Final Meeting of the Technical Working Group (TWG) for the review of the BAT reference document for Large Combustion Plants (LCP BREF)

Preliminary draft conclusions – Day 7

Scope (1/4) – BP 1.1.2

- The decision on the scope concerning waste co-incineration is not supported by SE, RO, AT, BE, UK, CAN Europe, EEB.
- The decision on the defionition of combustion plant is not supported by FI.

Scope (2/4) – BP 1.1.2

SCOPE

These BAT conclusions concern the following activities specified in Annex I to Directive 2010/75/EU: …

- 5.2: Disposal or recovery of waste in waste co-incineration plants for non-hazardous waste with a capacity exceeding 3 tonnes per hour or for hazardous waste with a capacity exceeding 10 tonnes per day, only when this activity takes place in combustion plants covered under 1.1 above.

In particular, these BAT conclusions cover upstream and downstream activities directly associated to the abovementioned activities including the emission prevention and control techniques applied.

Scope (3/4) – BP 1.1.2

The fuels considered in these BAT conclusions are any solid, liquid and/or gaseous combustible material including:

- solid fuels (e.g. coal, lignite, peat);
- biomass (as defined in Article 3(31) of Directive 2010/75/EU);
- liquid fuels (e.g. heavy fuel oil and gas oil);
- gaseous fuels (e.g. natural gas, hydrogen-containing gas and syngas);
- industry-specific fuels (e.g. by-products from chemical and iron and steel industries);
- waste except for ~~unsorted~~ mixed municipal waste as defined in Article 3(39) and other waste listed in Article 42(2)(a) of Directive 2010/75/EU.

Scope (4/4) – BP 1.1.2

These BAT conclusions do not address the following: …

- disposal or recovery of waste in:
  - waste incineration plants (as defined in Article 3(40) of Directive 2010/75/EU),
  - waste co-incineration plants where more than 40 % of the resulting heat release comes from hazardous waste, ~~and in~~
  - waste co-incineration plants combusting only wastes, except if these wastes are composed at least partially of biomass as defined in Article 3(31)(b)~~(i) to (iv)~~ of Directive 2010/75/EU;

this is covered by the BAT reference document for Waste Incineration.

Waste co-incineration

BAT 70 in Revised Draft 1

General environmental performance (1/8) – BP 1.10.1

- FAQ to be developed on the application of BAT 70 bis.

General environmental performance (2/8) – BP 1.10.1

10.6 BAT conclusions for the co-incineration of waste

Unless otherwise stated, the BAT conclusions presented in this section are generally applicable to combustion plants co-incinerating waste. They apply in addition to the general BAT conclusions given in Section 10.1.

Unless otherwise stated, the BAT-AELs in this section apply when waste is co-incinerated.

When co-incinerating waste, the BAT-AELs set out in the fuel-specific sections apply in relation to those fuels, as well as in relation to the mix of those fuels and the waste co-incinerated, and taking into account BAT 70 bis (paragraph to be clarified).

Waste co-incineration

BAT 70 in Revised Draft 1

General environmental performance (3/8) – BP 1.10.1

BAT 70 In order to improve the general environmental performance of the co-incineration of waste in combustion plants, to ensure stable combustion conditions, and to reduce emissions to air, BAT is to use a combination of the techniques in BAT 4 and of the techniques given below including BAT 70 (a) in all cases.

Waste co-incineration

BAT 70 in Revised Draft 1

General environmental performance (4/8) – BP 1.10.1

Technique		Description	Applicability
a	Waste pre-acceptance and acceptance	Implement a procedure for receiving any waste at the combustion plant according to the corresponding BAT from the Waste Treatment Industries BREF. Acceptance criteria are set for critical parameters such as heating value, water content, ash content, chlorine and fluorine content, sulphur content, nitrogen content, PCB, metals (volatile (Hg, Tl, Pb, Co and Se) and non-volatile (e.g. V, Cu, Cd, Cr, Ni)) and phosphorus and alkaline content (when using animal by-products). Apply quality assurance systems for each waste load to guarantee the characteristics of the wastes co-incinerated and to control the values of defined critical parameters (e.g. EN 15358 for non-hazardous solid recovered fuel)	Generally applicable

Waste co-incineration

BAT 70 in Revised Draft 1

General environmental performance (5/8) – BP 1.10.1

Technique		Description	Applicability
b	Waste choice	Careful selection of waste type and mass flow, together with limiting the percentage of the most polluted waste that can be co-incinerated. Limit mercury and chlorine entering the combustion process as elevated proportions of the waste	Generally applicable

