



Workshop on Implementation of BAT Conclusions for Waste Incineration

WI BREF and BAT conclusions:
review, content and what is unsaid

Lorenzo Ceccherini



11:45-12:30: WI BREF and BAT conclusions: review, content and what is unsaid

- Waste incineration milestones
- The data collection phase
- Data analysis
- Structure of the document
- Different kinds of BAT conclusions:
 - General BATs, BATs on monitoring, Energy efficiency, Resource efficiency, BATAE(P)Ls
- Main issues for the implementation
- Waste Incineration BREF & BAT conclusions – Content / Unsaid



Revision of the Waste incineration BREF – Milestones 1/2

- 19-22/1/2015: **Kick-off Meeting in Seville**
 - 86 TWG members - TWG's first "conclusions"
- March-June 2015, Discussion on **focused approach**:
 - **3 Groups of pollutants (Key Environmental Issues):**
Addressed/ Possibly addressed/ Not addressed
- 9/2015: **List of well-performing plants/lines** participating in data collection (~ 500)
- 11/1/2016: EIPPCB's **questionnaire to operators for data collection (ref. year: 2014)**
 - **Complementary questionnaire by Industry** on monitoring
- 15/4/2016: **Questionnaire return**, after validation by Member States
 - ~ **350 lines** reported around **45 million individual data** (all ½-hr average)
- 24/5/2017: **First draft** of the revised WI BREF
- 23/2/2018: **Pre-final WI BAT-conclusions** draft with Background paper
- 23-27/4/2018: **Final meeting** of TWG in Seville
- 28/9/2018: **Pre-final WI BREF** (complete BREF)
- 14/12/2018: **Final WI BREF Draft**

Also:

- Meetings/conf. calls of sub-groups on Questionnaire, Residues, Energy, OTNOC
- Presentations on uncertainty
- Visit of W-t-E and IBA plants, of an instrument supplier and of INERIS test bench



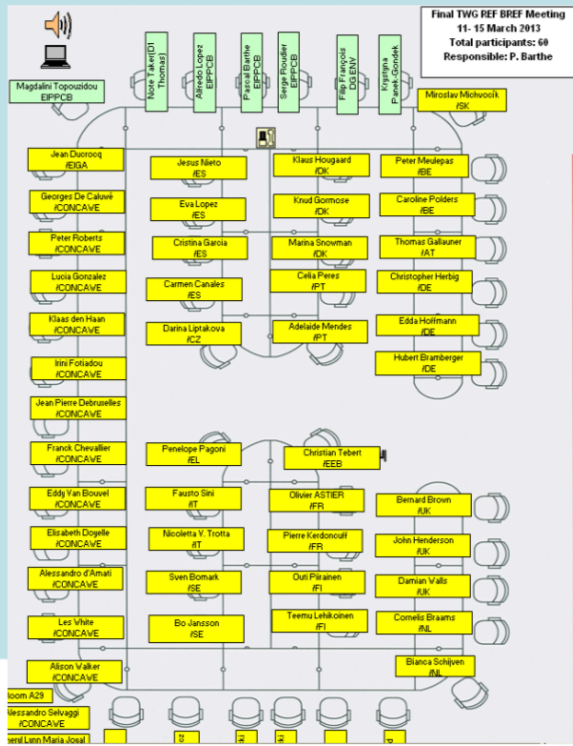
Revision of the Waste incineration BREF – Milestones 2/2

- 27/2/2019: Final draft WI BREF presented to **IED Article 13 Forum** for discussion (opinion only). Only “consensual” comments accepted. Minor changes.
- 17/6/2019: IED Article 75 Committee vote on draft Commission Implementing Decision on BAT conclusions for WI (Member States)
- Mid-2019: Publication of only the BAT conclusions in Official Journal of EU **translated** in 23 EU languages
⇒ **Implementation before mid 2023** (4 years)
- End 2019: Complete **WI BREF** (only in English) published on **EIPPCB website** as a JRC Science for Policy Report

- **WI BREF:** Waste Incineration BAT Reference document
- **EIPPCB - JRC:** European IPPC Bureau, part of the Joint Research Centre in Seville office. (Technical Office of the European Commission coordinating BREF reviews)
- **TWG:** Technical Working Group set up by the European Commission to review BREFs
- **MSs:** Member States

