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KICK-OFF MEETING
FOR THE REVIEW OF THE
BEST AVAILABLE TECHNIQUES (BAT)
REFERENCE DOCUMENT FOR THE
SURFACE TREATMENT OF METALS AND PLASTICS
(STM BREF)

Web-based meeting, 30 May – 7 June 2022

MEETING REPORT

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ACRONYMS

General acronyms – Definitions

Acronym	Meaning
BAT	Best Available Techniques (as defined in Article 3(10) of the IED)
BAT-AEL	Emission level associated with the BAT (as defined in Article 3(13) of the IED)
BAT-AEPL	BAT-associated environmental performance level (as described in Section 3.3 of Commission Implementing Decision 2012/119/EU). BAT-AEPLs include BAT-AELs
BATIS	BAT Information System
BG	Batch galvanising
BP	Background Paper
BREF	BAT reference document (as defined in Article 3(11) of the IED)
CBI	Confidential Business Information
COM	The European Commission
CVD	Chemical Vapour Deposition
ECHA	European Chemicals Agency
EFS BREF	BAT reference document on Emissions From Storage
EIPPCB	European IPPC Bureau
EN	European Standard adopted by CEN (European Committee for Standardisation, from its French name Comité Européen de Normalisation)
ENE BREF	BAT reference document for Energy Efficiency
ETS	Emissions Trading System
EU	European Union
FMP BREF	BAT reference document for the Ferrous Metals Processing industry
HDC	Hot dip coating
HR	Hot rolling
ICS BREF	BAT reference document on Industrial Cooling Systems
IED	Industrial Emissions Directive (2010/75/EU)
IPPC	Integrated Pollution Prevention and Control
KEI	Key environmental issue
KoM	Kick-off Meeting
LCP BREF	BAT reference document for Large Combustion Plants
MCPD	Medium Combustion Plants Directive
MS	Member State (of the European Union)
NGO	Non-governmental organisation
OTNOC	Other than normal operating conditions
PCB	Printed Circuit Boards (manufacturing)
REACH	Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals
STM BREF	BAT reference document for the Surface Treatment of Metals and Plastics
STM sector	The Surface Treatment of Metals and Plastics sector
STS BREF	BAT reference document on Surface Treatment Using Organic Solvents including Wood and Wood Products Preservation with Chemicals
TWG	Technical Working Group

Substances, groups of substances and parameters

Acronym	Meaning
Ag	Silver
Al	Aluminium
B	Boron
Ba	Barium
AOX	Adsorbable organically bound halogens
As	Arsenic
BOD _n	Biochemical oxygen demand after n days
BPA	Bisphenol A
Cd	Cadmium
CMR	Carcinogenic, mutagenic or toxic for reproduction (substance)
CMR 1A	CMR substance of category 1A as defined in Regulation (EC) No 1272/2008 as amended
CMR 1B	CMR substance of category 1B as defined in Regulation (EC) No 1272/2008 as amended
CMR 2	CMR substance of category 2 as defined in Regulation (EC) No 1272/2008 as amended
Co	Cobalt
CO	Carbon monoxide
CO ₂	Carbon dioxide
COD	Chemical oxygen demand
Cr	Chromium
Cr(VI)	Hexavalent chromium
Cd	Cadmium
Cl	Chloride
Cu	Copper
CN	Cyanides
DCM	Dichloromethane
EDTA	Ethylenediaminetetraacetic acid
Fe	Iron
H ₂ SO ₄	Sulphuric acid
H ₃ PO ₄	Phosphoric acid
H ⁺	Hydrogen nucleus
HC(s)	Hydrocarbon(s)
HCFCs	Hydrochlorofluorocarbons
HCl	Hydrochloric acid
HCN	Hydrogen cyanide
HF	Hydrogen fluoride
HFCs	Hydrofluorocarbons
Hg	Mercury
HNO ₃	Nitric acid
HOI	Hydrocarbon oil index. The sum of compounds extractable with a hydrocarbon solvent (including long-chain or branched aliphatic, alicyclic, aromatic or alkyl-substituted aromatic hydrocarbons)
GHG(s)	Greenhouse gas(es)
Mg	Magnesium
Mn	Manganese
Mo	Molybdenum
NaOH	Sodium hydroxide
NH ₃	Ammonia
Ni	Nickel
NO _x	Nitrogen oxides
NP/NPEs	Nonylphenol and Nonylphenol ethoxylates
OH ⁻	Hydroxide
OP/OPEOs	Octylphenol and Octylphenol ethoxylates
PAHs	Polycyclic aromatic hydrocarbons
Pb	Lead
PER	Tetrachloroethylene
PFBS	Tetraethylammonium perfluorobutanesulphonate
PFAS	Per- and poly-fluoroalkyl substances
PFOS	Perfluorooctane sulphonate

POPs	Persistent organic pollutants
Sb	Antimony
Se	Selenium
Sn	Tin
SO _x	Sulphur oxides
SVHC(s)	Substance(s) of very high concern
Ti	Titanium
TOC	Total organic carbon
Total N	Total nitrogen
TSS	Total suspended solids
TVOC	Total volatile organic compounds
VOC(s)	Volatile organic compound(s) (as defined in Article 3(45) of the IED)
Zn	Zinc
6:2 FTS	6:2 Fluorotelomer sulphonate

Participants in the Kick-off Meeting

Acronym	Participant	Number of participants in the Kick-off Meeting
Member States		
AT	Austria	1
BE	Belgium	3
BG	Bulgaria	1
CY	Cyprus	1
CZ	Czechia	2
DE	Germany	3
DK	Denmark	2
EL	Greece	2
ES	Spain	6
FI	Finland	3
FR	France	4
HU	Hungary	10
IT	Italy	5
NL	Netherlands	2
PL	Poland	7
PT	Portugal	2
SE	Sweden	3
SK	Slovakia	1
Other countries		
NO	Norway	1
Environmental non-governmental organisations		
EEB	European Environmental Bureau	3
Industry associations		
ACEA	European Automobile Manufacturers' Association	2
BUSINESSEUROPE	Confederation of European Business	1
CEFIC	European Chemical Industry Council	2
CETS	European Committee for Surface Treatments	3
ECCA	European Coil Coating Association	3
ESTAL	European Association for Surface Treatment of Aluminium	2
EUROFER	The European Steel Association	9
European Commission		
DG ENV	Directorate-General for Environment	4
JRC - EIPPCB	Joint Research Centre - European IPPC Bureau	10
European Agency		
ECHA*	European Chemicals Agency	1
Total		99

* participated as an observer

1 INTRODUCTION

1.1 Kick-off Meeting for the review of the STM BREF

The Technical Working Group (TWG) for the review of the Best Available Techniques Reference Document for the Surface Treatment of Metals and Plastics ([STM BREF](#), August 2006) held its Kick-off Meeting (KoM) as a series of four web-based sessions in the period from 30 May to 7 June 2022.

TWGs are set up to facilitate the exchange of information under Article 13(1) of the [Industrial Emissions Directive \(2010/75/EU\)](#).

The review of the STM BREF started in June 2021 with the reactivation of the TWG by the EIPPCB. Subsequently, the EIPPCB sent out a call for initial positions on 17 November 2021, with a deadline for responses of 21 January 2022. A total of 21 stakeholder groups responded: 14 Member States (AT, BE, CZ, DE, DK, ES, FI, FR, IT, NL, PL, PT, SE and SK) plus NO, 5 industry associations (CEFIC, CETS, EGGA, ESTAL and EUROFER) and 1 environmental NGO (EEB). Based on these responses, a Background Paper (BP) was prepared by the EIPPCB to facilitate the discussion at the Kick-off Meeting. The BP lists the proposals of the EIPPCB made in the call for initial positions, summarises and assesses the initial positions of TWG members on those proposals, and presents the modified EIPPCB proposals. Following the assessment of initial positions, the BP identified items for discussion (BP Section 2) and not for discussion at the KoM (BP Section 3).