Waste co-incineration

BAT 70 in Revised Draft 1

General environmental performance (6/8) – BP 1.10.1

Technique		Description	Applicability
c	Waste drying	On-site or off-site pre-drying of the waste before introducing it into the combustion chamber, with a view to maintaining the high performance of the boiler	The applicability may be limited by insufficient recoverable heat from the process, by the required combustion conditions, or by the waste moisture content
d	Waste pre-treatment	See techniques described in the Waste Treatment Industries and Waste Incineration BREFs, including milling, pre-combustion in fluidised bed boilers, pyrolysis, gasification, etc.	The applicability may depend on the combustion plant size and configuration, on the type of waste, and on the space availability

Waste co-incineration

BAT 70 in Revised Draft 1

General environmental performance (7/8) – BP 1.10.1

Technique		Description	Applicability
e	Waste mixing with the main fuel	Effective mixing between waste and the main fuel, as a heterogeneous or poorly mixed fuel stream or an uneven distribution may influence the ignition and combustion in the boiler and should be prevented	Mixing is only possible when the grinding behaviour of the main fuel and waste are similar or when the amount of waste is very small compared to the main fuel

Waste co-incineration

BAT 70 in Revised Draft 1

General environmental performance (8/8) – BP 1.10.1

BAT 70 bis In order to prevent increased emissions from the co-incineration of waste in combustion plants, BAT is to take appropriate measures to ensure that the emissions of polluting substances in the part of the flue-gases resulting from waste co-incineration are not higher than those resulting from the application of BAT conclusions for the incineration of waste ~~defined in the WI BREF~~.

Waste co-incineration in coal/lignite plants | BAT 78/Table 10.51 in Revised Draft

Techniques/BAT-AELs for metals (1/5) – BP 1.10.9

- The decision on the BAT-AELs for metal emissions is not supported by CAN Europe, EEB.

Waste co-incineration in coal/lignite plants

BAT 78 in Revised Draft 1

Techniques/BAT-AELs for metals (2/5) – BP 1.10.9

BAT 78: In order to reduce dust and particulate-bound metal emissions to air from the co-incineration of waste with coal and/or lignite, BAT is to use one or a combination of the techniques in BAT 22.

Waste co-incineration in coal/lignite plants

Table 10.51 in Revised Draft 1

Techniques/BAT-AELs for metals (3/5) – BP 1.10.9

Table 10.51: BAT-associated emission levels (BAT-AELs) for metal emissions to air from the co-incineration of waste with coal and/or lignite

Combustion plant total rated thermal input (MW_{th})	BAT-AELs ~~(1)~~		Averaging period
	Sb+As+Pb+Cr+Co+Cu +Mn+Ni+V (mg/Nm^3)	Cd+Tl ($\mu g/Nm^3$)	
< 300	0.005–0.5	5–12	Average over the sampling period
≥ 300	0.005–0.2	5–6	Average of samples obtained during one year

Waste co-incineration in coal/lignite plants

BAT 3 ter in Revised Draft 1

Techniques/BAT-AELs for metals (4/5) – BP 1.10.9

Substance/ Parameter	Fuel/ Process	… thermal input	Standard(s) (1)	Minimum monitoring frequency	Monitoring associated with
Metals and metalloids except mercury (As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Tl, V, Zn)	Waste co-incineration in coal and/or lignite combustion plants	< 300 MW_{th}	EN ISO 14385	At least once every six months (7) (8)	BAT 78
		≥ 300 MW_{th}		At least once every three months (7) (8)	

Waste co-incineration in coal/lignite plants

BAT 3 ter in Revised Draft 1

Techniques/BAT-AELs for metals (5/5) – BP 1.10.9

(7) In the case of plants operated in emergency-load mode, the monitoring frequency may be reduced to at least once every year. In the case of plants operated in peak-load mode, the monitoring frequency may be reduced to at least once every six months.

(8) The monitoring frequency may be reduced if ~~it is demonstrated that~~ the emission levels are proven to be sufficiently stable ~~consistently within the BAT-AELs set~~. In these specific cases, periodic measurements could be carried out each time that a change of the fuel and/or waste characteristics may have an impact on the emissions, but in any case at least once every year.

