.	DISAGREE	• This would set the proposed BATAEL at plant 14, which was reconfigured to burn biomass a year later than plant 42 was commissioned • However, despite having a much smaller fuel-S content of (0.094% compared to 0.53% dry wt) it performs worse. • **<u>Therefore the upper BATAEL limit for existing plants should remain at 140 mg/Nm^3 (Plant 42)</u>**
• <u>Daily</u> averages for new and existing plants ➢ Keep the upper end of the BAT-AEL range for new plants at 150 mg/Nm3.	DISAGREE	• A well run plant should not have an excessive difference between the yearly average and 95th %ile data • Both Plants 539 and 42 have 95th % ile data of ~10 mg/Nm^3 above the yearly average • Plant 31 has 95 %ile data ~20 mg/Nm^3 above the average emission. • **<u>The daily upper BATAEL for new plants achieving an average of 100 mg/Nm^3 should therefore be 120 mg/Nm^3</u>**
➢ Increase the upper end of the BAT-AEL range		

for existing plants to 200 mg/Nm3.	DISAGREE	• A well run plant should not have an excessive difference between the yearly average and 95th %ile data • The yearly upper BATAEL for existing plants is set by Plant 539, which has 95th % ile data of ~10 mg/Nm^3 above the yearly average • Plant 42, also burns peat and has 95th %ile data ~10 mg/Nm^3 above its average data • An upper BATAEL of 150 mg/Nm^3 includes all 95th %ile data within the EEB's proposed range for yearly averages • **<u>The daily upper BATAEL for existing plants achieving an average of 140 mg/Nm^3 should therefore be 150 mg/Nm^3</u>**
1.4.3.2.5 Table 10.11 - BAT-AELs for CO - solid biomass and/or peat		
• Yearly average - new and existing plants ➢ Propose BAT-AEL for new and existing plants below 100 MWth at 20–250 mg/Nm3. ➢ Propose BAT-AEL for new and existing plants of 100–300 MWth at 15–160 mg/Nm3. ➢ Propose BAT-AEL for new and existing plants above 300 MWth at 5–50 mg/Nm3. ➢ Exempt plants operating in peak- or emergency-load modes from the CO BAT-AELs. • Daily average - new and existing plants	DISAGREE For peak load plants	• Peak load plants could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth

➢ Do not propose BAT-AEL for CO as a daily average. • Monitoring frequency ➢ Change the monitoring frequency to periodic for plants of < 100 MWth operating in emergency- or peak-load modes.		
1.4.3.2.6 Table 10.11 – BAT-AELs for NH3 – solid biomass and/or peat		
• Yearly average - new and existing plants ➢ Change the BAT-AELs to <5–10 mg/Nm3 for all size categories. ➢ Indicate that the BAT-AELs for NH3 are only applicable when the SNCR and/or SCR techniques are used. ➢ The proposed BAT-AEL for NH3 emissions to air is shown in BAT 4 bis • Daily average - new and existing plants ➢ Do not include BAT-AELs expressed as daily averages. • Monitoring ➢ Mention the possibility to apply periodic monitoring (at least once/yr) when using dedusting and wet FGD techniques and the levels of NH3 are well within the proposed BAT-AELs.		
1.4.4 BAT 28 – SOX, HCl and HF emissions to air **1.4.4.1 BAT conclusion**		
• Fuel choice (a) ➢ Keep technique unchanged.	AGREE	• As the Bureau points out in its assessment, the wider data base of reference plants provides examples showing that

• Wet FGD (c) ➢ Change the applicability to 'Generally applicable' ➢ Include an applicability restriction for existing plants operating in emergency- or peak-load modes. The same for both of them?? • Boiler sorbent injection (d) ➢ Change applicability to 'Generally applicable'. • Duct sorbent injection (DSI) (e) ➢ Correct the name of the technique and refer to the description in Section 10.8 of the BAT conclusions. • New technique ➢ Include spray-dry absorption (SDA) as a generally applicable technique. • Flue-gas condenser (b) ➢ Change applicability to 'Generally applicable'.	AGREE	no additional applicability restrictions are necessary • Wet FGD is easily the most widely used form of FGD throughout the world
1.4.4.2 Table 10.12 – BAT-AELs for SOX, HCl and HF – solid biomass and/or peat **1.4.4.2.1 Table 10.12 – BAT-AELs for SOX – solid biomass and/or peat**		
<u>General</u> • Do not distinguish BAT-AELs based on the different types of biomass fuel. • Propose BAT-AELs for new and existing plants	AGREE	• The data has too many sub-categories and combinations of sub-categories to allow for meaningful BATAELS to be specified for all the sub-categories

<table>
<tr>
<td>according to the following size categories: plants of <100 MWth, plants of 100–300 MWth, and plants of ≥300 MWth.

• Specify with a footnote that for existing plants in all size categories burning 100 % peat the upper end of the yearly average of the BAT-AEL is 100 mg/Nm3 and the daily average is 215 mg/Nm3.</td>
<td>AGREE</td>
<td>• Plant 190 (2004) burning 100% peat performs better than the newer, larger Plant 539 burning only ~70% peat + biomass
• Plant 190 is therefore an appropriate reference plant for 100% peat burning

<u>Note</u>: This is a good proposal compared with the D1 alternative of 100 -165 mg/Nm^3 for plants burning >70% peat. It is based on an Irish plant that was included in the TWG survey at the EEB's request to block Finland from relaxing the standards for peat.</td>
</tr>
<tr>
<td colspan="3"><u>In the following sub-sections, these amendments have been made to the proposed SOx BATAELs across the different size categories</u>
<table>
<tr><th rowspan="2">Plant size (MWth)</th><th rowspan="2">EEB
BP</th><th colspan="2">New Plant BATAELs (mgNm^3)</th><th colspan="2">Existing Plant BATAELs (mg/Nm^3)</th></tr>
<tr><th>Yearly</th><th>Daily</th><th>Yearly</th><th>Daily</th></tr>
<tr><td rowspan="2"><100</td><td>EEB</td><td>15 - 50</td><td>30 - 85</td><td>15 - 65</td><td>30 - 180</td></tr>
<tr><td>BP</td><td>15 - 70</td><td>30 - 175</td><td>15 - 100</td><td>30 - 215</td></tr>
<tr><td rowspan="2">100-300</td><td>EEB</td><td><10 - 40</td><td><20 - 85</td><td><10 - 60</td><td><20 - 175</td></tr>
<tr><td>BP</td><td><10 - 50</td><td><20 - 85</td><td><10 - 70</td><td><20 - 175</td></tr>
<tr><td rowspan="2">>300</td><td>EEB</td><td><10 - 25</td><td><20 - 50</td><td><10 - 35</td><td><20 - 70</td></tr>
<tr><td>BP</td><td><10 – 35</td><td><20 – 70</td><td><10 - 50</td><td><20 - 85</td></tr>
</table>
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</tr>
<tr>
<td><u>2.1. Plants of <100 MWth</u></td>
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</table>

• Propose a yearly average BAT-AEL for new plants at 15–70 mg/Nm3.	DISAGREE with upper limit	• The BP proposed upper BATAEL for new plants is 70 mg/Nm^3, on the grounds that DSI achieves emissions <70 mg/Nm^3 • However, this adds nothing to an upper BATAEL based on the better performance of DSI at Plant 655 • **<u>The upper BATAEL for new plants should therefore be 50 mg/Nm^3(Plant 655)</u>**
• Propose a yearly average BAT-AEL for existing plants at 15–100 mg/Nm3.	DISAGREE with upper limit	• The BP proposed upper BATAEL is set by Plant 190 from the 100-300 MWth category • However, this 100% peat plant has already been made a separate case, so it is not reasonable to use it as the reference for a BATAEL for wider than that special case • The BP proposes using sorbent injection as the BAT technique, and plants 489-1 and 489-2 achieve emissions of 62 and 46 mg/Nm^3 with this technique within this size category. • Setting the upper BATAEL at 65 mg/Nm^3 would easily cover >69% peat combustion (Plant 1012; 120MWth; 2 mg/Nm^3) • **<u>The upper BATAEL for existing plants should therefore be 65 mg/Nm^3</u>**
• Propose a daily average BAT-AEL for new plants at 30–175 mg/Nm3.	DISAGREE with upper limit	• A well run plant should not have an excessive difference between the average and 95th %ile emissions • The upper yearly BATAEL for new plants is set by Plant 655, which has a difference of 33 mg/Nm^3 between its yearly and 95th %ile data

• Propose a daily average BAT-AEL for existing plants at 30–215 mg/Nm3.	DISAGREE with upper limit	• This is not excessive, compared with the differences of Plants 108-1 and 108-2 which also operate with DSI (differences between the yearly and 95th %ile data of 61 and 63 mg/Nm^3) • **<u>The upper daily BATAEL for new plants with a yearly average of 50 mg/Nm^3 should therefore be 85 mg/Nm^3(Plant 655)</u>** • A well run plant should not have an excessive difference between the average and 95th %ile emissions • None of the plants using sorbent injection in this size category provide 95th % ile data • However, Plant 46 (206MWth) uses sorbent injection and has 95th %ile data that is 112 mg/Nm^3 above the yearly average • **<u>The upper daily BATAEL for existing plants with a yearly average of 65 mg/Nm^3 should therefore be 180 mg/Nm^3</u>** ***<u>Note</u>:*** *The BAT technique, sorbent injection, exhibits greater volatility around the average than other techniques*
<u>Plants of 100–300 MWth</u> • Propose a yearly average BAT-AEL for new plants at <10–50 mg/Nm3.	DISAGREE with upper limit	• The proposed upper end of the BATAEL range for new plants is based on SDA at Plant 489-3, an existing plant of 69 MWth. • Emissions standards are inversely related to plant size, and existing plants have higher emissions than new ones. Therefore the use of this plant as reference for the new plant standard for the 100-300 MWth category requires adjustment to the assumed emissions on both counts. • **<u>The upper BATAEL for new plants should therefore be 40 mg/Nm^3</u>**