The EIPPCB uploaded the BP to BATIS on 20 April 2022 and organised the KoM as a series of four web-based sessions between 30 May and 7 June 2022 (see Table 1).

The KoM started on Monday 30 May 2022 in the morning and finished on Tuesday 7 June 2022 in the afternoon. The agenda included presentations and discussions on, for example, scope, key environmental issues for emissions to air and to water as well as for consumption of energy, water, and materials and other items relevant for the review of the STM BREF. In response to the reactions and comments on the BP received by 15 May 2022, it was decided to also discuss several items at the KoM that were originally proposed as not for discussion in the BP (see Table 1).

The Head of the EIPPCB and a permanent staff member of the EIPPCB chaired the KoM. The STM BREF co-authors (i.e. the STM BREF author team of the EIPPCB) introduced each topic and led the technical discussions. The TWG's agreement was sought on the following key items: 1) scope of the revised STM BREF, 2) interface with other BREFs, 3) structure of the revised STM BREF, 4) key environmental issues, and 5) data collection and next steps for the review of the STM BREF.

All items were discussed in a similar manner. First, the EIPPCB presented the original proposal or request for information as included in the call for initial positions. This was followed by an overview of the initial positions of TWG members and the subsequent assessment by the EIPPCB. Afterwards, the modified EIPPCB proposal was presented. TWG members then had the opportunity to express their positions, respond to the interventions of others, and reach a consensus, which often led to a conclusion improving the original EIPPCB proposal.

Table 1: Agenda of the STM TWG KoM

Item	BP Section #
Session 1: 30 May 2022	
Welcome, Meeting rules, Tour de table	-
Introductory presentation by DG ENV	-
Introductory presentation by the EIPPCB – The Sevilla process	-
Introductory presentation the EIPPCB – Overview of the work carried out so far on the STM BREF review, Structure of the meeting	-
Scope	2.1.1, 2.1.2, 2.1.3, 3.1.1, 3.1.3, 3.1.4, 3.1.5
KEIs air and water – presentation of the approach	2.2.2
KEIs air (TVOC, PER, Cr(VI), NH ₃)	2.2.3.1.1-2, 2.2.3.2.1-2
Session 2: 1 June 2022	
KEIs air (sulphuric acid, alkalinity, total acidity, phosphoric acid, tin, silver and HCl).	2.2.3.2.3-8
KEIs water (formaldehyde, PFOS, PFAS, EDTA, other poorly biodegradable complexants, trichloromethane, OP/OPEOs, NP/NPEOs, surfactants, acute toxicity, additional metals, sulphides and organosulphides)	2.2.4.1.1-6, 2.2.4.2.1-6
Session 3: 3 June 2022	
Specific energy consumption, specific consumption of water and amount of water discharged, selection of chemicals and substitution, specific consumption of raw materials and chemicals, decarbonisation, industrial symbiosis, waste generated.	2.2.5, 2.2.8, 2.2.7, 2.2.9, 2.2.6, 2.2.10, 2.2.11
Data collection: expression of BAT-AELs for emissions to air/ water, averaging periods for BAT-AELs for emissions to air and to water, units for collecting data, confidentiality issues	2.3.1.1, 2.3.1.2, 2.3.1.3, 2.3.2
Session 4: 7 June 2022	
Presentation of other proposals not for discussion: Scope (independently operated waste water treatment plants), structure, KEIs air (dust, odour, noise, BPA), KEI water (BPA), techniques (retention of fire-fighting water)	3.1.2, 3.2, 3.3.1.1.7, 3.3.1.1.10, 3.3.1.1.11, 3.3.1.2.5, 3.3.2.2.4
Introduction to BATIS	-
Next steps	2.4
Summary conclusions	-
Site visits	-
Closure of the meeting	-

NB: Each online session was preceded by a 15-minute connection period. BP Section 2 comprises items proposed for discussion and BP Section 3 comprises items not proposed for discussion at the KoM.

This document summarises the discussion at the KoM and presents all conclusions reached by the TWG. It does not list or repeat all interventions but instead provides a synthetic overview of the arguments put forward by TWG members in order to conclude on the proposals.

The following sections (2-8) first present the EIPPCB proposal, then a summary of the discussion, and finally the conclusions reached by the TWG. For transparency, all conclusions that were formally adopted by the TWG are shown in grey boxes. For brevity, the presentation of the EIPPCB proposal is omitted where it is similar to the final conclusions (as is generally the case for items not proposed for discussion in Section 3 of the BP).

All presentations given and conclusions reached at the KoM are available to TWG members and observers in BATIS.

As of 10 June 2022, the TWG consists of 172 members representing EU Member States and Norway, industry associations, an environmental NGO, and the European Commission and 2 observers from ECHA. Of these, 99 TWG members (59 from Member States plus Norway, 22 from industry, 3 from an environmental NGO and 14 from the European Commission) as well as the 1 observer from ECHA attended the KoM.

1.2 Introductory presentations

The Head of the EIPPCB opened the KoM and welcomed TWG members and observers. Following a short presentation on meeting rules and a ‘tour de table’, a representative of the Directorate-General for Environment of the European Commission (DG ENV) gave a presentation: 1) recalling the overall context and legal framework under which the STM BREF review will take place, 2) emphasising new policy priorities towards decarbonisation, zero-pollution and circular economy under the European Green Deal and 3) informing the TWG of the Commission’s proposal for the revision of the IED.

The EIPPCB gave a general introduction to the *Sevilla process* for drawing up and reviewing BREFs. The presentation highlighted the approach to derive BAT and BAT-associated environmental performance levels (BAT-AEPLs), which is a pragmatic and iterative process involving the whole TWG. In this process, the EIPPCB’s responsibility is to make concrete proposals on BAT and BAT-AEPLs to the whole TWG based on the information collected, especially based on the plant-specific data collected through questionnaires. The TWG is invited to comment on these proposals and to submit any evidence supporting alternative proposals. Decisions on BAT (including on BAT-AE(P)Ls) are taken by consensus by the whole TWG at the Final Meeting.

The work of the STM TWG will follow the BREF Guidance for the exchange of information under the IED as stated in [Commission Implementing Decision 2012/119/EU](#).

2 SCOPE OF THE STM BREF

2.1 Activities covered

In BP Section 2.1.1, the EIPPCB proposed the following:

- To include in the scope of the STM BREF the activities listed in point 2.6 of Annex I to the IED.

One MS proposed to include in the STM BREF a clarification of the definition of the term ‘treatment vat’ based on the [‘summary of answers given to implementation questions’](#) issued by DG ENV. This proposal was also supported by another MS.

One MS asked for clarification on which pre- and post-treatment activities are covered by the scope. An industry association asked for clarification on whether spray processes are included in the scope and if the volume of the spraying material is included in the 30 m³ threshold in point 2.6 of Annex I to the IED.

The EIPPCB reminded the TWG that legal discussions on the interpretation of the IED are not within the remit of the TWG and proposed to consider adding in the descriptive part of the BREF a link to the ‘summary of answers given to implementation questions’ issued by DG ENV. It was also explained that all directly associated activities which may have an impact on consumption and emissions are covered under the scope.

Conclusions reached by the TWG:

- To include in the scope of the STM BREF the activities listed in point 2.6 of Annex I to the IED.
- To consider adding in the descriptive part of the BREF a link to the ‘summary of answers given to implementation questions’ published on the website of DG ENV in relation to how the term ‘treatment vat’ should be understood.