Revision of the Waste incineration BREF

• 'Marathon' plenary TWG meetings



- **50 to 140 experts**
 - 5 to 9 from COM
- **3 to 7 full meeting days**
 - 8 to 14 hours per day
- **Detailed background paper**
(50 to 320 pages)
- **90 to 330 concluding slides**
- **High pressure**



Data collection



Operators returned 355 questionnaires on “well performing” lines (not plants) to MSs

- Filled-in with operating data of 2014
 - Measured data corrected for P, T, 11% O₂ dry (except German plants, not corrected for O₂ if < 11%)
 - Without subtraction of the uncertainty
- For continuously monitored pollutants: 17.520 ½-hr average values
 - (HCl, HF, SO₂, NO_x, Dust, CO, TOC) + (Hg, NH₃)
- Periodically monitored values
 - Metals, PCDD/F, PCB-DL,...
- Data on Energy efficiency of the plant and of the line

- **Plants vs. lines:** an incineration plant includes one or several incineration lines, plus common equipment (TG set, DH exchangers, ...)
- **MSs:** Member States
- **EIPPCB:** European IPPC Bureau
- **TWG:** Technical Working Group

MSs checked the validity of the data (?) before sending them to the EIPPCB (and the TWG)

EIPPCB asked questions to operators

Answers were validated (?) by MSs before being sent to EIPPCB



Data collection



Popular questions: why so many data? Why not simply collect averages, 97th and max daily averages of the year?

EIPPCB organised a meeting to finalise the questionnaire template, where they wanted to have only daily averages in NOC collected. The associations explained that this was not possible due to the EOT requirement in IED, Annex VI. The only solution found was to then collect everything and make a selective filter to take out OTNOCs.



Data collection – type of furnace vs type of waste, number of lines

	Municipal & similar waste	Other non hazardous waste	Sewage sludge	Hazardous waste	Clinical waste	Total
Grate furnace	205	50	0	6	0	261
Fluidised bed	12	13	17	0	0	42
Rotary kiln	4	0	1	31	0	36
Gasification	1*	0	0	0	1	2
Other	1	0	0	7	2	10
Total	223	63	18	44	3	351

*Gasification of pretreated Solid Recovered Fuel (SRF) mixed with waste wood



Data collection - OTNOC status to be reported

OTNOC status of the lines was requested on the 17.520 rows of the half-hourly average emissions to air

- Done manually by operators
- OTNOCs: Stopped, Start-up & Shut-down (without & with waste burning), Breakdown, Failures, Maintenance, Testing, Other exceptional conditions

Status abbreviations to be reported by operators on 2014 continuously monitored data

- **OTNOC: Other Than Normal Operating Conditions**

AUX	Auxiliary fuel operation: when only auxiliary fuels are burned, as no waste is fed into the furnace or is being burned in the furnace
WSTART	Waste feeding start: period of time when waste is fed into the furnace but the energy provided by the waste is not yet enough to sustain the minimum load for stable conditions
WSHUT	Waste feeding shutdown: period of time when waste is not anymore fed into the furnace, but waste is still burning in the furnace
BREAK	Breakdown (as per IED Art. 47)
BYP	Bypassing of abatement system
FAILABA	Failure, malfunction or leaks of abatement system
FAILPRO	Failure, malfunction or leaks of process equipment
FAILMON	Failure or malfunction of monitoring devices. FAILMON is used also when the malfunctioning affects the measurement of some but not all the parameters. In this case please leave a blank the cell of the parameter(s) affected and specify which device is not working in the additional information column.
MAINT	Regular maintenance
TEST	Testing of new fuels/techniques/reagents
STOP	Line not in operation
OTH	Other exceptional conditions
	If none of the conditions of the list above are selected, the reference line is considered to be in normal operation

List of not normal operations that operators were requested to identify for each 1/2-hr period when filling in the Questionnaire (See Instructions in Annex III of the Questionnaire)