• Propose a yearly average BAT-AEL for existing plants at <10–70 mg/Nm3.	DISAGREE with upper limit	• The BP proposed upper BATAEL for existing plants is 70 mg/Nm^3, on the grounds that DSI achieves emissions <70 mg/Nm^3 • One plant cited (108-1) is in the <100 MWth category, whilst the other, plant 46, is in this size category but achieves emissions of 59 mg/Nm^3 whilst burning 47% peat • **<u>The upper BATAEL for existing plants should therefore be 60 mg/Nm^3 (Plant 46)</u>**
• Propose a daily average BAT-AEL for new plants at <20–85 mg/Nm3.	AGREE with upper limit	• A well run plant should not have an excessive difference between its average and 95th % ile emissions • The reference plant for this BATAEL comes from a different size category and does not provide 95th % ile data • However, a plant with similar emissions (655) achieves upper daily emissions of 85 mg/Nm^3 • **<u>Therefore the upper daily new plant BATAEL is set appropriately at 85 mg/Nm^3</u>** ***<u>Note</u>:*** *It is possible to make a much worse case than this, so it would be inadvisable to do anything but minimise debate*
• Propose a daily average BAT-AEL for existing plants at <20–175 mg/Nm3.	AGREE with upper limit	• A well run plant should not have an excessive difference between its average and 95th % ile emissions • Plant 46 was the reference for the yearly average and this has 95th %ile emissions of 171 mg/Nm^3 • The other DSI plant in this size category (505) does not

		provide 95th %ile data • **Therefore the upper daily existing plant BATAEL is set appropriately at 175 mg/Nm^3**
Plants of ≥300 MWth • Propose a yearly average BAT-AEL for new plants at <10–35 mg/Nm3.	DISAGREE with upper limit	• The upper limit for new plants is based on WFGD operating with 95% desulphurisation • No justification is given for the choice of this apparently low desulphurisation rate • Of the 2 plants in this size category using WFGD, Plants 27 and 31 have removal efficiencies of 96.7% and 97.14 respectively • A desulphurisation rate of 96.5% would give emissions of 24.5 mg/Nm^3 • **The upper BATAEL for new plants should therefore be 25 mg/Nm^3**
• Propose a yearly average BAT-AEL for existing plants at <10–50 mg/Nm3.	DISAGREE with upper limit	• The upper end of the BATAEL range for existing plants is based on SDA at Plant 489-3, an existing plant of 69 MWth. • Emissions standards are inversely related to plant size, using a 69 MWth plant as the reference for plants >4 times larger requires adjustment to the assumed emissions • **The upper BATAEL for new plants should therefore be 35 mg/Nm^3**
• Propose a daily average BAT-AEL for new plants at <20–70 mg/Nm3.	DISAGREE with upper limit	• A well run plant should not have an excessive difference between its yearly average and 95th %ile emissions • Neither of the 2 plants operating WFGD in this size

• Propose a daily average BAT-AEL for existing plants at <20–85 mg/Nm3.	DISAGREE with upper limit	category provide 95th % ile data • The BP uses the data for Plant 42, which has a difference of 21 mg/Nm^3 between its average and 95th %ile data • However, no account has been taken of the fact that Plant 42 has average emissions (49 mg/Nm^3) above both the BP and EEB BATAEL proposals for new plants • **Therefore the upper daily BATAEL for a yearly BATAEL of 25 mg/Nm^3 should be 50 mg/Nm^3** • A well run plant should not have an excessive difference between its yearly average and 95th % ile emissions • The reference plant (655) used in the BP to set the upper daily limit for existing plants has a difference of 33 mg/Nm^3 between its average and 95th % ile data • **Therefore the upper daily BATAEL for a yearly BATAEL of 35 mg/Nm^3 should be 70 mg/Nm^3**
Monitoring • For plants of <100 MWth operated in peak-load mode, propose periodic monitoring (twice/year),	DISAGREE	• Of the 29 plants <100 MWth reporting on monitoring in this size category, 24 use continuous monitoring • The BP justifies reduced monitoring for peak load plants on the grounds that there are lower emissions over the year due to the reduced number of hours • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US:

		➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
• and for plants of <100 MWth operated in emergency-load mode, propose monitoring as at least once every year. <u>Load mode and factor</u> • For plants operated in emergency- and peak-load modes, propose only daily	DISAGREE	• The BP suggests that yearly averages may not be needed because of 'only' 1500 operating hours per year • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass)

		• The BREF is setting <u>Best</u> Available Techniques
1.4.4.2.2 Table 10.12 – BAT-AELs for HCl – solid biomass and/or peat		
<u>General</u> • Do not distinguish BAT-AELs based on the different types of biomass fuel.	AGREE	• The data has too many sub-categories and combinations of sub-categories to allow for meaningful BATAELS to be specified for all the sub-categories • However, on rare occasions, 1 plant of 1 sub-category is exerting such a disproportional effect on the BATAEL that a separate note can be justified – as proposed in Section 1.4.3.2.1, p.90 of the BP
• Set BAT-AELs for new and existing plants according to the following size categories: plants of <100 MWth, plants of 100–300 MWth, and plants of ≥300 MWth.		
• Add a footnote mentioning that the lower end of the BAT-AEL ranges for existing plants is difficult to achieve at plants fitted with wet FGD with a gas-gas heater.		
<u>Yearly and daily average</u> • Specify with a footnote that for existing plants in all size categories burning 100 % high Cl content biomass such as straw the upper end of the yearly average of the BAT-AEL is 20 mg/Nm3	DISAGREE	• There is one 100% straw plant in D1 figure 5.48 i.e. Plant 33, with HCl emission of >17 mg/Nm^3 • **<u>The upper end of the yearly average should therefore be 18 mg/Nm^3 (Plant 33)</u>**
• and the daily average is 35 mg/Nm3.	AGREE	• Plant 46 is cited as the reference plant for this upper daily

<table>
<tr><td></td><td></td><td>limit due to a high level of HCl in its flue gases
• The 95th %ile data for Plant 46 is 33 mg/Nm3
• <u>The upper end of the daily average should therefore be 35 mg/Nm3 (Plant 46)</u>

<u>Note</u>: We could gain a bit marginally on this through challenging the rounding up of the data for plant 46, but daily average can be more variable anyway. It is probably best not to take TWG time arguing this</td></tr>
<tr><td colspan="3"><u>In the following sub-sections, these amendments have been made to the proposed HCl BATAELs across the different size categories</u>

<table>
<tr><th rowspan="2">Plant size (MWth)</th><th rowspan="2">EEB
BP</th><th colspan="2">New Plant BATAELs (mgNm3)</th><th colspan="2">Existing Plant BATAELs (mg/Nm3)</th></tr>
<tr><th>Yearly</th><th>Daily</th><th>Yearly</th><th>Daily</th></tr>
<tr><td rowspan="2"><100</td><td>EEB</td><td>0.3 – 5</td><td>1 - 12</td><td>0.3 – 6</td><td>1 – 15</td></tr>
<tr><td>BP</td><td>0.3 – 7</td><td>1 – 12</td><td>0.3 – 15</td><td>1 – 34</td></tr>
<tr><td rowspan="2">100-300</td><td>EEB</td><td>0.3 – 5</td><td>1 – 12</td><td>0.3 – 6</td><td>1 – 12</td></tr>
<tr><td>BP</td><td>0.3 – 5</td><td>1 – 12</td><td>0.3 – 9</td><td>1 – 12</td></tr>
<tr><td rowspan="2">>300</td><td>EEB</td><td>0.3 - 4</td><td>1 – 10</td><td>0.3 – 4</td><td>1 – 10</td></tr>
<tr><td>BP</td><td>0.3 - 5</td><td>1 - 12</td><td>0.3 - 5</td><td>1 - 12</td></tr>
</table></td></tr>
<tr><td><u>Plants of 50–100 MWth</u>
• Propose a yearly average BAT-AEL for new plants at <0.3–7 mg/Nm3.</td><td>DISAGREE with upper limit</td><td>• The upper yearly average for new plants is set by Plant 411 whose emissions are noted in the D1 text as including other than normal operating conditions
• However, an upper BATAEL set at Plant 108-1 would include fuel choice together with the range of other SO_2 and boiler technologies
• <u>The upper BATAEL for new plants should therefore be 5</u></td></tr>
</table>

		<u>mg/Nm^3 (Plants 322 and 536)</u> ***<u>Note</u>:*** *A case could have been made for 3 mg/Nm^3 but this would have been out of sequence with the BATAELs across the size ranges*
• Propose a yearly average BAT-AEL for existing plants at 0.3–15 mg/Nm3.	DISAGREE with upper limit	• The proposed upper BATAEL is explicitly set on the basis of plant 505 (139 MWth) operating DSI • It is not acceptable to set the upper BATAEL for existing plants on a reference plant from a different size category when that plant is performing less well than DSI plants within the size category • Plant 108-2 is the worst performing plant using DSI within the size range, with emissions of 6 mg/Nm^3, and using this to set BAT would include DSI within both PC and FBC plants • **<u>The upper BATAEL for existing plants should therefore be 6 mg/Nm^3 (Plant 108-1)</u>** ***<u>Note</u>:*** *We could have gone to 5 mg/Nm^3 but this would have been out of sequence with the case that can be made for plants 100-300 MWth*
• Propose a daily average BAT-AEL for new plants at 1–12 mg/Nm3.	DO NOT OPPOSE	***<u>Note:</u>*** *A case could be made for 11 mg/Nm^3, a marginal improvement. However, this would put in out of sequence with the equivalent upper BATAEL for plants 100-300 MWth*
• Propose a daily average BAT-AEL for existing plants at	DISAGREE	• A well run plant should not have a large variation

1–35 mg/Nm3.	with upper limit	between the yearly average and 95th % ile data • This upper limit has been explicitly set on the basis of plant 424-2 which is unacceptable because: ➢ Plant 424-2 uses periodic measurement whilst the BP sets a requirement for continuous monitoring ➢ It has a yearly average (36 mg/Nm^3) that is much higher than the proposed yearly average as the BATAEL ➢ It daily emissions are excessive – its 95th % ile data exceeds its average by 31 mg/Nm^3 compared with plants 125, 108-1, 655 and 108-2 at 9, 6, 6 and 6 mg/Nm^3 • **<u>The upper daily limit for an existing plant yearly average of 5 mg/Nm^3 should therefore be 15 mg/Nm^3</u>**
<u>Plants of 100–300 MWth</u> • Propose a yearly average BAT-AEL for new plants at 0.3–5 mg/Nm3.	AGREE	• The Bureau's proposal is set by plant 655 (86 MWth), fitted with DSI • Plant 125 is the same age and size category and operates with DSI and a BATAEL set by this plant includes both FBC and PC • **<u>Therefore the upper yearly BATAEL for new plants should be 5 mg/Nm^3 (Plant 655)</u>** ***<u>Note</u>:*** *A case could have (just about) been made for 3 mg/Nm^3, but this would have been out of sequence with the BATAELs that could be achieved for larger plant*
• Propose a yearly average BAT-AEL for existing plants at 0.3–9 mg/Nm3.	DISAGREE with upper limit	• The BP appears to cite Plant 25-2 using sorbent injection as the reference plant for an emission of 9 mg/Nm^3 • However, plant 25-2 has emissions 7 mg/Nm^3, including