Note: The TWG to decide at a later stage, based on the information and data collected, which associated processes will be reflected in the BAT conclusions.

2.1.1 Semiconductor manufacturing

In BP Section 2.1.3.1, the EIPPCB proposed the following:

- To include semiconductor manufacturing in the scope of the STM BREF.

One MS noted that semiconductor manufacturing is not comparable to printed circuit board (PCB) manufacturing, that the 30 m³ threshold in the volume of treatment vats in point 2.6 of Annex I to the IED may not be exceeded and that representatives of the relevant industry association were not present in the discussion. Two other MS noted that there are semiconductor manufacturing plants in their countries but all of them are below the 30 m³ threshold. An environmental NGO proposed to collect data from plants outside the EU and not only from plants in the EU.

The EIPPCB explained that the number of semiconductor manufacturing plants in the EU is expected to increase dramatically in the short term as a result of the European Chips Act and that therefore it is worth covering this activity under the STM BREF even though the threshold of 30 m³ may not be the most appropriate for the semiconductor manufacturing activity. Otherwise, the semiconductor manufacturing activity would be left uncovered for a long period of time since it was not covered under the [STS BREF](#), the review of which was recently finalised. The EIPPCB also noted that several attempts were made to establish contact with the relevant industry associations before the KoM without success.

During the discussion it became clear that the KEI for the semiconductor manufacturing activity could not yet be derived as representatives of the relevant industry association were not present.

The EIPPCB will continue to reach out to the relevant industry associations as it is important to have the semiconductor industry on board for the next steps of the STM BREF review¹. At the end of the discussion the consensus reached was as follows.

Conclusions reached by the TWG:

- To include semiconductor manufacturing in the scope of the STM BREF.

Note: A large majority of the semiconductor manufacturing plants in the EU are expected to be below the threshold in point 2.6 of Annex I to the IED. A meaningful data collection will only be possible if some of these plants take part in the information exchange.

Given that the main industry associations covering semiconductor manufacturing were not present in the KoM, it will be necessary to seek their participation in the STM BREF review process.

¹ In line with the conclusion taken during the KoM, the EIPPCB organised a meeting with representatives of the European Semiconductor Industry Association (ESIA) on 12 July 2022 to introduce the STM BREF review and the conclusion taken to include semiconductor manufacturing in the scope of the STM BREF.

2.2 Surface treatment of metals and plastic process steps

In BP Section 3.1.1, the EIPPCB proposed the following:

- To cover in the STM BREF the following processes/process steps:
 - Delivery and storage – workpieces and consumable raw materials;
 - Handling techniques for loading and processing;
 - Pretreatment of workpiece or substrate;
 - Drag-out and rinsing;
 - Core activities:
 - Copper and copper alloy plating;
 - Nickel electroplating;
 - Chromium plating;
 - Zinc and zinc alloy plating;
 - Cadmium plating;
 - Tin and alloy plating;
 - Precious metal plating;
 - Autocatalytic plating (catalytic chemically reduced coatings);
 - Immersion or displacement coatings – non-catalytic chemically reduced coatings;
 - Electropainting or electrocoating;
 - Lacquering;
 - Oiling;
 - Anodising;
 - Colour anodising on aluminium;
 - Sealing following anodising;
 - Phosphating layer conversion coatings;
 - Chromium conversion coatings;
 - Metal colouring;
 - Bright dipping;
 - Chemical blacking – oxide coatings;
 - Brightening;
 - Etching – Alkaline etching of aluminium;
 - Chemical milling;
 - Post-treatment activities (drying and heat treatment);
 - Water and waste water treatment, process solution maintenance;
 - Barrel processing;
 - Continuous coil – large-scale steel surface treatment;
 - Sheet processing for aluminium lithography plates;
 - Printed circuit board manufacturing.

- To further define which processes/process steps are included in the three groups (pretreatment, core activities, post-treatment) in the structure of the revised BREF at a later stage, based on the information collected.

The proposal was not foreseen for discussion at the KoM; TWG members did not request to discuss it before or during the KoM and thus the EIPPCB proposal was adopted without change.

Conclusions reached by the TWG:

- To confirm, in principle, the original EIPPCB proposal on the processes/process steps covered in the STM BREF.
- To further define which processes/process steps are included in the three groups (pretreatment, core activities, post-treatment) in the structure of the revised BREF at a later stage, based on the information collected.

2.3 Interface with other BREFs

2.3.1 Interface with the STS BREF

In BP Section 2.1.2.1, the EIPPCB proposed the following:

- To avoid duplication of information with the STS BREF and make appropriate cross-reference(s) to it.

One MS asked for clarification on whether an e-coating process not for vehicle bodies is covered under the STM BREF.

Another MS asked for clarification on three potential cases:

- a) pretreatment lines with vats above 30 m³ that are considered under the STM BREF;
- b) pretreatment lines with vats above 30 m³ combined with STS processes that are considered under the scope of the STS BREF;
- c) pretreatment lines with vats above 30 m³ and solvent-based processes below the threshold in point 6.7 of Annex I to the IED that are considered under the STM BREF.

The same MS also noted that emissions to air from pickling occur in both STM and STS processes. Two MS stated that pickling is not covered under the STS BREF and one of these MS asked how to handle the situation where a pickling process takes place and solvent consumption capacity is above the threshold in point 6.7 of Annex I to the IED.

Another MS asked for clarification on whether a pretreatment step described in the STS BREF will be covered (or not) in the STM BREF.

The EIPPCB explained that it may be the case that water-based processes are carried out at installations permitted either as STM or STS activities. In STS activities, VOC emissions are the main environmental concern but emissions from other surface (pre/post-)treatment processes may also occur. Neither the STS nor the STM BREF can address any individual case. This is an implementation issue for which the role and the responsibility of the competent authority is important. While STS activities are excluded from the STM BREF scope, the STM BAT conclusions can also be a relevant source of information in the permitting process of STS installations as these BAT conclusions will focus on aspects not addressed in the STS BREF.

Conclusions reached by the TWG:

- To avoid duplication of information included in the STS BREF and make appropriate cross-reference(s) to it.
- To exclude surface treatment processes which are carried out as part of activities subject to point 6.7 of Annex I to the IED (STS activities), e.g. vehicle body electropainting or chemical pretreatment in coil coating.

Note: To reflect in the KoM report the discussions that took place during the KoM.

2.3.2 Interface with the FMP BREF

In BP Section 2.1.2.2, the EIPPCB proposed the following:

- To exclude from the STM BREF the surface treatment of ferrous metals using electrolytic or chemical processes where the volume of the treatment vats exceeds 30 m³, when it is carried out in cold rolling, wire drawing or batch galvanising.

An industry association noted that there are common processes in FMP and STM installations (e.g. decoiling, welding, cleaning). It was also noted that electrolytic processes are not covered in the FMP BREF.

One MS stated that a reference to hot rolling (HR) and hot dip coating (HDC) galvanising processes is missing from the proposal and should be added (which was supported by a number of other MS) and proposed to rephrase the paragraph on the exclusions from the STM scope with reference to what is included in the FMP scope.

Another MS asked to align the wording in the STM scope with that of the FMP scope.

An environmental NGO asked to add a note with a clarification of what is excluded from the STM scope to avoid repetition by cross-referencing the FMP BREF, similar to that agreed for the interface with the STS BREF.

A MS asked to make it clear in the STM scope that batch galvanising (BG) activities are covered under the FMP scope.

The EIPPCB explained that surface treatment activities are excluded from the STM scope when they are covered by the FMP scope. The definitions used in the FMP BAT conclusions for the FMP activities (e.g. HR, HDC, BG) clearly refer to the core activity as well as to any pre- and post-treatment directly associated with this core activity.