Data processing - JRC-EIPPCB data filters

- JRC-EIPPCB defined 8 filters and used 6 of them

Filters	
Operating parameters	
OP	Half-hourly periods discarded if flue gas temperature less than required (850°C or other) or flow rate too low. This filter aims at discarding values when plant is out of operation
Operating conditions	
OC1	Half hourly periods discarded when AUX, WSTART, WSHUT, BREAK, BYP, FAILABA, FAILPRO, FAILMON, MAINT, TEST, STOP or OTH is reported
OC2	Half hourly periods discarded when AUX, BREAK, FAILMON, MAINT or STOP is reported
Exceedances of half-hourly ELVs	
ELV	Half-hourly periods are discarded when a half-hourly ELV as set in the permit is exceeded.
Minimum number of valid half-hourly periods in the day	
43	Days are discarded when less than 43 valid half-hourly periods are counted. For this purpose, a period is considered invalid when filtered out by any of the defined half-hourly filters that are in use for the specific filtering combination
Statistical outliers	
O30	The 60 half-hourly periods corresponding to the 30 hours of the year with the highest emissions of each pollutant are discarded

- ... and selected 3 combinations of filters
 - OC2, OP: corresponding to “daily base”, which is what the EIPPCB considered R-EOT
 - OC1, OP, ELV, 43: corresponding to “daily fine”, which is what the EIPPCB considered NOC
 - OC2, OP, O30: corresponding to “half-hourly base”



Data filtering and processing

- JRC-EIPPCB graphs are in Annex 8.6 of the Final Draft of WI BREF
“Daily base” and “daily fine” maxima (+ yearly average) with ELVs and techniques applied

- ∨ 8 ANNEXES
 - 8.1 Costs of some air emissions monitoring systems
 - > 8.2 Energy efficiency calculation examples
 - 8.3 Example of a multi-criteria assessment used for the selection of FGC systems
 - 8.4 List of European waste incineration plants that participated in the 2016 data collection
 - 8.5 List of European bottom ash treatment plants that participated in the 2016 data collection
 - 8.6 Daily and yearly average emission levels achieved by the waste incineration plants reporting continuously monitored emissions in the 2016 data collection: detailed graphs
 - 8.7 Half-hourly and monthly average emission levels achieved by the waste incineration plants reporting continuously monitored emissions in the 2016 data collection: detailed graphs
 - 8.8 Emission levels achieved by the waste incineration plants reporting periodically monitored emissions in the 2016 data collection: detailed graphs
 - 8.9 Comparison of PCDD/F emission levels measured by short-term and long-term sampling at 142 waste incineration reference lines in Belgium and France



Reminder: BATAELs expressed as ranges

According to the BREF guidance (Comm. decision “2012/119/EU”) pp.62-63:

- *“The environmental performance levels associated with BAT **will be expressed as ranges**, rather than as single values. A range may reflect the differences within a given type of installation (e.g. differences in the grade/purity and quality of the final product, differences in design, construction, size and capacity of the installation) that result in variations in the environmental performances achieved when applying BAT.*
- *It is preferable to use a true range rather than an expression of the type ‘< X’, because this gives less information. It is acceptable to use an expression of the type ‘< X to Y’ (i.e. ‘< X’ for the lower end of the range, Y for the upper end), **where the lower end of the range cannot be accurately defined, e.g. when the data reported in the information exchange is close to the detection limit.***
- *The EIPPCB and the TWG will **assess the data** collected during the exchange of information (see Chapter 5) **to derive both the lower and the upper end** of the range.*