• Propose a daily average BAT-AEL for new plants at 1–12 mg/Nm3. • Propose a daily average BAT-AEL for existing plants at 1–12 mg/Nm3.	DO NOTHING } DO NOTHING }	ONOCs -- its emissions should be adjusted to take account of the ONOC • **<u>The upper BATAEL for existing plants should therefore be 6 mg/Nm^3</u>** ***<u>Note</u>:*** *The Bureau has picked a plant as the reference for daily BATAELS that has lower average emissions than the plants in question. It has therefore applied 95th %ile data that is closer to the average than the data set suggests is appropriate. This works in our interests*
<u>Plants of ≥300 MWth</u> • Propose a yearly average BAT-AEL for new plants at 0.3–5 mg/Nm^3 • Propose a yearly average BAT-AEL for existing plants at 0.3–5 mg/Nm3.	DISAGREE with upper limit } DISAGREE with upper limit}	• The reference plant for the upper limit for both new and existing plants is outside the size category -- 489-3 (69 MWth), fitted with SDA with emissions of 5 mg/Nm^3 • It is to be expected that an SDA plant >300 MWth would have lower emissions than one <100 MWth • **<u>The upper yearly BATAEL for both new and existing plants should therefore be 4 mg/Nm^3 (Plant 489-3, adjusted for size category)</u>**
• Propose a daily average BAT-AEL for new plants at 1–12 mg/Nm3. • Propose a daily average BAT-AEL for existing plants at 1–12 mg/Nm3.	DISAGREE with upper limit } DISAGREE with upper limit}	• A well run plant should not have a large variation between the yearly average and 95th % ile data • The BP rationale is to adopt the variability of DSI as equivalent to that of SDA, which is represented by plants from a different size category • Those reporting 95th % ile data include plants 655, 108-1 and 108-2, all of which have 95th % ile data 6 mg/Nm^3 above the yearly average.

		• **<u>Therefore the upper daily BATAEL for both new and existing plants with a yearly average of 4 mg/Nm^3 should be 10 mg/Nm^3</u>** ***<u>Note</u>:*** *The Bureau's logic is very contrived, but the important thing is to get these emissions down to allow for tightening of the more important smaller categories*
<u>Monitoring</u> • Keep continuous measurement • with a footnote allowing its reduction when emissions are proven to be low over the long term, the frequency in that case being at each change of fuel characteristics that may impact the emissions, and at least twice/yr. • Propose a different monitoring frequency for plants of 50–100 MWth operated in peak-load at twice/yr and in emergency-load modes, at once/yr. <u>Load mode and factor</u>	AGREE DISAGREE	• Reference plants, such as 125, 108-1 and -2 and 665 are all <100 MWth, but all use continuous monitoring • It is therefore appropriate that continuous monitoring should be BAT • Nearly all plants in this size category apply continuous monitoring • The BP justification for reducing this for peak load plants is the reduced hours and emissions • However, this could still represent ~ 37% of base load operation each year • In the US, standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. • The BREF is setting <u>Best</u> Available Techniques

• For emergency- and peak-load mode plants, propose only daily average BAT-AELs (or average over the sampling period).	DISAGREE	• The BP justification for not applying yearly BATAELs to peak load plants is that they are only operating for 1500 hours per year • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass)
<u>Coal to biomass</u> • Do not include special considerations for plants that have converted from coal to biomass.	AGREE	• In section 10 of the questionnaire, other plants report conversions e.g. from oil to coal, and these are not subject to special consideration
1.4.4.2.3 Table 10.12 – BAT-AELs for HF – solid biomass and/or peat		
<u>General</u> • Do not distinguish BAT-AELs based on the different types of biomass fuel.	AGREE	• The data has too many sub-categories and combinations of sub-categories to allow for meaningful BATAELS to be specified for all the sub-categories • However, on rare occasions, 1 plant of 1 sub-category is

• Propose BAT-AELs for new and existing plants according to the following plant categories: plants of <100 MWth, plants of 100–300 MWth, and plants of ≥300 MWth. • Add a footnote mentioning that the lower end of the yearly BAT-AEL ranges for existing plants is difficult to achieve at plants fitted with wet FGD with a gas-gas heater.		exerting such a disproportional effect on the BATAEL that a separate note can be justified – as proposed in Section 1.4.3.2.1, p.90 of the BP

In the following sub-sections, these amendments have been made to the proposed HF BATAELs across the different size categories

Plant size (MWth)	**EEB BP**	**New Plant BATAELs ($mgNm^3$)**		**Existing Plant BATAELs (mg/Nm^3)**	
		Yearly		**Yearly**	
<100	EEB	0.01 – 0.2		0.01 – 1.0	
	BP	0.01 – 1.0		0.01 – 1.3	
100-300	EEB	0.01 – 0.15		0.01 – 1.0	
	BP	0.01 – 0.08		0.01 – 1.0	
>300	EEB	0.01 – 0.15		0.01 – 0.5	
	BP	0.01 – 0.3		0.01 – 0.5	

Plants of <100 MWth • Propose BAT-AEL as an average over the sampling period for new plants at <0.01–1 mg/Nm3.	DISAGREE with upper limit	• The BP states that the proposed upper limit is set by Plant 680 in the 100-300 MWth category, -- but this has emissions of 1.3 mg/Nm^3 • Instead it is set by plant 1012, burning 60% peat • However, Plant 46 in that category burns 47% peat with average HF emissions of only 0.06 mg/Nm^3 • And in the <100 MWth category, Plant 470 achieves emissions of 0.18 mg/Nm^3 whilst burning 21% peat • **The upper BATAEL for new plants should therefore be 0.2 mg/Nm^3 (Plant 470)**
• Propose BAT-AEL as an average over the sampling period for existing plants at <0.01–1.3 mg/Nm3.	DISAGREE with upper limit	• The proposed upper limit is nearly twice the highest average emission in the sample of plants <100 MWth • It is presumably derived from reference Plant 680, which is the worst performing plant in the 100-300 MWth category • However, plant 680 burns only 19.1% of peat, compared to Plant 1012 which burns 60% peat but performs better than plant 680 • Plant 1012 covers the full range of abatement techniques and equivalent full load operating factors • **The upper BATAEL for existing plants should therefore be 1.0 mg/Nm^3 (Plant 1012)**
Plants of 100–300 MWth • Propose BAT-AEL as an average over the sampling period for new plants at <0.01–0.8 mg/Nm3.	DISAGREE with upper limit	• It is not clear which reference plant has been used to set the upper BATAEL • However, setting it at Plant 476 includes all abatement techniques, fuels and equivalent full load operating factors

• Propose BAT-AEL as an average over the sampling period for <u>existing</u> plants at <0.01–1 mg/Nm3.	AGREE with upper limit	• **<u>The upper BATAEL for new plants should therefore be 0.15 mg/Nm^3 (Plant 476)</u>** • The upper BATAEL is set by plant 1012 which burns 60% peat • It covers the full range of abatement techniques and equivalent full load operating factors • **<u>The upper BATAEL for existing plants should therefore be 1.0 mg/Nm^3 (Plant 1012)</u>**
<u>Plants of ≥300 MWth</u> • Propose BAT-AEL as an average over the sampling period for <u>new</u> plants at <0.01–0.3 mg/Nm3.	DISAGREE with upper limit	• The best performing plant in the >300 MWth category is Plant 31 (0.3 mg/Nm^3) • That is worse than 6 out of the 8 plants in the 100-300 MWth category • These plants should therefore set the BATAEL • **<u>The upper BATAEL for new plants should therefore be 0.15 mg/Nm^3 (Plant 1012)</u>**
• Propose BAT-AEL as an average over the sampling period for existing plants at <0.01–0.5 mg/Nm3.	AGREE with upper limit	• The upper BATAEL is set at Plant 1004. • There are only 2 plants in the sample and as Plant 1004 burns 86% peat, this is the appropriate one for setting the upper BATAEL. • **<u>The upper BATAEL for new plants should therefore be 0.5 mg/Nm^3 (Plant 1004)</u>**
<u>Monitoring</u> • Change the periodic monitoring to once per year.	DISAGREE	• Plants as small as 50 MWth are applying continuous monitoring (Plant 470), with nearly all the other plants in this size category monitoring 2-4 times per year • The majority of plants in the 100-300 MWth category

		apply continuous monitoring • As the purpose of the BREF is to set <u>Best</u> Available Techniques, BAT should be continuous monitoring ***<u>Note</u>:*** *This has been downgraded from 4 X per year in D1*
<u>Load mode and factor</u> • For existing plants operated in emergency- and peak-load modes, propose BAT-AEL as an average over the sampling period to <0.01–1.3 mg/Nm3.	DISAGREE	• The BP justification for not applying the BATAELs to peak load plants is that they are only operating for 1500 hours per year • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
<u>Coal to biomass</u> • Do not include special considerations for plants that have converted from coal to biomass.	AGREE	In section 10 of the questionnaire, other plants report conversions e.g. from oil to coal, and these are not subject to special consideration

1.4.5 BAT 29 – Dust and particulate-bound metals emissions to air 1.4.5.1 BAT conclusion		
• General ➢ Keep the list, description and applicability of BAT in one table.	AGREE	• This enables a coherent overview of the relevant factors
➢ Add dry, semi-dry or wet FGD techniques in the list of BAT	AGREE	• This is already in use e.g. at Plant 31
➢ and add an applicability restriction for wet FGD in plants operated in emergency- or peak-load modes.	DISAGREE	• The BP provides no justification for this proposed restriction • Plants as small as 58 MWth (1002) and 74 MWth (464) are fitted with WFGD • The BP justification for not applying the BATAELs to peak load plants is that they are only operating for 1500 hours per year • Peak load could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
• Fuel choice (a)		