Conclusions reached by the TWG:

- To avoid duplication of information included in the FMP BREF and make appropriate cross-reference(s) to it.
- To exclude from the STM BREF the surface treatment of ferrous metals using electrolytic or chemical processes where the volume of the treatment vats exceeds 30 m³ when it is covered under the scope of the FMP BAT conclusions.

Note: To align the relevant definitions of the FMP processes, given in the FMP BAT conclusions, in the STM BREF.

2.3.3 Interface with the CER BREF

In BP Section 3.1.4.2, the EIPPCB proposed the following:

- To include porcelain/vitreous enamelling of metals in the scope of the STM BREF.

The proposal was not foreseen for discussion at the KoM. However, one MS and one industrial organisation requested to discuss it and it was thus decided to discuss it at the KoM.

One MS stated that there are some plants in Europe but the process is very specific and not similar to the main STM processes. This opinion was supported by another MS. Another MS stated that there is one metal enamelling plant in its territory with pretreatment vats with a volume greater than 30 m³ and that Ni emissions to water are the main environmental issue. One industry organisation supported including enamelling of metals under the scope of the CER BREF.

The EIPPCB explained that the activity proposed for inclusion in the scope of the STM BREF refers to enamelling of metals and not of ceramic products and that water-based pretreatment processes in this activity are similar to those of other STM activities.

Following the discussion, the TWG agreed to keep the proposal unchanged.

Conclusions reached by the TWG:

- To include porcelain/vitreous enamelling of metals in the scope of the STM BREF.

2.3.4 Interface with the LCP BREF and MCP Directive

In BP Section 3.1.4.1, the EIPPCB proposed the following:

- To include in the scope of the STM BREF only those on-site combustion processes that:
 - generate hot gases for direct contact heating, drying or any other treatment of objects or materials; or
 - whose radiant and/or conductive heat is transferred to objects or feed material through a solid wall without using an intermediary heat transfer fluid.

The proposal was not foreseen for discussion at the KoM. One industrial organisation requested to discuss it and it was thus decided to discuss it at the KoM. However, no TWG comments were made and therefore the TWG agreed to keep the proposal unchanged.

Conclusions reached by the TWG:

- To include in the scope of the STM BREF only those on-site combustion processes that:
 - generate hot gases for direct contact heating, drying or any other treatment of objects or materials; or
 - whose radiant and/or conductive heat is transferred to objects or feed material through a solid wall without using an intermediary heat transfer fluid.

2.4 Independently operated WWTPs

In BP Section 3.1.2, the EIPPCB proposed the following:

- To include in the scope of the STM BREF the activity listed in point 6.11 of Annex I to the IED (i.e. independently operated treatment of waste water not covered by Directive 91/271/EEC) when the main pollutant load originates from the activities within the scope of the STM BREF.

The proposal was not foreseen for discussion at the KoM. However, one industry association provided comments on this proposal and it was thus decided to discuss it at the KoM. No more comments were presented during the discussion and the TWG agreed to keep the proposal unchanged.

Conclusions reached by the TWG:

- To include in the scope of the STM BREF the activity listed in point 6.11 of Annex I to the IED (i.e. independently operated treatment of waste water not covered by Directive 91/271/EEC) when the main pollutant load originates from the activities within the scope of the STM BREF.

2.5 Combined treatment of waste water

In BP Section 3.1.3, the EIPPCB proposed the following:

- To include in the scope of the STM BREF the combined treatment of waste water from different origins provided that the main pollutant load originates from the activities within the scope of the STM BREF and that the waste water treatment is not covered by Directive 91/271/EEC.

The proposal was not foreseen for discussion at the KoM. However, one MS and one industry association provided comments on this proposal and it was thus decided to discuss it at the KoM.

During the discussion, one MS stated that the wording could be modified in order to ensure that all pollutants are treated to the maximum possible extent while avoiding simple dilution. This opinion was supported by various MS and one environmental NGO. Another MS stated that, while agreeing with the logic behind the proposal, the discussion at the KoM is about the scope and not on how the relevant BAT will be formulated.

Following the discussion, the TWG agreed to keep the proposal unchanged.

Conclusions reached by the TWG:

- To include in the scope of the STM BREF the combined treatment of waste water from different origins provided that the main pollutant load originates from the activities within the scope of the STM BREF and that the waste water treatment is not covered by Directive 91/271/EEC.

2.6 Additional proposal – chemical vapour deposition (CVD)

In BP Section 3.1.5.1, the EIPPCB proposed the following:

- To include chemical vapour deposition when it occurs as a process step of or as an activity directly associated with the STM activity.

TWG members did not request to discuss it before or during the KoM and thus the EIPPCB proposal was adopted without change.

Conclusions reached by the TWG:

- To include chemical vapour deposition when it occurs as a process step of or as an activity directly associated with the STM activity.

3 STRUCTURE OF THE STM BREF AND ITS BAT CONCLUSIONS

In BP Section 3.2.1, the EIPPCB proposed the following:

- To follow and, where needed, adapt the structure of the 2006 STM BREF during the review.

The proposal was not foreseen for discussion at the KoM but before the KoM one TWG member requested to discuss it, in relation to the scope and process steps of the STM BREF. The topic was briefly discussed with the aim of clarifying the distinction between core and stand-alone activities/other directly associated activities (pre- and post-treatment activities) to be considered and described. The EIPPCB proposal was adopted without change.

Conclusions reached by the TWG:

- To generally use the structure of the 2006 STM BREF, which might be subject to possible adaptations depending on the information and data collected during the STM BREF review. This may also include an alignment of the wording according to activities in point 2.6 of Annex I to the IED.

3.1 Applied processes and techniques in the current BREF

In BP Section 3.2.2, the EIPPCB proposed the following:

- To update the process descriptions and techniques in the 2006 STM BREF with information provided by the TWG.
- The TWG to provide written contributions on the processes and techniques in order to be considered in the STM BREF review.

The proposal was not foreseen for discussion at the KoM; TWG members did not request to discuss it before or during the KoM and thus the EIPPCB proposal was adopted.

Conclusions reached by the TWG:

- To update the process descriptions listed in Chapter 2 of the BREF with the information provided by the TWG, in particular on the topics most commented on.
- The TWG to provide written contributions on the processes and techniques referred to above in order to be considered in the STM BREF review.

4 EMISSIONS TO AIR AND TO WATER

4.1 Overview

A large part of the KoM was dedicated to discussing and agreeing upon the key environmental issues (KEIs) to be addressed in the review of the STM BREF and the related substances/groups of substances/parameters to be included in the data collection through plant-specific questionnaires. It was also discussed in detail whether data on pollutants emitted to air and to water should be collected with the aim to derive BAT-associated emission levels (BAT-AELs) or with the aim to provide the TWG with evidence to decide at a later stage, based on the data collected, whether BAT-AELs should be derived. This section addresses emissions to air and to water. Parameters related to the consumption of energy, water, raw materials and chemicals as well as to waste water discharge and waste/by-products generation are addressed in Section 5.

Unless specified otherwise, for substances/groups of substances/parameters that are not proposed as KEIs, no data will be collected via questionnaires and no BAT-AELs will be set. However, ‘bulk information’ on associated techniques can be collected by the TWG and may be considered for the review of the STM BREF (see Section 8).

In total, more than 70 substances/groups of substances/parameters, which might potentially be relevant when considering emissions to air and to water from STM installations, were included as candidate KEIs in the BP. These substances/groups of substances/parameters were assessed by the EIPPCB based on the initial positions provided by TWG members and on available scientific and technical information.