Waste co-incineration in biomass/peat plants | **BAT 79/Table 10.52 in Rev. Draft 1**

Techniques/BAT-AELs for metals (1/5) – BP 1.10.10

- Add in the chapter on 'Concluding remarks and recommendations for future work' that more information on Mn emissions originating from biomass and/or peat should be collected during the next BREF review.
- The decision on the BAT/AELs and/or monitoring is not supported by CAN Europe, EEB, ESWET.

Waste co-incineration in biomass/peat plants

BAT 79 in Revised Draft 1

Techniques/BAT-AELs for metals (2/5) – BP 1.10.10

BAT 79 In order to reduce dust and particulate-bound metal emissions to air from the co-incineration of waste with biomass and/or peat, BAT is to use one or a combination of the techniques in BAT 29 and of the technique given below.

Technique		Description	Applicability
a	Fuel/waste choice	By switching to a different fuel/waste or modulating the fuel/waste blending (e.g. lower ash fuel/waste) the corresponding emissions can be reduced	Applicable within the constraints associated with the availability of different types of fuel/waste, which may be impacted by the energy and waste management policies of the Member State

Waste co-incineration in biomass/peat plants

Table 10.52 in Revised Draft 1

Techniques/BAT-AELs for metals (3/5) – BP 1.10.10

Table 10.52: BAT-associated emission levels (BAT-AELs) for ~~particulate-bound~~ metal emissions to air from the co-incineration of waste with biomass and/or peat

BAT-AELs (average of samples obtained during one year)	
Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V (mg/Nm^3)	Cd+Tl (µg/Nm^3)
0.075–0.3	~~0.8–~~ < 5

Waste co-incineration in biomass/peat plants

3 ter in Revised Draft 1

Techniques/BAT-AELs for metals (4/5) – BP 1.10.10

Substance/ Parameter	Fuel/ Process	… thermal input	Standard(s) (1)	Minimum monitoring frequency	Monitoring associated with
Metals and metalloids except mercury (As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Tl, V, Zn)	Waste co-incineration in solid biomass and/or peat combustion plants	< 300 MW_{th}	EN ISO 14385	At least once every six months (7) (8)	BAT 79
		≥ 300 MW_{th}		At least once every three months (7) (8)	

Waste co-incineration in biomass/peat plants

3 ter in Revised Draft 1

Techniques/BAT-AELs for metals (5/5) – BP 1.10.10

([7]) In the case of plants operated in emergency-load mode, the monitoring frequency may be reduced to at least once every year. In the case of plants operated in peak-load mode, the monitoring frequency may be reduced to at least once every six months.

([8]) The monitoring frequency may be reduced if ~~it is demonstrated that~~ the emission levels are proven to be sufficiently stable ~~consistently within the BAT-AELs set~~. In these specific cases, periodic measurements could be carried out each time that a change of the fuel and/or waste characteristics may have an impact on the emissions, but in any case at least once every year.

Waste co-incineration

BAT 81/Table 10.54 in Revised Draft 1

Techniques/BAT-AELs for TVOC and PCDD/F (1/6) – BP 1.10.12

- Add in the chapter on 'Concluding remarks and recommendations for future work' that more information on PCDD/F emissions should be collected during the next BREF review in order to review if there is a need to differentiate between biomass/peat versus coal/lignite combustion.
- The decision on the BAT/AELs and/or monitoring is not supported by EEB, CAN Europe, ESWET.

Waste co-incineration

BAT 81 in Revised Draft 1

Techniques/BAT-AELs for TVOC and PCDD/F (2/6) – BP 1.10.12

BAT 81 In order to reduce emissions of volatile organic compounds and polychlorinated dibenzo-dioxins and -furans to air from the co-incineration of waste with biomass, peat, coal and/or lignite, BAT is to use a combination of the techniques in BAT 4 and BAT 29 and given below.