➢ Amend the example in the description of the technique to indicate the use of fuels with low ash content. • Bag filter (b) ➢ Change the applicability to generally applicable. • High-performance electrostatic precipitator (c) ➢ Change the name of the technique to electrostatic precipitator (ESP). ➢ Change the applicability to generally applicable.	AGREE AGREE DISAGREE AGREE	• Ash is a fuel parameter that is particularly relevant to dust emissions • BAG filters have been applied across the size ranges and as retrofits • It is suggested that the BATAELs will ensure a high level of performance for ESPs. • However, it would not be acceptable for an installation to operate with a low number of ESP fields simply because that application could achieve the upper BATAEL limit with that • High performance should be required of all plants • ESPs have been applied across size ranges, fuels and as retrofits
1.4.5.2 Table 10.13 – BAT-AELs for dust – solid biomass and/or peat		
General • Propose BAT-AELs for new and existing plants for the following plant categories: plants of <100 MWth, plants of 100–300 MWth, and plants of ≥300 MWth. • Propose the lower end of all the BAT-AEL ranges at 2 mg/Nm3.	AGREE DISAGREE	• This would have placed too many demands on the database presented on the D1 graphs, but it is feasible with the extended database • 7 of the 17 reference plants presented in D1 Fig 5.50 are confident of reporting dust emissions <2 mg/Nm^3 ***Note:*** *the issue here is the limit of quantification, set at 2*

		mg/Nm^3, with the limit of detection being 0.3 mg/Nm^3

<u>In the following sub-sections, these amendments have been made to the proposed dust BATAELs across the different size categories</u>

Plant size (MWth)	**EEB BP**	**New Plant BATAELs (mgNm^3)**		**Existing Plant BATAELs (mg/Nm^3)**	
		Yearly	**Daily**	**Yearly**	**Daily**
<100	EEB	2 - 3.5	2 - 6	2 - 6	2 - 12
	BP	2 - 5	2 - 20	2 - 15	2 - 24
100-300	EEB	2 - 3.5	2 - 16	2 - 5	2 - 12
	BP	2 - 5	2 - 16	2 - 12	2 - 18
>300	EEB	2 – 3	2 – 8	2 – 5	2- 10
	BP	2 - 5	2 - 10	2 - 10	2 - 18

<u>Plants of <100 MWth</u> • Propose a yearly average BAT-AEL for <u>new</u> plants at 2–5 mg/Nm3.	DISAGREE with upper limit	• There is no reference plant according with the proposed BATAEL -- it lies between Plants 424 and 125 • However, a BATAEL set at Plants 424-2 and 489-3, provides no loss in the range of fuels combustion technologies or dust abatement techniques • **<u>The upper yearly BATAEL for new plants should therefore be 3.5 mg/Nm^3 (Plants 424-2 and 489-3</u>** ***<u>Note</u>:*** *This could have gone tighter, but it would then have been out of sequence with the BATAELs for 100-300 and >300 MWth plants. Those categories could not go further on this BATTAEL*
• Propose a yearly average BAT-AEL for <u>existing</u> plants at 2–15 mg/Nm3.	DISAGREE	• The proposed BATAEL is set by Plant 676

	with upper limit	• However, setting the BATAEL at this plant allows just 5 plants to increase the upper BATAEL by a factor of 2.5 from the BATAEL set by the other 17 plants • This is allowing a few plants a disproportionate impact on the BATAEL that is not justified by the data – it adds nothing to a BATAEL set by Plant 457 in terms of plant size, age, load factor and boiler and dust abatement technologies • Plant 457 (28 MWth) was commissioned in 1984 and operates for just 3200 hours. • **<u>The upper yearly BATAEL for existing plants should therefore be 6 mg/Nm^3 (Plant 457)</u>**
• Propose a daily average BAT-AEL for new plants at 2–20 mg/Nm3.	DISAGREE with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • The reference plants proposed by the EEB for this BATAEL do not provide 95th % ile data but neighbouring plants do – Plants 108-1, 72 and 125 have 95th % ile data that is higher than the average data by 2.68, 2.4 and 2.66 mg/Nm^3 respectively • **<u>The upper daily BATAEL for new plants with average data of 3.5 mg/Nm^3 should therefore be 6 mg/Nm^3</u>**
• Propose a daily average BAT-AEL for existing plants at 2–24 mg/Nm3.	DISAGREE with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • The reference plant proposed by the EEB for this BATAEL does not provide 95th % ile data and neither does any other plant abated by ESP + FGD condenser • However, neighbouring plants do – Plants 655, 464 and 125 have 95th % ile data that is higher than the average

		data by 4.95, 6.19 and 2.4 mg/Nm^3 respectively • **The upper daily BATAEL for existing plants with average data of 6 mg/Nm^3 should therefore be 12 mg/Nm^3**
Plants of 100–300 MWth • Propose a yearly average BAT-AEL for new plants at 2–5 mg/Nm3.	DISAGREE with upper limit	• The proposed BATAEL is set at Plant 686 and includes a number of existing plants • However, this adds nothing to a BATAEL set by Plant 190, which includes plants burning 100% peat and straw, and covers the range of boiler and abatement technologies • **The upper BATAEL for new plants 100-300 MWth should therefore be 3.5 mg/Nm^3 (Plant 190)**
• Propose a yearly average BAT-AEL for existing plants at 2–12 mg/Nm3.	DISAGREE with upper limit	• The proposed BATAEL is set at Plant 13 • However, this adds nothing to an upper BATAEL set at Plant 686, which includes several plants burning varying proportions of the higher dust herbaceous and peat fuels. • It also includes the range of boiler and dust abatement technologies featured in the sample • **The upper BATAEL for existing plants 100-300 MWth should therefore be 5 mg/Nm^3 (Plant 686)** ***Note:*** *We could have tried for higher, but that would have put the BATAEL stricter than for plants >300 MWth. The problem there is the fewer number of plants in the sample limiting the scope for improvement.*
• Propose a daily average BAT-AEL for new plants at 2–16 mg/Nm3.	AGREE with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • The EEB's yearly BATAEL is set by Plant 190 which has 95th %ile data ~16 mg/Nm^3

		• **<u>Therefore the upper daily BATAEL should be 16 mg/Nm^3</u>**
• Propose a daily average BAT-AEL for <u>existing</u> plants at 2–18 mg/Nm3.	DISAGREE with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • The EEB's yearly BATAEL is set by Plant 686, which does not provide 95th %ile data • However, neighbouring plant 674 with the same ESP abatement technology does – here the 95th %ile data is 7 mg/Nm^3 higher than the average • **<u>Therefore a yearly upper BATAEL of 5 mg/Nm^3, the upper daily BATAEL should be 12 mg/Nm^3</u>**
<u>Plants of ≥300 MWth</u> • Propose a yearly average BAT-AEL for new plants at 2–5 mg/Nm3.	DISAGREE with upper limit	• The proposed upper BATAEL is set by plant 14 • Setting the BATAEL at the better performing Plant 539 (2010) would include the boiler, fuel and dust abatement options • **<u>Therefore the yearly upper BATAEL for new plants >/= 300 MWth should be 3 mg/Nm^3 (Plant 539)</u>**
• Propose a yearly average BAT-AEL for existing plants at 2–10 mg/Nm3.	DISAGREE with upper limit	• An upper BATAEL of 10 mg/Nm^3 is set by plant 31, which is the only plant in the sample burning straw (25%) • Straw has an ash content about 5 x that of other biomass, but so does peat, which is represented in similar or larger amounts in better performing plants • Setting the upper BATAEL at Plant 14 covers the age range (including retrofits), the range of fuels relevant to dust, and the boilers and dust control techniques in the sample

		• **<u>Therefore the yearly dust upper BATAEL for existing plants should be 5 mg/Nm^3 (Plant 14)</u>** ***<u>Note</u>:*** *This hopefully side-steps the constraint of having to include straw in the existing BATAELs*
• Propose a daily average BAT-AEL for <u>new</u> plants at 2–10 mg/Nm3.	DISAGREE with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • Plant 14 set the EEB's yearly BATAEL, with 95th %ile emissions 5.6 mg/Nm^3 above the yearly average, this is not excessive -- plant 42 has an equivalent figure of 95th 4 mg/Nm^3 • **<u>Therefore the daily upper BATael for new plants with a yearly average of 3 mg/Nm3 should be 8 mg/Nm^3</u>**
• Propose a daily average BAT-AEL for <u>existing</u> plants at 2–18 mg/Nm3.	DISAGREE with upper limit	• A well run plant should not have a large variation between the yearly average and 95th % ile data • Plant 539 set the EEB's yearly BATAEL and its 95th % ile data is 7.6 mg/Nm^3 higher than its average – 5.6 mg/Nm^3 higher. • However, this is high compared with the differences between average and 95th %ile data of Plants 42 and 14 of 4 and 5.66 mg/Nm^3 respectively • **<u>Therefore the daily upper BATael for existing plants with a yearly average of 5 mg/Nm3 should be 10 mg/Nm^3</u>**
<u>Monitoring</u> • Propose continuous monitoring except for plants of <100 MWth operating in emergency- or peak-load	DISAGREE	• There is widespread use of continuous monitoring in plants <100 MWth

mode: periodic measurement. <u>Load mode and factor</u> • For plants operated in emergency- or peak-load modes, propose BAT-AELs only as a daily average or as an average over the sampling period. <u>Coal to biomass</u> Do not include special considerations for plants that have converted from coal to biomass.	DISAGREE AGREE	• The proposal to exempt peak load and emergency plants is justified in the BP as being due to their lower emissions • However, this could still represent ~ 37% of base load operation each year • The BP justification for not applying the BATAELs to peak load plants is that they are only operating for 1500 hours per year • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques • In section 10 of the questionnaire, other plants report conversions e.g. from oil to coal, and these are not subject to special consideration