The EIPPCB assessment was based on the following four criteria:

1. the environmental relevance of a substance/group of substances/parameters;
2. the significance of an activity, i.e. its contribution to the overall (industrial) emissions in the EU;
3. the potential of the BREF review for identifying new or additional techniques that would further significantly reduce pollution;
4. the potential of the BREF review to set BAT-AELs that would significantly decrease current emission levels.

This approach was detailed in the BP and in the EIPPCB presentation made at the KoM.

This document does not aim to report the detailed discussions at the KoM for each and every substance/group of substances/parameters. Instead, it focuses on the most important points. The list of KEIs included in the review of the STM BREF is summarised in Table 2 and Table 4 (Sections 4.2 and 4.3). The TWG did not discuss in detail proposals from BP Section 3 intended ‘not for discussion’ at the KoM unless it was requested in the feedback received from the TWG ahead of the KoM.

4.2 Emissions to air

Based on the proposals made by the EIPPCB in the BP and on the discussions that took place during the KoM for each substance/group of substances/parameters, the TWG concluded that the KEIs and parameters presented in Table 2 below should be included in the STM BREF review.

During the KoM, the TWG discussed the modification of several initial proposals regarding, for example:

- removing the reference to certain process steps for substances included as KEIs;
- specifying that the TWG will decide at a later stage, based on the data collected for which sectors/processes BAT-AELs should be derived.

Especially for aerosols emissions, the discussion showed that there are two different approaches of dealing with acid emissions within the TWG: as individual parameters or as sum parameters. Information on both approaches will be collected (based on the data availability) and caution is needed when comparing the collected data. During the questionnaire development, emphasis will be given to the clarification of whether aerosols are included in the emission data to be reported in order to ensure comparability of collected data. In addition, the application of an extraction/abatement system for acid emissions was also discussed as well as the reasons for its application.

Table 2: KEIs for emissions to air included in the review of the STM BREF

Substance(s)	KoM conclusions
TVOC	To include TVOC as a KEI for processes generating VOC emissions, e.g. solvent-based degreasing, coating/painting, lacquering, thermal treatment, and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to air.
TVOC containing CMR 1 and CMR 2 substances	To further define additional parameter(s) for TVOC emissions during the questionnaire design.
Tetrachloroethylene	To include tetrachloroethylene as a KEI for degreasing and to collect data through plant-specific questionnaires on tetrachloroethylene emissions to air. The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs should be derived for tetrachloroethylene emissions to air.
Hydrogen cyanide	To include HCN as a KEI for processes associated with HCN emissions, e.g. activation, plating, degreasing, treatment, drying, and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to air.
Nitrogen oxides and carbon monoxide	To include NO _x as a KEI for processes associated with NO _x emissions, e.g.: <ul style="list-style-type: none"> • thermal processes using fuels; pickling, stripping, brightening, polishing when using HNO₃; with the aim to derive BAT-AELs for emissions to air. To collect data on carbon monoxide (CO) emissions from thermal processes using fossil fuels as contextual information. Note: Relevant contextual information (e.g. solution temperature, acid concentration in the bath, extraction and abatement techniques applied) will be collected during the information exchange through the questionnaires.

Substance(s)	KoM conclusions
Sulphur oxides	<p>To include SO_x as a KEI for processes associated with SO_x emissions, e.g. thermal processes using fuels, pickling and stripping when using sulphuric acid, and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to air.</p> <p>Note: Relevant contextual information (e.g. solution temperature, acid concentration in the bath, extraction and abatement techniques applied) will be collected during the information exchange through the questionnaires.</p>
Dust	<p>To include dust as a KEI for processes generating dust emissions, e.g. mechanical and/or thermal (pre)treatment, and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for dust emissions to air.</p>
Gaseous chlorides	<p>To include gaseous chlorides (expressed as HCl) as a KEI for processes associated with HCl emissions, e.g. pickling, stripping, acid degreasing, acid zinc plating, acid etching, rinsing, drying and thermal pretreatment, and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to air.</p> <p>Note: Relevant contextual information (e.g. solution temperature, acid concentration in the bath, extraction and abatement techniques applied) will be collected during the information exchange through the questionnaires.</p>
Gaseous fluorides	<p>To include gaseous fluorides (expressed as HF) as a KEI for processes associated with HF emissions, e.g. pickling and thermal pretreatment, and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to air.</p> <p>Note: Relevant contextual information (e.g. solution temperature, acid concentration in the bath, extraction and abatement techniques applied) will be collected during the information exchange through the questionnaires.</p>
Odour	<p>To include odour as a KEI and to collect information on techniques² to prevent and/or reduce odour emissions with the aim to derive BAT without associated environmental performance levels.</p>
Noise	<p>To include noise as a KEI and to collect information on techniques to prevent and/or reduce noise emissions with the aim to derive BAT without associated environmental performance levels.</p>
Zinc and its compounds	<p>To include zinc and its compounds (as Zn) as a KEI for processes associated with emissions of Zn and Zn compounds to air, e.g. plating, rinsing and drying, and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to air.</p>
Nickel and its compounds	<p>To include nickel and its compounds (as Ni) as a KEI for plating and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to air.</p>
Chromium and its compounds	<p>To include total chromium and its compounds (as Cr) as a KEI for processes associated with Cr emissions to air, e.g. plating and passivation, and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to air.</p>
Copper and its compounds	<p>To include copper and its compounds (as Cu) as a KEI for processes associated with Cu emissions to air, e.g. plating and passivation, and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to air.</p>
Cadmium and its compounds	<p>To include cadmium and its compounds (as Cd) as a KEI for plating and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to air.</p>

² During the discussion, it was mentioned that techniques applied to address diffuse emissions also have an impact on odour emissions. Diffuse emissions are addressed in BREFs when deemed relevant emissions.

Substance(s)	KoM conclusions
Lead and its compounds	<p>To include lead and its compounds (as Pb) as a KEI for plating and to collect data through plant-specific questionnaires on lead emissions to air.</p> <p>The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs should be derived for lead emissions to air.</p>
Hexavalent chromium	<p>To include hexavalent chromium as a KEI and to collect data through the plant-specific questionnaires on Cr(VI) emissions to air with the aim to derive BAT-AELs.</p> <p>To collect information on techniques aiming to substitute hexavalent chromium with less hazardous alternatives.</p>
Ammonia	<p>To include ammonia as a KEI and to collect data through plant-specific questionnaires on ammonia emissions to air.</p> <p>The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs should be derived for ammonia emissions to air.</p>
Sulphuric acid	<p>To include sulphuric acid as a KEI and to collect data through the plant-specific questionnaires.</p> <p>The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs for sulphuric acid emissions to air should be derived.</p> <p>Note: Relevant contextual information (e.g. solution temperature, acid concentration in the bath, extraction and abatement techniques applied) will be collected during the information exchange through the questionnaires.</p>
Alkalinity	<p>To include alkaline emissions (expressed as OH⁻) as a KEI and to collect data through the plant-specific questionnaires on alkaline emissions to air.</p> <p>The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs for alkaline emissions to air should be derived.</p> <p>Note: Relevant contextual information (e.g. solution temperature, alkaline concentration in the bath, extraction and abatement techniques applied) will be collected during the information exchange through the questionnaires for all alkaline treatment baths.</p>
Total acidity	<p>To include total acidic emissions (expressed as H⁺) as a KEI and to collect data through the plant-specific questionnaires on total acidic emissions to air.</p> <p>The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs for total acidic emissions to air should be derived.</p> <p>Note: Relevant contextual information (e.g. solution temperature, acid concentration in the bath, extraction and abatement techniques applied) will be collected during the information exchange through the questionnaires for all treatment baths containing acids.</p>
Hydrochloric acid	<p>To include HCl as a KEI and to collect data through the plant-specific questionnaires on HCl emissions to air with the aim to derive BAT-AELs for emissions to air.</p> <p>Note: Relevant contextual information (e.g. solution temperature, acid concentration in the bath, extraction and abatement techniques applied) will be collected during the information exchange through the questionnaires.</p>

Substance(s)	KoM conclusions
Greenhouse gases (GHGs)	To address the emissions of GHGs from STM activities in the context of decarbonisation.
Formaldehyde	To include formaldehyde as a KEI and to collect information and data on formaldehyde use and emissions in STM activities (e.g. autocatalytic copper plating, PCB manufacturing). The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs for formaldehyde emissions to air should be derived.