Waste co-incineration

BAT 81 in Revised Draft 1

Techniques/BAT-AELs for TVOC and PCDD/F (3/6) – BP 1.10.12

	Technique	Description	Applicability
a	Activated carbon injection	See description in Section 10.8	Generally applicable
b	Selective catalytic reduction (SCR)	See description in Section 10.8. The SCR system is adapted and larger in comparison with an SCR system only used for NO_X reduction	Generally applicable
c	Rapid quenching through wet scrubbing / flue-gas condenser	See description of wet scrubbing / flue-gas condenser in Section 10.8	Generally applicable

Waste co-incineration

Table 10.54 in Revised Draft 1

Techniques/BAT-AELs for TVOC and PCDD/F (4/6) – BP 1.10.12

Table 10.54: BAT-associated emission levels (BAT-AELs) for PCDD/F and TVOC emissions to air from the co-incineration of waste with biomass, peat, coal and/or lignite

Pollutant	Unit	BAT-AELs	Averaging period
PCDD/F	ng I-TEQ/Nm^3	< 0.01–0.03	Average over the sampling period
TVOC	mg/Nm^3	< 0.1–5	Yearly average
		0.5–10	Daily average

Waste co-incineration

BAT 3 ter in Revised Draft 1

Techniques/BAT-AELs for TVOC and PCDD/F (5/6) – BP 1.10.12

Substance/ Parameter	Fuel/ Process	Combustion plant total rated thermal input	Standard(s) (1)	Minimum monitoring frequency	Monitoring associated with
PCDD/F	Waste co-incineration …	All sizes	EN 1948-1, EN 1948-2, EN 1948-3	At least once every six months (8)	BAT 81

(8) The frequency may be reduced if it is demonstrated that the emission levels are consistently within the BAT-AELs set. In these specific cases, periodic measurements could be carried out each time that a change of the fuel and/or waste characteristics may have an impact on the emissions, but in any case at least once every year. (to be adapted in line with other BATs)

Waste co-incineration

BAT 3 ter in Revised Draft 1

Techniques/BAT-AELs for TVOC and PCDD/F (6/6) – BP 1.10.12

Substance/ Parameter	Fuel/ Process	Combustion plant total rated thermal input	Standard(s) (1)	Minimum monitoring frequency	Monitoring associated with
TVOC	Waste co-incineration …	All sizes	Generic EN standards and EN ISO 13199	Continuous (9)	BAT 81

(9) The monitoring frequency may be reduced if it is demonstrated that the emission levels are consistently within the BAT-AELs set. In these specific cases, periodic measurements could be carried out each time that a change of the fuel and/or waste characteristics may have an impact on the emissions, but in any case at least once every six months.

General BAT conclusions

BAT 11 in Revised Draft 1

Techniques to reduce emissions to water (1/5) – BP 1.2.3

- Specify in the techniques description that anoxic/anaerobic biological treatment for the removal of mercury is applied in combination with other techniques.

Techniques to reduce emissions to water (2/5) – BP 1.2.3

BAT 11 In order to reduce emissions to water from flue-gas treatment, BAT is to use an appropriate combination of the techniques given below, and to use secondary techniques as close as possible to the source in order to avoid dilution.

	Technique	Typical pollutants prevented/abated	Applicability
	Primary techniques		
a	Optimised combustion (see BAT 4) and flue-gas treatment systems (e.g. SCR/SNCR, see BAT 4 bis)	Organic compounds, ammonia (NH_3)	Generally applicable

General BAT conclusions

BAT 11 in Revised Draft 1

Techniques to reduce emissions to water (3/5) – BP 1.2.3

	Technique	Typical pollutants prevented/abated	Applicability
	Secondary techniques (1)		
b	Adsorption on activated carbon	Organic compounds, mercury (Hg)	Generally applicable
c	Aerobic biological treatment	Biodegradable organic compounds, ammonium (NH_4^+)	Generally applicable for the treatment of organic compounds. Aerobic biological treatment of ammonium (NH_4^+) may not be applicable in the case of high chloride concentrations (i.e. around 10 g/l)
(1) The descriptions of the techniques are given in Section 10.8.6.			

Techniques to reduce emissions to water (4/5) – BP 1.2.3

	Technique	Typical pollutants prevented/abated	Applicability
d	Anoxic/anaerobic biological treatment	Nitrate (NO_3^-), nitrite (NO_2^-), Mercury (Hg)	Generally applicable
e	Coagulation and flocculation	Suspended solids	Generally applicable
f	Crystallisation	Metals and metalloids, sulphate (SO_4^{2-}), fluoride (F^-)	Generally applicable
g	Filtration (e.g. sand filtration, microfiltration, ultrafiltration)	Suspended solids, metals	Generally applicable
h	Flotation	Suspended solids, free oil	Generally applicable
i	Ion exchange	Metals	Generally applicable