1.4.6 BAT 30 – Mercury emissions to air 1.4.6.1 BAT conclusion		
<u>General</u> • Split the techniques according to the two following categories: ➢ techniques specifically aiming at reducing mercury emissions (i.e. Fuel choice - use of low-Hg fuel- and Activated carbon duct injection); ➢ techniques primarily used to abate pollutants other than mercury and that provide co-benefits with regard to mercury emissions reduction (i.e. Bag filter, ESP, and FGD technique). • Set an applicability restriction for 'Fuel choice' technique associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State.	} AGREE	• This is an appropriate distinction between active and passive Hg abatement
• Set the applicability of the Activated carbon duct injection technique as generally applicable.	AGREE	• It is the most frequently used Hg-specific abatement technique in the US across all plant sizes and fuel types. • It is already used on 9 TWG EU biomass and peat reference plants • Its capital costs are low, making it dose sensitive and therefore suited to incremental improvements to achieve a required standard
• Set the same applicability restrictions for the Bag filter, ESP and FGD techniques as those set for the use of these techniques for the other pollutants.	AGREE	• There is nothing in Hg co-benefit removal that would make these techniques more or less applicable

Activated carbon duct injection (a) • Keep the technique as a specific technique to reduce mercury emissions.	AGREE	• ACI is widely recognised as a Hg-specific technique
1.4.6.2 Table 10.14 – BAT-AELs for mercury – solid biomass and/or peat		
General • Keep the BAT-AELs in a range format.		
• Keep the proposed lower end of the BAT-AEL range to <1 µg/Nm3.	DISAGREE	• There are 9 reference plants meeting this standard – covering the size range and including both bag filters and ESP, as well as ACI • The proposed quantified limit is >10 X the limit of quantification, with plants obviously sufficiently confident to cite limits much lower • The US sets ELVs (for coal) significantly below 1 mg/Nm^3 • **The lower limit should therefore be 0.1 ug/Nm^3**
• Keep the proposed upper end of the BAT-AEL range at 5 µg/Nm3.	DISAGREE with upper limit	• The proposed upper BATAEL is set by Plant 424-2 • However, this adds nothing to a tighter BATAEL set at Plant 1004, which equally includes the full range of fuel, plant types and sizes, abatement techniques • **The upper BATAEL for existing plants should therefore be 3 ug/Nm^3 (Plant 1004)**
• Include a footnote specifying that BAT-AELs do not apply to plants operating in emergency- or peak-load modes.	DISAGREE	• The BP rationale is that co-benefit abatement depends upon the operation of techniques that may not be applied for peak or emergency loads

Monitoring • Keep periodic monitoring (once/yr) as generic. • Add a footnote allowing the monitoring frequency to be after any significant change of fuel if after the fuel characterisation (see BAT 5), it is demonstrated that the emission levels are consistently within the BAT-AELs set.	DISAGREE} DISAGREE}	• However, it is the EEB's view that there should be no differentiation between load modes for those techniques • This is supported by practice in the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques • 4 reference plants, all <100 MWth, already implement continuous monitoring for Hg i.e. Plants 655, 125, 108-2 and 108-1 • **Continuous monitoring is therefore BAT**
1.4.7 BAT 24 General environmental performance		
Remove technique (a). As a consequence, BAT 24 becomes redundant and it is proposed to delete it.		
1.5 Liquid fuel combustion		
1.5.1 HFO- and/or gas oil-fired boilers		
1.5.2 HFO- and/or gas oil-fired engines		

1.5.2.1 BAT 35 – Energy efficiency **1.5.2.1.1 BAT 35 – Energy efficiency**		
1.5.2.1.2 Table 10.19 – BAT-AEELs for energy efficiency – HFO and/or gas oil		
1.5.2.2 BAT 36 and BAT 37 – NOX, NH3, CO and unburnt carbon emissions to air **1.5.2.2.1 BAT 36 – NOX emissions to air**		
1.5.2.2.2 BAT 37 – CO and unburnt carbon emissions to air		
1.5.2.2.3 Table 10.20 – BAT-AELs for NOX, NH3, CO – HFO **1.5.2.2.3.1 Table 10.20 – General**		
• Do not exclude plants located in small isolated systems from the table. • Modify the structure of the table.	AGREE	• Plants in small isolated systems are part of the database from which the BATAELs have been derived and have therefore been taken into account • The EEB provided data on plants located on islands
1.5.2.2.3.2 Table 10.20 – BAT-AELs for NOX – HFO		
<u>Yearly averages</u> • Propose a yearly average BAT-AEL range for new plants of 115–140 mg/Nm3.	AGREE with lower limit but DISAGREE with upper limit	<u>Lower limit</u> • Following the Intermediate Meeting, the EEB submitted data on the operation of SCR at plants 362-365 and at Lampedusa Power Plant • It is therefore appropriate to require this for new plants with its operation on the cleaner gas oil providing the basis of the lower BATAEL

• Propose a yearly average BAT-AEL range for existing plants of 125–625 mg/Nm3.	DISAGREE with upper limit	***<u>Note</u>:*** • *At the Intermediate Meeting, we agreed to a request by EURELECTRIC/GREECE to look at whether any separate case could be made for small isolated systems. The EEB submitted data but it appears that no-one else did. Our data supported SCR* • *Malta submitted Plants 362-365 simply as a short case study – the EEB obtained full data through FoI* <u>Upper limit</u> • It is entirely appropriate to base the upper limit on Plants 362-365, for which the EEB submitted annual data obtained through FoI. • However, the rounding up of this data to 140 mg/Nm^3 exaggerates the emissions of plants whose actual emissions are 118, 125,127 and 131 mg/Nm^3 respectively • **<u>The upper BATAEL should therefore be 130 mg/Nm^3</u>** • The proposed upper BATAEL is determined by applying a 75% SCR abatement efficiency to unabated plants, all of which report NOx emissions <2500 mg/Nm^3 • However, no plants with emissions > 2300 mg/Nm^3 should be considered for BAT as this performance exceeds the standard base engine optimised for NOx in production <2000 (see current BREF, Table 6.21, p.379 • This excludes plants commissioned between 1997 and 2004, and leaves plant 181, commissioned 1988, as the reference plant, with reported emissions of 2197 mg/Nm^3 **<u>Continue as from 'correction' below</u>……..** • However, these emissions are half hourly averages, which

• Propose a BAT-AEL range for plants operated in emergency- or peak-load modes or existing plants (1150–1900 mg/Nm3).	DISAGREE	will be higher than hourly ones – an adjustment of 20% to allow for this would leave effective emissions of 1758 mg/Nm^3. • Applying SCR with 75% removal efficiency would result in emissions of 439 mg/Nm^3 • **<u>The upper BATAEL should therefore be 440 mg/Nm^3</u>** ***<u>CORRECTION</u>:*** *The use of 20% reduction due to half hour averages is incorrect because there will be no difference for yearly averages.* • *Therefore it should be 75% removal efficiency applied to 2197 mg/Nm^3* • ***<u>The upper BATAEL should therefore be 550 mg/Nm^3</u>*** ***<u>Note</u>:*** • *The BATAEL includes SISs and the current BREF declines to set a SCR abatement efficiency because of the frequent stops and starts of these systems.* • *This EEB proposed figure is slightly higher than that expected to be achieved at Lampedusa in the future where the potential for SCR retrofitting is limited by <u>available space</u>, so this cannot be used as an excuse.* • The justification for setting less strict standards for peak and emergency plants is that it <u>may</u> be too costly to fit SCR • However, peak load could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators.

		➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
Daily averages • Propose a daily average BAT-AEL range for new plants of 145–160 mg/Nm3.	DO NOT OPPOSE	***Note:*** • *The BP states that the lower limit is to have the same difference between daily and yearly limits as does the upper daily limit for existing plants i.e. 25%. But the difference for existing plants is stated (and calculated) as 20%* • *The actual difference between a yearly limit of 125 mg/Nm^{3}and a daily one of 145 mg/Nm^3 is neither 20% or 25% but the error is in our favour*
• Propose a daily average BAT-AEL range for existing plants of 150–750 mg/Nm3.	DISAGREE with upper limit	• The EEB has made a case for an upper yearly average for existing plants of 440 mg/Nm^3 • The BP proposes a difference between yearly and daily data of 20%, which would be ~530 (528) mg/Nm^3 daily limit for a yearly average of 440 mg/Nm^3 • **The upper BATAEL should therefore be 530 mg/Nm^3**
Monitoring frequency • Keep continuous monitoring.	AGREE	• The majority of the plants considered for the BATAEL use continuous monitoring already.
• Include a footnote for plants operated in emergency- or peak-load modes: periodic monitoring.	DISAGREE for peak load plants	• Both of the TWG peak load plants (427-1 and 427-2) already use continuous monitoring

1.6 Natural gas combustion		
1.6.1 BAT 44 and 45 – Energy efficiency **1.6.1.1 BAT 44 – Energy efficiency**		
<u>General</u> • Do not add 'open-cycle gas turbine' as a new technique.	AGREE	• The lower efficiencies of OCGTs mean that as a general case, even if they were regarded as a separate technique, they could not be justified as a BAT technique
• Include in the applicability of technique (c): 'Not applicable to emergency- and peak-load modes'.	DISAGREE	• There is evidence in the TWG data of CCGTs operating at peak load e.g. Plants 241, 295, 264, 202,195, 271, 214. • This could still represent ~ 37% of base load operation each year
<u>CHP readiness (a)</u> • Remove the technique as it is already mentioned in BAT 7. See also assessment in Section 2.14 of this BP. • Include engines and boilers in the applicability of the technique in BAT 7. • Add that there should be a realistic potential for the future use of heat in the vicinity of the plant.		
<u>Regenerative feed-water heating (b)</u> • Remove the technique. • Change the applicability in BAT 7 to indicate that there are restrictions for existing plants.	} }DO NOT OPPOSE }	• OK if covered elsewhere