Table 3 lists the substances for which the conclusion reached during the meeting was to exclude them from the STM BREF review.

Table 3: KEIs for emissions to air excluded from the review of the STM BREF

Substance(s)	KoM conclusions
Per- and poly-fluoroalkyl substances (PFAS)	Not to include PFAS ³ as a KEI for emissions to air and not to collect data on PFAS emissions to air.
Opacity	Not to include opacity as a KEI and not to collect data on opacity.
Phosphoric acid	Not to include phosphoric acid as a KEI and not to collect data on phosphoric acid emissions to air.
Cobalt and its compounds	Not to include cobalt and its compounds as a KEI and not to collect data on emissions to air of cobalt and its compounds.
Tin and its compounds	Not to include tin and its compounds as a KEI and not to collect data on emissions to air of tin and its compounds.
Silver and its compounds	Not to include silver and its compounds as a KEI and not to collect data on emissions to air of silver and its compounds.
Bisphenol A (BPA)	Not to include 4,4'-isopropylidenediphenol (bisphenol A – BPA) as a KEI and not to collect data on its emissions to air.
Hydrochloro-fluorocarbons	To exclude HCFCs as a KEI and not to collect data on HCFCs emissions to air. To collect information on remaining quantities of HCFCs still present in STM installations.
Hydrofluorocarbons	To collect information on HFC uses in STM installations together with data on the quantities used and information on substitution with less harmful alternatives.
Dichloromethane	To collect information on DCM uses in STM installations together with data on the quantities used and information on substitution with less harmful alternatives.

³ In one MS, significant research is being carried out regarding PFAS emissions to air. If relevant information becomes available, this can be added in the descriptive part of the BREF.

4.3 Emissions to water

Following the proposals in BP Section 2.2.4 and the discussions during the KoM, the TWG decided to include in the STM BREF review the substances/groups of substances/parameters listed in Table 4.

In summary, the TWG discussed modifying several initial proposals:

- To consider PFOS as part of PFAS for collecting data on emissions to water.
- To collect detailed information on octylphenol and octylphenol ethoxylates, nonylphenol and nonylphenol ethoxylates or other types of surfactants used in the sector.
- To include Ba and Sb (and their compounds) emissions to water, and to collect data through the plant-specific questionnaires. The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs for emissions of these metals should be derived.
- To collect data on organosulphides additionally to sulphides emissions to water.
- To collect information on BPA emissions to water from PCB manufacturing and to include it in the descriptive part of the BREF.

Table 4: KEIs for emissions to water included in the review of the STM BREF

Substance(s) or parameters	KoM conclusions
Waste water sources	The TWG to consider all the available information for the drafting of the questionnaire. To collect information on direct and indirect waste water discharges through plant-specific questionnaires.
PFOS	To exclude PFOS as a KEI and not to collect data on PFOS emissions to water as an individual parameter, but to collect data on PFAS emissions to water. To collect information on potential leaching PFOS emissions resulting from historical PFOS use in chromium baths. This information will be added in the descriptive part of the BREF.
PFAS	To include PFAS as a KEI and to collect data on PFAS emissions to water through the plant-specific questionnaires. To collect information on the exact PFAS types used (e.g. 6:2 FTS), their quantities, their potential substitution with less harmful (e.g. fluorine-free) alternatives and the applied waste water treatment techniques (e.g. for short- or long-chain PFAS). The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs for PFAS emissions to water should be derived.
EDTA	To include EDTA as a KEI and to collect information and data on uses and emissions in the STM activities (e.g. acid gold plating, PCB manufacturing or degreasing baths). The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs for EDTA emissions to water should be derived.
Poorly biodegradable complexing agents (other than EDTA)	To include poorly biodegradable complexing agents other than EDTA as a KEI with the aim to collect information and data on types, usage quantities, relevant processes and substitution.

Substance(s) or parameters	KoM conclusions
Trichloromethane	To include trichloromethane as a KEI and to collect data through the plant-specific questionnaires on trichloromethane emissions to water with the aim to derive BAT-AELs for emissions to water.
(OP/OPEOs) – (NP/NPEOs)	<p>To include OP/OPEOs and NP/NPEOs as KEIs and to collect data on OP/OPEOs and NP/NPEOs emissions to water through the plant-specific questionnaires.</p> <p>To collect information on OP/OPEOs and NP/NPEOs uses, their quantities and potential substitution with less harmful alternatives.</p> <p>The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs for emissions of OP/OPEOs and NP/NPEOs should be derived.</p> <p>Note: To request in the questionnaire the type of OP/NP (e.g. branched and/or linear) the emission concentrations reported are associated with.</p> <p>To include in the descriptive part of the BREF information related to the status of these substances under the REACH Regulation.</p>
Surfactants (other than OP/OPEOs – NP/NPEOs)	To include surfactants other than OP/OPEOs and NP/NPEOs (e.g. anionic, cationic) as a KEI with the aim to collect information on the exact types of surfactants used, their quantities and potential substitution with less harmful alternatives.
Acute toxicity / whole effluent toxicity	<p>To include toxicity as a KEI.</p> <p>To collect data and contextual information on toxicity (measurements and monitoring standards) through the questionnaires.</p> <p>The TWG to decide at a later stage, based on the availability and comparability of the data collected through the questionnaires, whether BAT-AELs for toxicity should be derived.</p>
Metals	<p>To include Arsenic and its compounds (as As), Cadmium and its compounds (as Cd), Chromium and its compounds (as Cr), Copper and its compounds (as Cu), Lead and its compounds (as Pb), Nickel and its compounds (as Ni), Zinc and its compounds (as Zn) as KEIs for plating and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to water.</p> <p>To include Cr(VI) as a KEI and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for Cr(VI) emissions to water.</p> <p>To include as KEIs the following metals and their compounds: Ag, Al, B, Ba, Co, Fe, Sb, Se and Sn and to collect data through the plant-specific questionnaires. The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs for emissions of these metals should be derived.</p>
Sulphides and organosulphides	<p>To include sulphides and organosulphides as a KEI and to collect information and data on uses and relevant processes in the STM activities.</p> <p>To collect data on sulphides and organosulphides emissions to water through the plant-specific questionnaires. The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs for sulphides and organosulphides emissions to water should be derived.</p> <p>The TWG (e.g. DE) to provide information on the reference method applied for the monitoring of organosulphides.</p>

Substance(s) or parameters	KoM conclusions
TOC and COD	To include both COD and TOC as KEIs and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for both TOC and COD, with the possibility to use only one of the two, but with preference being given to TOC.
Fluorides	To include fluorides as a KEI for various processes (scouring, passivation, polishing and coating) and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to water.
Halogenated organic compounds	To include halogenated organic compounds (as AOX) as a KEI for waste water treatment and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to water. To collect data through the questionnaires about the sources of AOX in discharged waste water streams, e.g. type of agents used in waste water treatment.
Phenols	To include phenols (as phenol index) as a KEI for degreasing and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to water.
Phosphates and Total P	To include total phosphorus as a KEI and to collect information and data on total phosphorus emissions to water with the aim to derive BAT-AELs for emissions to water.
Chlorides	To include chlorides (as total Cl) as a KEI for plating and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to water.
Cyanides and free CN	To include cyanide and free CN as KEIs and to collect information and data on both parameters and relevant processes with the aim to derive BAT-AELs for emissions to water.
Total nitrogen	To include total nitrogen as a KEI for degreasing and plating and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to water.
Parameters proposed as contextual information	To include the following parameters: sulphates, conductivity and pH as contextual information for emissions to water.
Suspended Solids & TSS	To include TSS as a KEI and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to water.
Hydrocarbon Oil Index	To include HOI as a KEI and to collect data through the plant-specific questionnaires with the aim to derive BAT-AELs for emissions to water.