General BAT conclusions

BAT 11 in Revised Draft 1

Techniques to reduce emissions to water (5/5) – BP 1.2.3

	Technique	Typical pollutants prevented/abated	Applicability
j	Neutralisation	Acids, alkalis	Generally applicable
~~k~~	~~Oil/water separation~~	~~Free oil~~	~~Generally applicable~~
l	Oxidation	Sulphide (S^{2-}), sulphite (SO_3^{2-})	Generally applicable
m	Precipitation	Metals and metalloids, sulphate (SO_4^{2-}), fluoride (F^-)	Generally applicable
n	Sedimentation	Suspended solids	Generally applicable
o	Stripping	Ammonia (NH_3)	Generally applicable

General BAT conclusions

Table 10.1 in Revised Draft 1

BAT-AELs for emissions to water (1/9) – BP 1.2.3

- 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.
- 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.
- Add in the chapter on 'Concluding remarks and recommendations for future work' that more information on biological treatment techniques should be collected during the next BREF review.
- Add in the BREF information on the latest developments on the use of membrane filtration.
- The decision on the BAT-AELs for emissions to water is not supported by EEB, CAN Europe, Eurelectric.

BAT-AELs for emissions to water (2/9) – BP 1.2.3

Emission levels associated with the best available techniques (BAT-AELs) for emissions to water

Emission levels associated with the best available techniques (BAT-AELs) for emissions to water given in these BAT conclusions refer to concentrations, expressed as mass of emitted substances per volume of water, and expressed in µg/l, mg/l, or g/l. The BAT-AELs refer to 24-hour flow-proportional composite samples, ~~taken with the minimum frequency set for the relevant parameter and under normal operating conditions.~~ Time-proportional sampling can be used provided that sufficient flow stability is demonstrated.

BAT-AELs for emissions to water (3/9) – BP 1.2.3

BAT-associated emission levels

The BAT-associated emission levels (BAT-AELs) are given in Table 10.1.

The BAT-AELs refer to direct discharges to a receiving water body at the point where the emission leaves the installation.

General BAT conclusions

Table 10.1 in Revised Draft 1

BAT-AELs for emissions to water (4/9) – BP 1.2.3

Table 10.1: BAT-AELs for direct discharges to a receiving water body from flue-gas treatment.

Substance/Parameter	BAT-AELs
	Daily average
Total organic carbon (TOC)	20–50 mg/l (1) (4) (5)
Chemical oxygen demand (COD)	60–150 mg/l (1) (4) (5)
Total suspended solids (TSS)	10–30 mg/l
Fluoride (F^-)	10–25 mg/l (5)

(1) Either the BAT-AEL for TOC or the BAT-AEL for COD applies. TOC monitoring is the preferred option because it does not rely on the use of very toxic compounds.

(4) Subtraction of COD + TOC intake loads (to be rephrased)

(5) These BAT AELs only apply to wastewater from the use of wet FGD.

General BAT conclusions

Table 10.1 in Revised Draft 1

BAT-AELs for emissions to water (5/9) – BP 1.2.3

Substance/Parameter	BAT-AELs
	Daily average
Sulphate (SO_4^{2-})	1.3–2.0 g/l (2) (3) (5) (6)
Sulphide (S^{2-}), easily released	0.1–0.2 mg/l (5)
Sulphite (SO_3^{2-})	1–20 mg/l (5)

(2) The BAT-AEL only applies to plants using calcium compounds in flue-gas treatment.

(3) The upper end of the range may not apply in the case of high salinity of the waste water (e.g. chloride concentrations ≥ 5 g/l) due to the increased solubility of calcium sulphate.

(6) This BAT AEL does not apply to discharges to sea- or brackish water bodies

General BAT conclusions

Table 10.1 in Revised Draft 1

BAT-AELs for emissions to water (6/9) – BP 1.2.3

Substance/Parameter		BAT-AELs Daily average
Metals and metalloids	As	10–50 µg/l
	Cd	2–5 µg/l
	Cr	10–50 µg/l
	Cu	10–50 µg/l
	Hg	~~0.5–5~~ 0.2–3 µg/l
	Ni	10–50 µg/l
	Pb	10–20 µg/l
	Zn	50–200 µg/l

The associated monitoring is in BAT 3 quater.