CCGT (c) • Change the technique name to 'combined cycle'. • Change the description to only make reference to a more detailed description in Section 10.8. • Change the applicability to indicate applicability restrictions: ➢ in case of operation in emergency- and peak-load modes for new plants, ➢ due to the steam cycle design, ➢ due to the plant layout (space) in the case of retrofit at existing plants.	DISAGREE	• Peak load operation is defined in Annex V of the IED as applying to plants that ➢ had a permit prior to 27th November 2002 or ➢ had applied for a permit by that date and put it into operation by 27th November 2003 • This is not relevant to new plants
1.6.1.2 BAT 45 – Energy efficiency		
Expansion turbines • Add the technique description. • Add an applicability restriction: 'The applicability may be limited by the amount of recoverable energy'.		
1.6.1.3 Table 10.26 – BAT-AEELs for energy efficiency – natural gas **1.6.1.3.1 Table 10.26 – General**		
General • Propose BAT-AEELs for transmission and storage gas-fired plants at 33.5–41 % for existing plants and 36.5–41 % for new plants. Clarify the reference conditions for mechanical drive energy efficiency in 'General		

considerations' based on the definition used in the questionnaire. • Do not set applicability restrictions for old boilers. • Do not consider load variations in the proposed BAT-AEELs based on 'design' values.		
1.6.1.3.2 Table 10.26 – BAT AEELs for energy efficiency – natural gas		
<u>Open-cycle gas turbines (OCGT)</u> • Change the proposed BAT-AEEL for new plants to 36–41.5 %. Change the proposed BAT-AEEL for existing plants to 33–41.5 Change the name of plant category to: 'Gas turbine ≥ 50 MWth • Move footnote (1) just beside 'Net electrical efficiency' in the heading of the corresponding column. <u>Combined cycle gas turbines (CCGT)</u> • CCGT producing power only ➢ Change the name of plant category to: 'CCGT plants ≥ 50 MWth for electricity generation only'. ➢ Change the proposed BAT-AEELs for existing plants to 47–60 %, and to 57–60.5 % for new plants.	DO NOT OPPOSE AGREE	• This is the data presented by TFEE • There is no basis for contesting It • This is good ➢ It gives upper ends of the ranges that we were advocating at the data collection stages ➢ The Bureau rejected a TFEE lower BATAEL of 32.8% because it was not supported by a questionnaire ➢ The lower ends of the BATAEL ranges reasonably reflect the evolution of CCGT efficiencies over time

• CCGT CHP plants – Net electrical efficiency ➢ Do not specify restrictions linked to the load variability. Align the proposed net electrical efficiency BAT-AEELs with those proposed for plants generating electricity only. ➢ Move footnote (2) just beside 'Net total fuel utilisation' in the heading of the corresponding column. Reformulated the footnote consistently throughout the BAT conclusions. ➢ Keep the lower end of the ranges for CHP CCGT plants. • CCGT CHP plants – Net total fuel utilisation ➢ Propose BAT-AEEL for plants of ≥ 600 MWth to 80–95 %.	AGREE	• The lower end of the range reflects a clear divide in the data between plants <69% net total fuel utilisation and >/= 80%. ***Note:*** • *Trying to tighten the lower end above 80% could not achieve above 85% and would look weak in comparison to the 'gap' in the data 69-80%* • *The Bureau used its own 2012 data because it was more comprehensive than TFEE – good*
➢ Change the BAT-AEEL for plants of 50–600 MWth to 67–95 %.	DO NOT OPPOSE	***Note:*** *I considered trying to push the lower end up to 70, but it was achieved by aligning the 2012 data with TFEE. The Bureau has rejected TFEE where it is weak, so there is little case for doing so where it has been judged OK.*
• The BAT-AEELs are not applicable to plants operated		

in emergency- or peak-load modes. • Change the proposed net total fuel utilisation BAT-AEEL for CHP gas engine to: 56–85 %. • Change the proposed net electrical efficiency BAT-AEEL for new boilers to 40–42.5 %. • Reorganise and simplify the BAT-AEELs table to have the net electrical efficiency, net total fuel utilisation and net mechanical energy efficiency BAT-AEELs reported on the same line with footnotes in the heading of the columns mentioning that 1) net electrical efficiency BAT-AEELs apply to CHP plants and plants generating only power, 2) net mechanical energy efficiency BAT-AEELs apply to mechanical drive plants, and 3) net total fuel utilisation BAT-AEELs apply to CHP plants and plants generating only heat.		
1.6.2 BAT 46 – NOX emissions to air from boilers		
<u>Air and/or fuel staging (a)</u> • Keep the applicability as 'generally applicable', • and add in the description (Section 10.8.3) that some old small boilers may require a capacity reduction to allow the space for air staging. <u>Flue-gas recirculation (b)</u> • Keep the technique as 'generally applicable'. <u>(Ultra-)low-NOX burners) (c)</u> • Change the applicability to 'generally applicable' • and move the information about boiler design	AGREE	• Both techniques are already applied to plants >/= 50 MWth e.g. air staging is applied to plant 513, which comprises 2 x 26.5 MWth units

constraints to the description in Section 10.8.3. • Change the name of the technique to Low-NOX burners (LNB). <u>SCR (d)</u> • Change the applicability to reflect that there may be technical and economic constraints for retrofitting plants operated in peak-load mode. • Add an applicability restriction linked to the plant size for plants of < 100 MWth, consistently with other types of boilers • and remove the restriction linked to space availability. <u>SNCR (e)</u> • Change the applicability restriction to mention only restrictions in the case of plants operated in peak- or emergency-load modes with high boiler load variations. <u>New technique</u> • Add the new technique 'reduction of the combustion air temperature' to the list of BAT. • Add its description in Section 10.8 of the BAT conclusions. • Set the applicability of this technique to 'generally applicable' within the constraints given by the process needs. <u>Advanced computerised process control</u> • Change the name of the technique to 'advanced control system' and its applicability for consistency throughout the BREF.		

1.6.3 BAT 47 – NOX and NH3 emissions to air from turbines		
DLN (a) • Keep the description and applicability of the DLN technique unchanged. SCR (b) • Change the applicability to indicate constraints for existing plants operated in peak-load mode. Water or steam injection (c) • Change the applicability to recognise that there are constraints imposed by water availability. • Change the name of the technique to 'Water/steam addition' for consistency throughout the BREF and BAT conclusions. 19. (and 20) Advanced computerised process control (d) • Change the name of the technique to 'advanced control system' and its applicability for consistency throughout the BREF.	DISAGREE	• The BP sees the issue of peak load operation as one of cost • However, this could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques

21. (and 22) LNB (f) • Keep the applicability unchanged.		
1.6.4 BAT 48 – NOX emissions to air from engines		
1.6.5 BAT 49 – CO emissions to air		
1.6.6 BAT-AELs for NOX and CO emissions **1.6.6.1 Table 10.27 – BAT-AELs for NOX and CO – gas turbines** **1.6.6.1.1 General**		
• Keep o proposing BAT conclusions for plants operated in peak- or emergency load mode based on primary techniques. • Assess the load for each plant category. • Do not set a minimum turbine load associated to the proposed BAT-AELs in the case of continuous measurement; set a minimum turbine load of 70 % in the case of periodic measurement for gas turbines.	DISAGREE	• Other load modes use secondary techniques • Peak load could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques

• Keep expressing BAT-AELs in concentrations and propose a correction factor for new plants with high energy efficiency (See section 1.6.6.1.2 of this BP).	AGREE	• Increased efficiency increases temperatures which increase NOx • However, containing this increase is a key feature of the design of plants with higher efficiency (eg. with closed loop cooling systems) and this should be properly reflected in any correction
• Merge the dual fuel- and single fuel-fired CCGTs in the same plant size categories;	AGREE	• There is no clear difference in performance between the two
➢ add a footnote mentioning that the BAT-AELs apply to dual fuel gas turbines when operated in gas mode. ➢ Add a footnote mentioning that the BAT-AEL is 145–250 mg/Nm3 for dual fuel plants when running on oil in emergency-load mode.	AGREE	• This is obvious but necessary when a set of BATAELs apply only to gas-fired plants
• Do not create separate categories for turbines with/without supplementary firing or for CHP turbines, except the one already proposed (turbines with total fuel utilisation of > 75 %, which are CHP plants).	AGREE	• There is no clear difference in performance between the two
• Change the name of 'gas turbine' to 'open-cycle gas turbine (OCGT)' to make it clear that it is not a CCGT.	AGREE	• This is an important differentiation
• Do not propose differentiated BAT-AELs depending on the techniques implemented. Assess by category the merit of specifying which technique (or combination of techniques) could allow the lower and/or upper ends of the proposed BAT-AEL ranges to be achieved in order to give the reader more information, and, if	AGREE	• The focus should be on the BAT technique, and the best performance within that technique

needed, add relevant information through appropriate footnotes. • Do not define further what 'the lower end of the range' means. • Do not add a footnote related to higher levels of emissions when only primary techniques are used. • Set the lower end of the BAT-AELs for CO based on available data, category by category, with < 5 mg/Nm3 as the general lower end of the range for consistency throughout the BAT conclusions. <u>NH3 slip</u> • Change the BAT-AEL for NH3 slip to: < 5–10 mg/Nm3. The proposed BAT-AEL for NH3 emissions to air is shown in BAT 4 bis <u>Averaging periods</u> • Keep expressing BAT-AELs as ➢ yearly averages when continuous monitoring is used, ➢ averages over the year when monitoring periodically with more than three samples/year is used, ➢ averages over the sampling period when monitoring periodically with less than three samples/year is carried out.		***<u>Note</u>:*** *This is vague but the BP cites it as being in accordance with other BAT conclusions and the BREF Guidance*

• Do not set daily average BAT-AELs for CO emissions. <u>Monitoring</u> • As a general rule, keep continuous monitoring for gas turbines ≥ 50 MWth, except when PEMS proves to be a common practice at existing plants.	DISAGREE with any exceptions to continuous monitoring	• Continuous monitoring is used for plants as low as 96 operating hours per year (Plant 229) and across the full capacity range • The BREF is setting <u>Best</u> Available techniques • **<u>Continuous monitoring should therefore be BAT for all plants >/= 50 MWth without exception</u>**
• For plants operated in peak- or emergency-load modes, set periodic monitoring for plants of < 100 MWth with a minimum frequency of twice/yr for peak-load plants and once/yr for emergency-load plants.	DISAGREE for peak load plants	• This is undermined by the reality of reference plant performance. • Plants 342, 341,338 and 344 are all <100 MWth operating at peak loads but already using continuous monitoring. • The BREF is setting <u>Best</u> Available techniques • **<u>Continuous monitoring should therefore be BAT for all peak load plants <100 MWth</u>**

<u>In the following sub-sections, these amendments (amongst others) have been made to the proposed BATAELs across the different size categories</u>

Plant category	**EEB BP**	**Existing Plant BATAELs (mg/Nm^3)**	
		Yearly	**Daily**
OCGT – not in mechanical drive	EEB	6 – 35	7 - 55