< X:
Close to
detection
limit

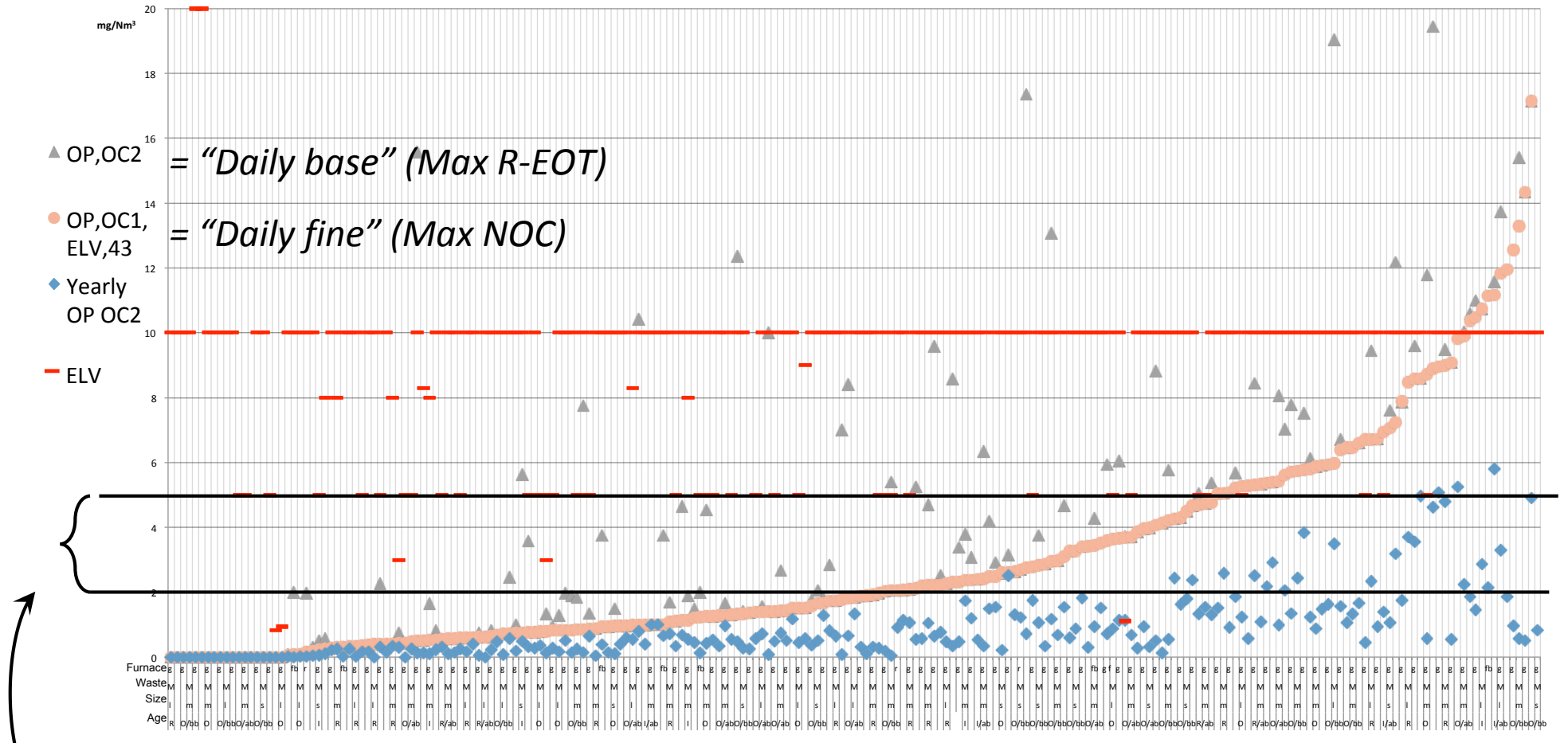


BATAELs are directly derived from operating values

- BATAELs are directly based on operating data reported by plant operators
 - **No margin** included to take into account that BATAELs are future ELVs
 - **Uncertainty** on reported values **not taken into account**
- Method to derive BATAELs not known
 - *“The derivation of sound BAT-AE(P)Ls cannot result from a mere statistical assessment of the emission values reported in the filled-in questionnaires using an algorithm”.*
 - *“For defining the lower end of the range, it is necessary to take the performance of plant(s) achieved under normal operating conditions by the BAT obtaining the best environmental performance as provided in the information exchange The upper end of the BAT-associated environmental performance level range is derived by considering the range of performance associated with the application of the BAT under normal operating conditions.”*



BATAELs are directly derived from operating values, e.g.