General BAT conclusions

BAT 3 quater in Revised Draft 1

BAT-AELs for emissions to water (7/9) – BP 1.2.3

Substance/Parameter	Standard(s)	Minimum monitoring frequency	Monitoring associated with
Total organic carbon (TOC)	EN 1484	At least once every month	BAT 11
Chemical oxygen demand (COD)	No EN standard available		
Total suspended solids (TSS)	EN 872		
Fluoride (F^-)	EN ISO 10304-1		
Sulphate (SO_4^{2-})	EN ISO 10304-1		
Sulphide, easily released (S^{2-})	No EN standard available		
Sulphite (SO_3^{2-})	EN ISO 10304-3		

General BAT conclusions

BAT 3 quater in Revised Draft 1

BAT-AELs for emissions to water (8/9) – BP 1.2.3

Substance/ Parameter		Standard(s)	Minimum monitoring frequency	Monitoring associated with
Metals and metalloids	As	Various EN standards available (e.g. EN ISO 11885 or EN ISO 17294-2)	At least once every month	BAT 11
	Cd			
	Cr			
	Cu			
	Ni			
	Pb			
	Zn			
	Hg	Various EN standards available (e.g. EN ISO 12846 or EN ISO 17852)		

General BAT conclusions

BAT 3 quater in Revised Draft 1

BAT-AELs for emissions to water (9/9) – BP 1.2.3

Substance/ Parameter	Standard(s)	Minimum monitoring frequency	Monitoring associated with
Chloride (Cl^-)	Various EN standards available (e.g. EN ISO 10304-1 or EN ISO 15682)	At least once every month	—
Total nitrogen	EN 12260		—

Energy Efficiency: Type of BAT conclusions (1/3) – BP 1.1.5

Energy efficiency levels associated with the best available techniques (BAT-AEELs)

An energy efficiency level associated with the best available techniques (BAT-AEEL) refers to the ratio between the plant's net energy output(s) and the plant's fuel/feedstock energy input at actual unit design. The net energy output(s) is determined at the combustion, gasification, or IGCC unit ~~plant~~ boundaries and for the unit ~~plant~~ operated at full load ~~maximum continuous rating (MCR) conditions~~. …

Energy Efficiency: Type of BAT conclusions (2/3) – BP 1.1.5

... In the case of combined heat and power (CHP) plants, the net total fuel utilisation BAT-AEEL refers to the combustion unit including the flue gas treatment ~~plant~~ being operated at full load ~~simultaneously for both~~ on heat and maximum remaining power. ~~, and~~ The net electrical efficiency BAT-AEEL refers to the combustion plant generating only electricity at MCR. The net mechanical energy efficiency ~~refers to the integral (over a given period of time) of the differential of pressure (in Pascal) multiplied by the corresponding volumetric flow rate of the gas/liquid (in cubic metre per second) driven~~ is evaluated at full load as the ratio between mechanical power at load coupling and thermal power supplied by fuel.

BAT-AEELs are expressed as a percentage of the fuel/feedstock energy input (as lower heating value, LHV).

If … cannot be demonstrated for technical reasons, it may be calculated. (to be rephrased)

Energy Efficiency: Type of BAT conclusions (3/3) – BP 1.1.5

~~For averaging periods, the following **definitions** apply:~~

~~Averaging period~~	~~Definition~~
~~Yearly average~~	~~For net electrical efficiency: ratio between the net electrical output (electricity produced at alternator terminals minus imported energy) and fuel/feedstock energy input (as the fuel/feedstock lower heating value) at the combustion plant boundary over a period of one year.~~ ~~For net total fuel utilisation: ratio between the net produced energy (electricity, hot water, steam, mechanical energy produced minus imported electrical and/or thermal energy) and fuel energy input (as the fuel lower heating value) at the combustion plant boundary over a period of one year~~

Energy Efficiency: Monitoring (1/2) – BP 1.1.5 and 1.2.1.3

BAT 3 BAT is to determine ~~monitor~~ the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the gasification and/or combustion plants by ~~periodically~~ carrying out a performance test~~s~~ at full load, according to EN standards, after the commissioning of the plant and after each modification that could significantly affect the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the plant. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality. ~~A performance test is carried out in particular after the commissioning of the plant and after each modification that could significantly affect the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the plant.~~

Energy Efficiency: Monitoring (2/2) – BP 1.1.5 and 1.2.1.3

~~**Applicability**~~

~~Monitoring of the net electrical efficiency applies only to plants generating only power, to CHP and to IGCC plants. Monitoring of the net total fuel utilisation applies only to plants generating only heat, to CHP and to gasification plants (including IGCC plants). Monitoring of the net mechanical drive efficiency only applies to plants used for mechanical drive applications.~~