– not <500 hours	BP	6 - 50	7 - 55
Gas turbines in mechanical drive – not <500 hours	EEB	6 - 40	7 - 65
	BP	6 - 60	7 - 65
Emergency operation	EEB	-	60 - 85
	BP	-	60 - 140
CCGTs >600 MWth <75% net total fuel utilisation	EEB	10 - 25	18 - 35
	BP	10 - 40	18 - 50
CCGTs >600 MWth >75% net total fuel utilisation	EEB	10 - 30	18 - 45
	BP	10 - 50	18 - 65
CCGTs 50-600 MWth <75% net total fuel utilisation	EEB	10 - 30	35 - 40
	BP	10 - 45	35 - 55
CCGTs 50-600 MWth >75% net total fuel utilisation	EEB	25 - 55	35 - 80
	BP	25 - 55	35 - 80

1.6.6.1.2 Table 10.27 – BAT-AELs for NOX and CO – gas turbines

<u>Existing open-cycle gas turbines excluding plants operated in emergency-load mode and mechanical drive applications</u> ➢ Keep the yearly NOX BAT-AELs (i.e 6-50 mg/Nm^3)	DISAGREE with upper limit	• The proposed upper BATAEL has been set by Plant 16-1, an OCGT that operates at peak load • However, as the BP notes, plants used in mechanical drive can be used in the assessment • Here, peak load plants (341 and 342) are achieving emissions <40 mg/Nm^3 despite the fact that plants in mechanical drive are expected to achieve higher NOx

		emissions • **<u>Allowing for this, the upper yearly average for existing OCGTs should be 35 mg/Nm3</u>**
➢ and change the proposed daily BAT-AELs to 7–55 mg/Nm3 in general.	AGREE with upper limit	• A well run plant should not have daily limits significantly higher than the yearly average • The CCGT plants 'borrowed' to provide a yearly upper BATAEL (i.e. Plants 341, 342) can be reasonably represented by an upper daily BATAEL of 55 mg/Nm^3 • **<u>The upper daily BATAEL is therefore properly represented at 55 mg/Nm</u>**
➢ Add a footnote mentioning that the higher end of the daily BAT-AELs for NOX is 80 mg/Nm3 when plants operate in peak-load mode.	DISAGREE	• Plants 16-1 is achieving 95th % ile emissions of 55 mg/Nm^3 • Plants 490 and 491 achieve 95th %ile emissions of 54 and 51 mg/Nm^3 respectively, whilst operating for 332 and 284 hours. • **<u>There is therefore no basis for any footnote allowing for higher upper daily emissions for peak load plants</u>** • Peak load plants 341 and 342 achieve yearly average emissions of <40 mg/Nm^3 despite operating in mechanical drive which has higher emissions • This accords with US practice where no differentiation is made for peak load plants for acid gases
➢ Add a footnote mentioning that yearly BAT-AELs do not apply when plants operate in peak-load mode.	DISAGREE	• The BP justification for not applying yearly BATAELs to peak load plants is that they are only operating for 1500 hours per year

• CO ➢ Change the proposed yearly CO BAT-AELs to < 5–40 mg/Nm3. ➢ Add a footnote mentioning that the higher end of the BAT-AELs is 80 mg/Nm3 when plants are fitted with water injection for NOX reduction. ➢ Do not set CO BAT-AELs when plants operate in peak-load mode. ➢ Add a footnote mentioning the possibility of reaching higher yearly levels of CO of up to 50 mg/Nm3 in the case of operation at low load (see paragraph 23.).		• However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques

<u>Existing gas turbines for mechanical drive applications excluding plants operated in emergency-load mode</u> • NOx ➢ Keep the proposed yearly NOX BAT-AELs (i.e. 6-60 mg/Nm^3)	DISAGREE with upper limit	• The graph for plants in mechanical drive starts to show a steep increase in NOx emissions after 40 mg/Nm^3, • This means that the proposed upper BATAEL would allow just 2 plants (336 and 338) to increase the BATAEL by 50% compared to that set by the preceding 13 plants • This allows them an excessive influence, especially when these 2 plants are out-performed by 8 plants also operating DLN and including 2 peak load plants (*341 and 342*) • **<u>The upper NOx BATAEL should therefore be 40 mg/Nm^3</u>**
➢ and change the daily BAT-AELs to 7–65 mg/Nm3.	AGREE with upper limit	• A well run plant should not have an excessive difference between the average and 95th % ile data • Plants 341, 340 and 342 all have average NOx emissions of 30-40 mg/Nm^3 and a difference between yearly and 95th % ile data of 9, 24 and 24 mg/Nm^3 respectively • For a yearly average of 40 mg/Nm^3, an upper maximum limit of 65 mg/Nm^3 is not excessive • **<u>Therefore the upper daily limit is appropriately set at 65 mg/Nm^3</u>**
➢ The proposed levels also apply in the case of CCGTs.		

Add a footnote mentioning that yearly BAT-AELs do not apply when plants operate in peak-load mode.	DISAGREE	• The EEB's proposed upper limit for the yearly BATAEL (341) is set by a peak load plant, and includes 1 other (342) • The BP proposed upper yearly limit includes the same 2 peak load plants • Therefore peak load plants are already part of the yearly BATAEL • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
• CO ➢ Change the yearly CO BAT-AELs to < 5–40 mg/Nm3.		
➢ Do not set CO BAT-AELs when plants operate in peak-load mode.	DISAGREE	• The BP proposed upper yearly limit includes plants 341 and 342, both of which are peak load plants • **<u>Therefore peak load plants are already part of the yearly BATAEL</u>**
➢ The proposed levels also apply in the case of CCGTs.		
➢ Add a footnote mentioning the possibility of		

reaching higher yearly levels of CO of up to 50 mg/Nm3 in the case of operation at low load (see paragraph 23.).		
<u>Existing (open- and combined) cycle gas turbines – emergency-load mode</u> • NOx ➢ Propose NOX BAT-AEL to 60–140 mg/Nm3 expressed as a daily average or as an average over the sampling period,	DISAGREE with upper limit	• A well run plant should not have daily data excessively higher than its yearly data • The proposed upper limit reflects the performance of 2 plants – 241 and 251, which use standard combustion and DLN respectively • However, both these techniques are represented by better performing plants • Of these, Plant 229 has excessively high daily emissions compared to the other plants using water injection (490 and 491) • All remaining plants have daily emissions </= 85 mg/Nm^3 • **<u>Therefore the upper daily BATAEL should be 85 mg/Nm^3</u>**
➢ with a monitoring frequency of once/yr or the use of PEMS.	DISAGREE	• 4 of the plants in the sample use continuous monitoring, including a plant operating for only 92 hours per year • The BREF is setting <u>Best</u> Available Techniques • **<u>Therefore continuous monitoring should be BAT for emergency plants</u>**
• CO ➢ Remove the CO BAT-AEL. (of 5-80 mg/Nm^3)		
<u>New (open-cycle) gas turbine:</u>		

• NOx and CO ➢ Keep the proposed yearly BAT-AEL for NOX for all the applications (i.e. 6-35 mg/Nm^3)	DISAGREE with upper limit	• The upper limit appears to have been set by Plant 342 in mechanical drive • However plants 330 – 333 (retrofitted 2010) all achieve <25 mg/Nm^3 despite operating in mechanical drive where emissions are higher • **<u>Therefore the upper limit should be 25 mg/Nm^3</u>**
➢ and change the CO yearly BAT-AEL to < 5–40 mg/Nm3.		
➢ Add a footnote mentioning that the NOX and CO yearly BAT-AELs do not apply when plants operate in peak-load mode.	DISAGREE	• The BP justification for not applying the BATAELs to peak load plants is that they are only operating for 1500 hours per year • However, this could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting <u>Best</u> Available Techniques

		•
<u>CCGTs</u> • NOX ➢ Keep the size categorisation as it is.	Agree	• This seems to properly reflect the dataset
➢ Create a new category for <u>existing CCGTs of ≥ 600 MWth with a net total fuel utilisation ≥ 75 %</u> ➢ and propose the yearly BAT-AEL at 10–50 mg/Nm3	DISAGREE with upper limit	• The proposed upper BATAEL includes all the plants in the dataset > 75% fuel utilisation • However, 4 of the 5 plants in this category would be included in an upper BATAEL of 30 mg/Nm • The other plant (49) is a poorer performing example of the commonly used DLN • **<u>The upper BATAEL for plants >600 MWth with fuel utilisation >75% should therefore be 30 mg/Nm^3</u>**
➢ and a daily BAT-AEL of 18–65 mg/Nm3.	DISAGREE with upper limit	• A well managed plant should not have 95th % ile data excessively above its average • The BP's proposed upper BATAEL has been set by Plant 49, which has higher than normal difference between the yearly and daily data, and is excluded from the EEB's proposal • Better performing plants with yearly emissions of 30 mg/Nm^3 would achieve daily limits within ~45mg/Nm^3 • **<u>Therefore the upper daily BATAEL should be 45 mg/Nm^3</u>**
• Do not propose general separate BAT-AELs for plants		• The IED prioritises pollution prevention over its control

achieving a net electrical efficiency greater than 55 %. See for new plants proposal 35.	AGREE	• It is therefore much better to improve the efficiency of these plants than to formalise low efficiencies with separate BATAELs
• <u>All existing CCGTs</u> ➢ Propose BAT-AELs for NOX and CO based on the available information and data.		
• <u>Existing CCGTs ≥ 600 MWth (*total fuel utilisation of < 75 %)* excluding plants operated in emergency-load mode</u> ➢ Change the NOX yearly BAT-AEL to 10–40 mg/Nm3 (from 10-35) and	DISAGREE with upper limit	• An upper BATAEL of 40 mg/Nm^3 is set by plants 193 and 433 • However, this adds nothing to setting the upper BATAEL at 25 mg/Nm^3 (Plant 10) – all abatement techniques covered by the BP proposal would still be covered • Anything more than 25 mg/Nm^3 is simply duplication of plant types with less well performing ones, and this cannot be BAT • **<u>Therefore the upper BATAEL should therefore be 25 mg/Nm^3 (Plant 10)</u>**
➢ keep the proposed NOX daily BAT-AEL as it is i.e. 18 - 50 mg/Nm^3.	DISAGREE with upper limit	• Nearly all the plants with yearly emissions 25–40 mg/Nm^3 have a difference between the yearly and 95th %ile data of <10 mg/Nm^3 • For plants with yearly emissions 21-25 mg/Nm^3, all such differences are <8 mg/Nm^3 • **<u>Therefore for a yearly average of 25 mg/Nm^3 the upper daily BATAEL should be 35 mg/Nm^3</u>**