BATAEL range: < 2 to 5 mg/Nm³

Dust maximum daily averages and yearly averages for MSWI

Outcome of the review

WI BREF Final draft (14th December 2018)

- 749 pages, 7 chapters + Introduction & Annexes



- 🔖 PREFACE
- 🔖 SCOPE
- > 🔖 1 GENERAL INFORMATION ON WASTE INCINERATION
- > 🔖 2 APPLIED PROCESSES AND TECHNIQUES
- > 🔖 3 CURRENT EMISSION AND CONSUMPTION LEVELS
- > 🔖 4 TECHNIQUES TO CONSIDER IN THE DETERMINATION OF BAT
- > 🔖 5 BEST AVAILABLE TECHNIQUES (BAT) CONCLUSIONS
- > 🔖 6 EMERGING TECHNIQUES
- 🔖 7 CONCLUDING REMARKS AND RECOMMENDATIONS FOR FUTURE WORK
- > 🔖 8 ANNEXES
- > 🔖 9 GLOSSARY
- 🔖 10 REFERENCES

WI BAT conclusions (as in Chapter 5 of Final Draft of WI BREF)

- Written as a stand-alone document, Implementing decision of the Commission
- Includes Scope, Definitions, Acronyms, General considerations and descriptions of techniques
- 37 BAT conclusions (BAT-c)
 - BAT-c 1 on Environmental management system
 - BAT-c 2-8 on monitoring: Energy efficiency, key parameters, channelled emissions to air and water, emissions during OTNOC, content of unburnt substances and POP content in output stream
 - BAT-c 9-18 on General environmental and combustion performances
 - BAT-c 19-20 on energy efficiency → Including BATAEELS
 - BAT-c 21-31 on emissions to air → Including BATAEELS
 - BAT-c 32-34 on emissions to water
 - BAT-c 35-36 on material efficiency
 - BAT-c 37 on noise

- **BATAEL**: BAT Associated Emission Levels
- **BATAEELS**: BAT Associated Energy Efficiency Level

5 BEST AVAILABLE TECHNIQUES (BAT) CONCLUSIONS

- Scope
- Definitions
- Acronyms
- General considerations
- 5.1 BAT conclusions
 - 5.1.1 Environmental management systems
 - 5.1.2 Monitoring
 - 5.1.3 General environmental and combustion performance
 - 5.1.4 Energy efficiency
 - 5.1.5 Emissions to air
 - 5.1.5.1 Diffuse emissions
 - 5.1.5.2 Channelled emissions
 - 5.1.5.2.1 Emissions of dust, metals and metalloids
 - 5.1.5.2.2 Emissions of HCl, HF and SO₂
 - 5.1.5.2.3 Emissions of NO_x, N₂O, CO and NH₃
 - 5.1.5.2.4 Emissions of organic compounds
 - 5.1.5.2.5 Emissions of mercury
 - 5.1.6 Emissions to water
 - 5.1.7 Material efficiency
 - 5.1.8 Noise
 - 5.2 Descriptions of techniques



WI BREF scope

- Waste **Incineration** plants and **co-incineration** plants whose main purpose is not the production of material products (i.e. excludes cement kilns) + other conditions (combust only waste but not biomass of Article 31(3)(b) or MSW)
Both disposal or recovery*
 - Non-hazardous waste, > 3 t/hr
 - Hazardous, > 10 t/d
- Incineration bottom ash treatment,
 - > 50 t/hr, if disposal
 - > 75 t/hr, if recovery or a mix of recovery and disposal

* Although not mentioned in clear the WI BREF covers:

Municipal Solid waste (MSW), Other Non Hazardous waste (ONHW) such as Commercial & Industrial waste (C&I), Sewage sludge incinerated alone or with other waste, Clinical waste (haz. and non-haz.), Hazardous waste



WI BREF scope

Definitions of incineration and co-incineration in WI BAT conclusions refer to definitions in IED Article 3(40) and 3(41) which says that:

Incineration and co-incineration include "pyrolysis, gasification or plasma process, if the substances resulting from the treatment are subsequently incinerated."

These techniques are therefore covered by the WI BREF if this condition is fulfilled, unless they are classified as co-incineration with the main purpose of material production. In this case they are excluded and not covered in any BREF.

Out of scope

- Pre-treatment of waste prior to incineration
- Treatment of incineration fly ashes and other residues resulting from flue-gas cleaning (FGC).
- Incineration or co-incineration of exclusively gaseous waste.
- Treatment of waste in plants covered by Article 42(2) of IED (radioactive waste, animal carcasses, ...)