Table 5 lists the substances for which the conclusion reached during the meeting was to exclude them from the STM BREF review.

Table 5: KEIs for emissions to water excluded from the review of the STM BREF

Substance(s) or parameters	KoM conclusions
Formaldehyde	Not to include formaldehyde as a KEI and not to collect data on formaldehyde emissions to water.

Metals	Not to include as KEIs the following metals and their compounds: Hg, Mg, Mn, Mo and Ti and not to collect data on their emissions to water.
A, B, C substances	Not to include A, B, C substances (according to the Danish guidelines) as a KEI and not to collect data on emissions to water of A, B, C substances.
CMR substances	Not to include CMR substances as a group as a KEI and not to collect data on emissions to water of CMR substances as a group.
POPs	Not to include POP substances as a group as a KEI and not to collect data on emissions to water of POP substances as a group.
Sum of PAHs	Not to include PAHs (as a sum parameter) as a KEI and not to collect data on PAH emissions to water.
SVHCs	Not to include SVHCs as a group as a KEI and not to collect data on emissions to water of SVHCs as a group.
Nitrite (NO₂)	Not to include nitrite as a KEI and not to collect data on emissions to water of nitrites.
Bisphenol A	Not to include 4,4'-isopropylidenediphenol (bisphenol A - BPA) as a KEI. To collect information on BPA emissions to water from PCB manufacturing and to include it in the descriptive part of the BREF. The TWG (e.g. BE) to provide relevant available information.

5 CONSUMPTION, WATER DISCHARGE AND WASTE/BY-PRODUCTS GENERATION

5.1 Consumption of energy

In BP Section 2.2.5, the EIPPCB proposed the following:

- To include specific energy consumption at plant level as a KEI and to collect data through plant-specific questionnaires with the aim to derive BAT-AEPLs.
- To collect data on specific energy consumption at process level (e.g. heating of vats, drying, workspace heating, electrolytic and electrochemical processes) through plant-specific questionnaires.
- The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AEPLs on specific energy consumption at process level should be derived.
- The TWG to identify the contextual information (e.g. applied techniques, type of processes, fuels used, substrate/workpiece specifications, methods used for monitoring and calculation, plant configuration and boundaries defined, level of aggregation of consumption data) needed to understand and compare the data collected through plant-specific questionnaires.

The TWG discussed the proposal at length. Several MS and industrial organisations expressed the opinion that BAT-AEPLs for specific energy consumption are extremely difficult to derive as the data are not comparable and depend on various parameters. They also noted that it would not be useful to express the specific energy consumption per surface area as this is not the proper unit for all cases. Other MS and one environmental NGO voiced the opinion that one should first collect data and that the TWG should decide at a later stage, taking into consideration the data collected, on the possible derivation of BAT-AEPLs.

Two revised proposals were presented and discussed with a view to reaching a consensus, clarify wording and ensure consistency with other KoM conclusions. At the end of the discussion, a consensus reached was on the following conclusions.

Conclusions reached by the TWG:

- To include specific energy consumption as a KEI.
- To collect data on specific energy consumption at plant and process level (e.g. heating of vats, drying, workspace heating, electrolytic and electrochemical processes) through plant-specific questionnaires.
- The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AEPLs on specific energy consumption at plant and/or process level should be derived.
- The TWG to identify the contextual information (e.g. applied energy efficiency techniques, type of processes, type of energy used (including fuel types), substrate/workpiece specifications, methods used for monitoring and calculation, plant configuration and boundaries defined, level of aggregation of consumption data) needed to understand and compare the data collected through plant-specific questionnaires. This will be dealt with in a web-based workshop at the initial stage of the questionnaire development.

5.2 Consumption of water and waste water discharge

In BP Section 2.2.8, the EIPPCB proposed the following:

- To include specific water consumption and specific waste water discharge as KEIs and to collect data through plant-specific questionnaires.
- The TWG to identify the contextual information (e.g. applied techniques, type of processes, product specifications, methods used for monitoring and calculation, plant configuration and boundaries defined, level of aggregation of consumption data) needed to understand and compare the data collected through plant-specific questionnaires.
- The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AEPLs on specific water consumption and/or waste water discharge should be derived.
- To collect data on the water recycling rate as contextual information through plant-specific questionnaires.

The TWG discussed the proposal in detail. One MS expressed the opinion that BAT-AEPLs for specific water consumption are extremely difficult to derive as the data are not comparable and depend on various parameters. Several MS expressed reservations about the identification of water recycling rate as a KEI. Another MS explained that specific waste water discharge would be a KEI and this parameter is regulated in this MS. Other MS agreed with the EIPPCB proposal. At the end of the discussion, the consensus reached was to maintain the EIPPCB proposal unchanged and to organise a web-based workshop at the initial stage of the questionnaire development related to the identification of the relevant contextual information to be collected.

Conclusions reached by the TWG:

- To include specific water consumption and specific waste water discharge as KEIs and to collect data through plant-specific questionnaires.
- The TWG to identify the contextual information (e.g. applied techniques, type of processes, product specifications, methods used for monitoring and calculation, plant configuration and boundaries defined, level of aggregation of consumption data) needed to understand and compare the data collected through plant-specific questionnaires.
- The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AEPLs on specific water consumption and/or waste water discharge should be derived.
- To collect data on the water recycling rate as contextual information through plant-specific questionnaires.

5.3 Selection of chemicals and substitution

In BP Section 2.2.7, the EIPPCB proposed the following:

- The TWG to define a manageable list of hazardous chemicals during the questionnaire development phase.
- Regarding the collection of data on specific consumption of hazardous chemicals through plant-specific questionnaires, see Section 2.2.9.
- To collect information on potential substitution techniques to prevent or reduce the use of hazardous chemicals (in particular CMR substances and SVHCs).

The TWG discussed the proposal in detail. One MS expressed the opinion that all parameters identified as KEIs should be included on the list, to expand the criteria for inclusion on the list (e.g. persistent, acute toxicity) and to try to keep the questionnaire simple with a clear list of the main

substances used in STM plants. Another MS agreed with the expansion of the list and proposed to focus on substances that are really in use as well as to use the commercial names of products used as these are known to operators. An environmental NGO proposed to focus on SVHCs and/or those included on the Candidate List of substances of very high concern for Authorisation. The ECHA representative briefly explained the principles for the list of chemical substances identified as relevant for the STM activity. The EIPPCB provided information on the status of ECHA in the STM TWG (observer) and its contribution to the STM BREF review process. At the end of the discussion, a consensus was reached to amend the EIPPCB proposal as follows.