➢ Change the proposed CO yearly BAT-AEL to < 5–30 mg/Nm3 ➢ and add a footnote mentioning the possibility of reaching higher yearly levels of CO of up to 50 mg/Nm3 in the case of operation at low load. ➢ This proposal can be generalised for all the types of existing turbines. ➢ Add a footnote mentioning that the NOX and CO yearly BAT-AELs do not apply when plants operate in peak-load mode.	DISAGREE	• There appears to be no explicit justification for this in the BP • However, it is contradicted by plants operating at peak loads but still achieving the EEB's tightened proposed upper BATAEL for NOx e.g. Plants 195, 202 and 264 • It is also contradicted by practice in the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) The BREF is setting Best Available Techniques
• Existing CCGTs of < 600 MWth excluding plants operated in emergency-load mode ➢ Replace 'fuel utilisation' by 'net total fuel utilisation' in the plant categories. ➢ Add a footnote mentioning the possibility of reaching higher yearly levels of CO of up to 50 mg/Nm3 in the case of operation at low load		

(see paragraph 23.).		
• <u>Existing CCGTs of < 600 MWth with a net total fuel utilisation below 75 %</u> excluding plants operated in emergency-load mode ➢ Keep the proposed NOX yearly BATAEL (10-45 mg/Nm^3)	DISAGREE with upper limit	• The proposed upper BATAEL is set at Plant 104 (commissioned 2005) and includes 14 plants fitted with DLN alone • Within these DLN plants, Plant 135 dates back to 1994 but still achieves yearly emissions of 28 mg/Nm^3 • Plant 104 cannot be BAT if a plant 11 years older is performing significantly better • **<u>Therefore the upper yearly BATAEL should be 30 mg/Nm^3 (Plant 135)</u>**
➢ and hourly BAT-AELs.(33-55 mg/Nm^3)	DISAGREE with upper limit	• A yearly BATAEL of 30 mg/Nm^3 is proposed by the EEB, which includes Plant 171a • Plant 171a has 95th % ile data of 40 mg/Nm^3 which is the highest in the proposed yearly BATAEL range • **<u>Therefore for a yearly upper BATAEL of 30 mg/Nm^3 the upper daily BATAEL should be 40 mg/Nm^3</u>**
➢ Align the CO BAT-AELs with those of plants of ≥ 600 MWth.		
➢ Add a footnote mentioning that NOX and CO yearly BAT-AELs do not apply when plants operate in peak-load mode.	DISAGREE	• The BP provides no justification for this • However, peak load operation could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals

		elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
• Existing CCGTs of < 600 MWth with a net total fuel utilisation above 75 % excluding plants operated in emergency-load mode ➢ Change the proposed NOX yearly BAT-AEL to 25–55 mg/Nm3. (from 25-75)	AGREE	• The EEB's assessment of the data agrees with the Bureau's conclusion • The BP's reduction in the upper limit properly excludes plants 153-1 and 153-3, both of which use water injection – as the BP notes, this could be further fitted with SCR to achieve emissions well below 55 mg/Nm^3 • NOx emissions from the DLN plants accord with what would be expected from their age profile • **Therefore the upper BATAEL should be 55 mg/Nm^3** ***Note:*** *I've tried to tighten this but the data will not allow it, so we simply defend the gain already made against inevitable attempts to downgrade it again. Fortunately, this is at the end of a chain of interdependent BATAELs*

➢ Add a footnote to set the higher end of the BAT-AEL range at 75 mg/Nm3 in the event that it would not be possible to further retrofit a plant operated in peak-load mode due to techno-economic reasons.	DISAGREE	• If it is not possible technically to retrofit SCR, then that would be a matter for an Art 15(4) • Beyond that, there is no reason to treat peak load operation any differently, given that it could still represent ~ 37% of base load operation each year • The idea that 1500 hours of annual operation does not justify BATAELs is contradicted by Bureau proposals elsewhere e.g. the Bureau has proposed HCl limits for peak load plants as small as 100 MWth and for NOx emissions from coal-fired plants • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
➢ Change the proposed NOX daily BAT-AEL to 35–80 mg/Nm3.	AGREE	• This properly reflects the daily data for a plant with a yearly average NOx emission of 55 mg/Nm^3 ***Note:*** *This conclusion follows on from the above inability to further reduce the yearly BATAEL*
➢ Change the proposed CO yearly BAT-AELs to < 5–30 mg/Nm3.		

➢ Add a footnote mentioning that NOX and CO yearly BAT-AELs do not apply when plants operate in peak-load mode.	DISAGREE	• There is no reason to treat peak load operation any differently, given that it could still represent ~ 37% of base load operation each year • In the US: ➢ standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100 hours (Mass) • The BREF is setting Best Available Techniques
• All new CCGTs: NOx emissions ➢ merge and change the ranges for all new CCGTs to 10–30 mg/Nm3 as the yearly BAT-AEL	DISAGREE with upper limit	• The EEB has made a case for an upper BATAEL for existing plants of 25 mg/Nm^3 for CCGTs >600 MWth <75% net total fuel utilisation • The new plant upper BATAEL cannot exceed that of an existing plant • **Therefore the upper yearly BATAEL for new plants should be 20 mg/Nm^3**
➢ and 15–40 mg/Nm3 as the daily BAT-AEL.	DISAGREE with upper limit	• The EEB has made a case for an upper daily limit of 35 mg/Nm3 for existing CCGTs >600 MWth <75% net total fuel utilisation • The new plant upper BATAEL cannot exceed that of an existing plant • **Therefore the upper daily BATAEL for new plants should be 35 mg/Nm^3**

➢ Add a footnote to indicate that a correction factor may be applied to the higher end of the range, corresponding to [higher end] x EE / 55 where EE is the net electrical energy efficiency of the plant determined at ISO baseload conditions. ➢ Also add a footnote for new OCGTs to indicate that a correction factor may be applied to the higher end of the range, corresponding to [higher end] x EE / 39 where EE is the net electrical energy efficiency of the plant determined at ISO baseload conditions.		
• All new CCGTs: CO emissions ➢ CO emissions: change the yearly BAT-AELs to < 5–30 mg/Nm3.		
• All new CCGTs: Footnotes ➢ Delete footnote (1). (on peak load operation)	AGREE	• This is being deleted because there is no evidence that peak load plants cannot comply with the BATAELS • The EEB has provided evidence of peak load plants complying with the BATAELs ➢ Further, practice in the US suggests that there is no case for differentiating peak load operation: standards are set according to the plant's physical capacity, not how that plant is used, thereby providing a proper basis for the level playing field always sought by operators. ➢ where any limit is set for emergency operation in terms of hours, this can be 15-300 hours (including ½ hour testing every 2 weeks) or 100

➢ Keep footnote (2). ➢ Add a footnote mentioning that fine-tuning an existing technique to reduce further NOX emissions may lead to CO emission levels at the higher end of the BAT-AEL range for CO		hours (Mass) • The BREF is setting <u>Best</u> Available Techniques
• All CCGTs ➢ Add a footnote applying to all CCGTs, mentioning that when the boiler of a CCGT operates alone (the gas turbine does not operate), the BAT-AELs that apply are those related to boilers. ➢ Do not add an additional footnote for the fuel quality variation.	AGREE	• Under these circumstances it is effectively no longer a CCGT
1.6.6.2 Table 10.28 – BAT-AELs for NOX and CO – boilers and engines **1.6.6.2.1 General**		
<u>TOPICS NOT PRIORITISED</u>		
2.16 BAT 10 – Water usage and waste water volume discharged		
<u>General</u> • Refer to water usage in the BAT statement.	AGREE	• Water 'usage' has a broader scope than 'consumption' and can include recycling etc

• Refer to 'one or a combination of techniques' in the BAT statement. • Add information on the techniques in Chapter 3 of the BREF. • Do not add further clarifications on cooling water. <u>Techniques</u> • Technique a: 'Avoid the use of potable water'. ➢ Remove technique.	AGREE DO NOT OPPOSE THIS	• BAT requires a technique to be applicable across the sector as a whole • None of the techniques can be applied in all situations • Therefore it would not be appropriate to specify the number of techniques that must be applied ***<u>Note</u>:*** *Much as we would like to keep this, it is undermined as a BAT technique by the fact that chemicals often have to be added to water used e.g. in the boiler tubes to achieve the required level of purity.*
• Technique b: 'Use water and drainage systems segregating contaminated water streams'. ➢ Formulate a separate BAT conclusion on waste water segregation with the objective of reducing emissions to water (see CWW and WBP BREF).	NEED FOR MORE CLARIFICATION OF OBJECTIVE	• The Bureau's BP assessment of this technique discusses the fact that it doesn't change the amount of water usage • Its proposal refers to reducing emissions to water • Both are very important, so greater clarification is needed as to exactly what is the purpose and content of the separate BAT conclusion
• Technique c: 'Maximise internal water recycling'. ➢ Reformulate technique (c) in a more general way. Specify that the degree of recycling is limited by the water balance and the purity requirements of the recipient stream.	REFORMULATE AGAIN	• Whilst it is an important part of any BAT conclusion to state any limits to its applicability, this reformulation reads as a list of reasons not to recycle water • It is not clear exactly what is meant by reformulating this technique in a more general way, but that more general

Reformulate the applicability to clarify that the technique is not applicable to waste water from cooling systems operated with seawater or in once-through mode. • Technique d: 'Segregate/reuse non contaminated water streams (e.g. once-through cooling water, rain water)'. ➢ Remove technique. <u>New techniques</u> • Do not add the technique 'Addition of coal/lignite ash to WFGD waste water'. • Add the techniques 'evaporation' and 'dry ash handling'.	AGREE AGREE	way must not lose sight of the very important objective of maximising internal water recycling. • The BP is correct to point out that this technique is already covered by techniques b and c. • This technique creates a waste stream of ash that would otherwise be re-used.