Some co-incinerators burning **RDF/SRF** partially composed of **non-municipal non-C&I** biomass (e.g. some wood waste) **may be under LCP BREF or in no BREF** (Discussion at the Forum on 27/2/2019)



Key Environmental Issues (KEIs)

- in the context of this WI BREF review*
 - **KEIs**: NO_x, NH₃, Hg, PCDD/F, Dust/metals, PCB-DL, HCl, SO₂
 - **Non KEIs**: HF, TVOC, CO, CO₂, CH₄, N₂O, PM₁₀ and PM_{2.5}, PCBs & PAHs, emissions to water
- EIPPCB proposal for the prioritisation of pollutants
 - for **KEIs** higher and lower ends of proposed BAT-AEL ranges are based on the analysis of the collected plant-specific data;
 - for **non-KEI** for which an **ELV is set in the IED** (HF, TVOC and CO**), only lower end is based on collected data. Higher end set at the **IED Annex VI ELV**;
 - for **non-KEI** for which **no ELV is set in the IED** (CO₂, CH₄, N₂O, PM₁₀ and PM_{2.5}, PCBs & PAHs), **no BAT-AELs are proposed**

** : CO, recognised by the TWG at Kick-off meeting as only an operating parameter

*D1 background paper 'EIPPCB reflections on some Key issues ...', 24/5/2017



Draft WI BAT Conclusion - Definitions

Term	Definition
	General terms
Bottom ash treatment plant	Plant treating slags and/or bottom ashes from the incineration of waste in order to separate and recover the valuable fraction and to allow the beneficial use of the remaining fraction. This does not include the sole separation of coarse metals at the incineration plant.
Existing plant	A plant that is not a new plant.
Major plant upgrade	A major change in the design or technology of a plant with major adjustments or replacements of the process and/or abatement technique(s) and associated equipment.
New plant	A plant <u>first permitted following the publication</u> of these BAT conclusions or a complete replacement of a plant following the publication of these BAT conclusions.
Valid half-hourly average	A half-hourly average is considered valid when <u>there is no maintenance or malfunction of the automated measuring system.</u>
Fly ashes	Particles from the combustion chamber or formed within the flue-gas stream that are transported in the flue-gas.



Draft WI BAT Conclusion - Main new requirements

- Continuous sampling of PCDD/F or PCDD/F + PCB-DL once every month + BATAELs (BAT 30)
 - Exemptions for DL-PCB, if DL-PCB < 0,01 ng/Nm³
for PCDD/F (and DL-PCB), if “*the emission levels are proven to be sufficiently stable*” (BAT 30)

➡ In this case, periodic measurement at least every 6 months

- Continuous Hg monitoring + BATAELs (BAT 31)
 - Exemption if “*waste with a proven low and stable mercury content*”

➡ Continuous measurement replaced for these plants by:

- Either long-term sampling (with lower BATAELs, 1-10 µg/Nm³)
- Or periodic measurement at least every 6 months
- No exemption for plants < 100.000 t/y (originally proposed)
- Continuous monitoring of NH₃ + BATAELs (BAT 29)
- NO_x BATAELs: 50-120 (new), 50-150 (existing) or 180 if SCR not applicable
 - No difference for small plants as in IED Annex VI (< 6 t/h)



Draft WI BATAELs vs. IED Annex VI daily continuous ELVs - 1/2

Air emission at stack		IED Annex VI daily and periodic ELVs			BATAELs (WI BREF draft 12/2018)		
Substance	Unit (11% O ₂ , dry)	IED ELV	Max. Conf. interval ¹	Sampling period	NEW plants	EXISTING plants	Sampling period
Dust	mg/Nm ³	10	3	Daily	<2-5		Daily
TVOC	mg/Nm ³	10	3	Daily	<3-10		Daily
CO	mg/Nm ³	50			10-50		Daily
HCl	mg/Nm ³	10	4	Daily	<2-6	<2-8	Daily
HF	mg/Nm ³	1	0,4	Daily	<1		Daily ²
SO ₂	mg/Nm ³	50	10	Daily	5-30	5-40	Daily
NO _x (SCR, SNCR...)	mg/Nm ³	200	40	Daily	50-120	50-150	Daily
SNCR, if SCR not possible					up to 180		
NH ₃ (SCR or SNCR) (Exist. SNCR not wet)	mg/Nm ³				2-10	2-10 (15)	Daily
Hg	µg/Nm ³	50		Periodic, short term	<5-20		Daily ^{3,4}
					1-10		Long term sampling ³
					<5-20		Periodic, short term ³

⁽¹⁾: According to IED Annex VI, Part 8, Section 1.2, the value of the confidence interval should be subtracted from the measured values to determine the half-hourly average values and then the daily average values.

⁽²⁾: HF continuous measurement may be replaced by periodic measurements if HCl emission are proven to be sufficiently stable.

⁽³⁾: Hg continuous measurement may be replaced by long-term sampling or periodic measurements if incinerated waste Hg content proven low and stable (e.g. mono-streams of waste of a controlled composition).

⁽⁴⁾: Hg ½_hr average indicative value (not BATAELs) for new plants 15-35 µg/Nm³, for existing 15-40 µg/Nm³.



Draft WI draft BATAELs vs. IED Annex VI daily continuous ELVs - 2/2

Air emission at stack		IED Annex VI daily and periodic ELVs			BATAELs (WI BREF draft 12/2018)		
Substance	Unit (11% O ₂ , dry)	IED ELV	Max Conf. interval ¹	Sampling period	NEW plants	EXISTING plants	Sampling period
PCDD/F ⁵	ng I-TEQ/Nm ³				<0.01-0.06	<0.01-0.08	Long term sampling ⁶
PCDD/F + PCB-DL ⁵	ng I & WHO-TEQ/Nm ³				<0.01-0.08	<0.01-0.1	
PCDD/F ⁵	ng I-TEQ/Nm ³	0.1		Periodic, short term	<0.01-0.04	<0.01-0.06	Periodic, short term
PCDD/F + PCB-DL ⁵	ng I & WHO-TEQ/Nm ³			Periodic, short term	<0.01-0.06	<0.01-0.08	
Cd+Tl	mg/Nm ³	0.05		Periodic, short term	0.005 - 0.02		Periodic, short term
Sb+As+Pb+Cr+Co+Cu+Mn+Ni+V	mg/Nm ³	0.5		Periodic, short term	0.01-0.3		Periodic, short term

(⁵): Either the BATAELs for PCDD/F or the BATAELs for PCDD/F + PCBs-DL apply. PCB-DL monitoring does not apply if PCB-DL are proven to be less than 0.01 ng WHO-TEQ/Nm³.
 (⁶): The long term sampling BATAELs do not apply if the emission levels are proven to be sufficiently stable.



WI BREF additional air monitoring requirements

- No BATAELs on these substances

N₂O	- If fluidised bed furnace - or if SNCR de-NO _x operated with urea	Once every year
PBDD/F	- If incineration of waste containing brominated flame retardants - or in plants using BAT-c 31.d for Hg reduction with continuous injection of bromine	Once every six months
Benzo[<i>a</i>]pyrene		Once every year



Draft WI BATAELs for emissions to water and monitoring requirements

BATAELs for emissions to water from waste water from FGC and from bottom ash treatment:

Depending on the type of waste water treatment:

- **Direct emissions** to a receiving water body
 - From Bottom ash treatment and flue gas cleaning system
 - TSS (daily), TOC, metals, ammonium-nitrogen, sulphate and PCDD/F (every month)
 - Some values lower than the BATAELs in Waste Treatment BREF
- **Indirect emissions** (to a subsequent waste water treatment plant)
 - Metals and PCDD/F
 - May not apply “if the downstream waste water treatment plant is designed and equipped to abate the pollutants concerned, provided this does not lead to a higher level of pollution in the environment.”

Water emissions – BATAELs

 In green if also applies to indirect emissions

Monitoring is in BAT-c 6

Parameter		Process	Unit	BAT-AEL (1)	IED Annex VI	
Total suspended solids (TSS)		FGC	mg/l	10–30	30 (95%) - 45	Once every day
		BA treatment				
Total organic carbon (TOC)		FGC		15–40	x	
		BA treatment				
Metals and metalloids	As	FGC		0.01–0.05	0,15	
	Cd	FGC		0.005–0.03	0,05	
	Cr	FGC		0.01–0.1	0,5	
	Cu	FGC		0.03–0.15	0,5	
	Hg	FGC		0.001–0.01	0,03	
	Ni	FGC		0.03–0.15	0,5	
	Pb	FGC		0.02–0.06	0,2	
				BA treatment		
	Sb	FGC		0.02–0.9	x	
TI	FGC	0.005–0.03		0,05		
Zn	FGC	0.01–0.5		1,5		
Ammonium-nitrogen (NH ₄ -N)		BA treatment	10–30	x	Once every month	
Sulphate (SO ₄ ²⁻)		BA treatment	400–1 000	x		
PCDD/F		FGC	ng I-TEQ/l	0.01–0.05		0,3

Footnote on indirect emissions: These BATAELs may not apply to indirect emissions (external WWTP releases) if the wastewater treatment plant downstream of the site is designed and equipped to reduce these pollutants, provided that this does not result in higher level of pollution in the environment.



Draft WI BAT Conclusions - Main new requirements

- **Radioactivity detection** for MSW & Non-haz. SW but “...depending on the risk posed by the incoming waste...” (BAT11)
- Non-hazardous waste incineration plants **without energy recovery** are not BAT (BAT 19). 2 sets of BATAEELs for non-haz. waste (BAT 20).
 - However, boiler efficiency not requested for hazardous waste incinerators
- **Flue Gas Cleaning residues must be separated** from bottom ash (BAT 35):
“In order to increase resource efficiency, BAT is to handle and treat bottom ashes separately from FGC residues”
 - WI BREF Chapter 7 recommends to collect information on the possible consequences of mixing bottom ashes and boiler ashes on the hazardousness of the resulting material
- BATs on Diffuse emissions & odours (BAT 22), but no BATAELs except for bottom ash treatment (BAT 23 ter and BAT 27): *“Enclose/encapsulate potentially dusty operations (such as grinding, screening) and/or cover conveyors and elevators...” “Operate under sub-atmospheric pressure”.*



Main issues left UNSAID in Draft WI BAT conclusions

- How to use the BATAEL **ranges** to set ELVs
 - Only 3 footnotes state that the lower end of a particular BATAEL range can be achieved when using a particular technique
- BATAELs refer to NOC and therefore ELVs set in permits from BATAELs apply in NOC:
 - IED Article 15.3 : *“The competent authority shall set emission limit values that ensure that, **under normal operating conditions**, emissions do not exceed the emission levels associated with the best available techniques “*
- **Definition** of NOC and **OTNOC** situations
- How to take into account **measurement uncertainty** when using BATAELs to set ELVs: only one phrase in Chapter 7, Concluding remarks and recommendations for future work:
*“For emissions to air of dust, HCl, HF, CO, TVOC, SO₂, metals and metalloids including mercury, NH₃, as well as PCDD/F and dioxin-like PCBs, the TWG highlighted the potential difficulty, at the time when the Waste Incineration BREF was under review, of assessing compliance with emission limit values when these are set around the lower end of the BAT-AEL ranges, **due to the likely increase of the relative measurement uncertainty (i.e. the uncertainty expressed as a percentage of the measured value) with decreasing emission levels.**”*



Main issues left UNSAID in WI BREF BAT conclusions

- How to deal with BATAEPLs (other than BATAELs): they are not mentioned in the requirements of the IED (as it is instead for BATAELs).
- Definition of “depending on the **risk posed by the incoming waste**” for e.g. the radioactivity detection
- Definition of “**low and stable**” and “**sufficiently stable**” emissions in the footnotes for mercury, PCDD/F (+ PCB-dl), HCl and some water emissions’ BATAELs.
- **Difference** between **former BATAELs** (under IPPC) and new BATAELs (IED)
- How to **calculate** valid **daily averages in NOC** from measured values
- How to address the **indicative half-hourly** values for mercury
- What is the definition of “**generally applicable**” (different from “*always applicable*”, according to the EIPPCB).
- How to **assess compliance** with BATs and BATAELs



Thank you!

Questions?