Conclusions reached by the TWG:

- The TWG to define a manageable list of hazardous chemicals during the questionnaire development phase. This will be dealt with in a dedicated web-based workshop at the initial stage of the questionnaire development.
- Regarding the collection of data on specific consumption of hazardous chemicals through plant-specific questionnaires, see Section 2.2.9 (on consumption of raw materials and chemicals).
- To collect information on substitution techniques to prevent or reduce the use of hazardous chemicals (e.g. CMR substances and SVHCs, persistent and bioaccumulative).

Note: To ensure that the list of hazardous chemicals contains at least:

- the substances identified as KEIs, e.g. PFAS, complexing agents;
- information on the commercial name of the relevant chemical products used in the STM sector.

5.4 Decarbonisation

In BP Section 2.2.6, the EIPPCB proposed the following:

- To collect information on techniques aiming at the decarbonisation of the STM processes.
- To collect data on CO₂ emissions through the plant-specific questionnaires.
- The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs should be derived for CO₂ emissions.

One industrial organisation expressed the concern that in the event that the STM activity is part of a larger installation covered by the EU ETS (e.g. iron and steel production plant with FMP and STM activities included) CO₂ emissions from the STM activities are not relevant compared to those of the larger installation. The EIPPCB explained that the exact formulation of the potential BAT conclusions on decarbonisation and CO₂ emissions will be agreed by the TWG at a later stage. At the end of the discussion, the consensus reached was to maintain the EIPPCB proposal unchanged.

Conclusions reached by the TWG:

- To collect information on techniques aiming at the decarbonisation of the STM processes.
- To collect data on CO₂ emissions through the plant-specific questionnaires.
- The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AELs should be derived for CO₂ emissions.

5.5 Consumption of raw materials and chemicals

In BP Section 2.2.9, the EIPPCB proposed the following:

- To include raw material consumption as a KEI and to collect information on techniques to increase the substitution of raw materials with waste and/or residues.
- To include the specific quantity of hazardous chemicals consumed for a manageable list of hazardous chemicals. The TWG to define this manageable list of hazardous chemicals during the questionnaire development phase.
- To collect data on the specific consumption of these hazardous chemicals through plant-specific questionnaires.
- The TWG to identify during the questionnaire development phase the contextual information (e.g. applied techniques, type of processes used, product specifications, plant configuration and definition of boundaries, level of aggregation of consumption data) needed to understand and compare the data collected through plant-specific questionnaires.
- The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AEPLs on the specific quantity of raw materials and hazardous chemicals consumed should be derived.

The TWG supported, in general, the EIPPCB proposal.

In the discussion, one MS and one industry association stated that different plant sizes, processes and materials are involved and that it could be difficult to compare plants and derive useful BAT-AEPLs due to this variability. Another MS expressed concerns about the terms used in the proposal: ‘waste/by-products/residues’ referring to the waste legislation, and one industry association reacted to explain that ‘residues’ include both waste and by-products. Another MS mentioned that raw materials used in the STM processes include chemicals. Finally, one industry association explained that substances are often used in mixtures and seeking information on the composition of raw materials may lead to confidentiality issues, so it may be difficult to know the quantity of hazardous chemicals consumed.

To accommodate these comments, the EIPPCB revised the proposal and presented the revisions to the TWG for discussion, including the organisation of a workshop at the initial stage of the questionnaire development.

Conclusions reached by the TWG:

- To include raw material consumption as a KEI and to collect data on the specific raw material consumption. To collect information on techniques used to decrease raw material consumption and on techniques used to increase the substitution of raw materials with residues.
- To collect data on the specific consumption of hazardous chemicals through the plant-specific questionnaires. To collect information on techniques used to decrease the consumption of hazardous chemicals.
- The TWG to identify during the questionnaire development phase the contextual information (e.g. applied techniques, type of processes used, product specifications, plant configuration and definition of boundaries, level of aggregation of consumption data) needed to understand and compare the data collected through plant-specific questionnaires. This will be dealt with in a web-based workshop at the initial stage of the questionnaire development.
- The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AEPLs on the specific quantity of raw materials and hazardous chemicals consumed should be derived.

5.6 Residues generation and circular economy

In BP Section 2.2.11, the EIPPCB proposed the following:

- To include generation of residues/wastes as a KEI and to collect data and contextual information on their quantities, composition and management (e.g. recovery, reuse, recycling, disposal).
- The TWG to decide during the questionnaire design which relevant detailed (contextual) information will be collected.
- To collect information on applied techniques for the reduction of generated waste and for the promotion of circularity of STM processes.

The TWG supported, in general, the EIPPCB proposal.

In the discussion, one industry association expressed the need to be consistent with other decisions for considering plant/installation level. One MS asked how BAT-AEPLs could be derived for this sector. Two MS added that information on quantity alone may not be informative unless it is linked to the plant size. One MS highlighted the importance of reporting the detailed type of residues and another MS mentioned especially for hazardous waste the Basel Convention. Another MS repeated its concern about the terms used in the proposal, ‘waste/by-products/residues’ referring to the waste legislation. Finally, one MS asked for the aim of collecting data to be specified.

Following the discussion, the EIPPCB presented an adapted proposal, which was adopted by the TWG together with the decision to organise a web-based workshop at the initial stage of the questionnaire development related to the identification of the relevant contextual information to be collected.

Conclusions reached by the TWG:

- To include generation of residues as a KEI and to collect data (at plant level) and contextual information on residue types (e.g. sludge, spent concentrates), specific quantities, composition and management (e.g. recovery, reuse, recycling, disposal).
- The TWG to decide during the questionnaire design which relevant detailed (contextual) information will be collected.
- To collect information on applied techniques for the reduction of generated waste and for the promotion of circularity of STM processes.
- The TWG to decide at a later stage, based on the data collected through the questionnaires, whether BAT-AEPLs should be derived for specific parameters (e.g. specific quantity of waste reused/recycled/sent for disposal).

5.7 Industrial symbiosis

In BP Section 2.2.10, the EIPPCB proposed the following:

- The TWG to provide written contributions on the processes and techniques facilitating industrial symbiosis and optimising resource consumption in order to be considered in the STM BREF review.

In the discussion, one MS asked for a confirmation about the possibility to provide information using the 10-heading template to describe the techniques. Another MS asked whether data or information would be collected through the plant-specific questionnaires. One industry association and one MS asked for a clear definition of industrial symbiosis. The industry association expressed concern considering that this is not covered by the IED, and should instead be addressed under circular economy regulation.

To accommodate these comments, the EIPPCB revised the proposal clarifying how the information will be provided and presented the revisions to the TWG for discussion, who reached a consensus as follows.

Conclusions reached by the TWG:

- The TWG to provide information (e.g. using the 10-heading template) on techniques that promote industrial symbiosis and optimise resource consumption.
- To collect information on applied industrial symbiosis techniques through the plant-specific questionnaires.

6 INFORMATION AND DATA COLLECTION

6.1 General

6.1.1 Expression of BAT-AELs for emissions to air/water

In BP Section 2.3.1.1, the EIPPCB proposed the following:

- To generally express BAT-AELs for channelled emissions to air and to water in concentrations, and, if deemed appropriate, also as specific loads.
- To clearly define (during the drafting of the questionnaire) all parameters influencing emission concentrations or loads (e.g. techniques used, reference conditions, type and quantity of processes/products/raw materials, boundaries of the process/system, direct/indirect discharge, sources and characteristics of waste gases and waste waters, specific operating conditions).

The TWG supported the EIPPCB proposal to generally express BAT-AELs for emissions to air and to water in concentrations and/or if deemed appropriate as specific loads.

Conclusions reached by the TWG:

- To generally express BAT-AELs for channelled emissions to air and to water in concentrations, and, if deemed appropriate, also as specific loads.
- To clearly define (during the drafting of the questionnaire) all parameters influencing emission concentrations or loads (e.g. techniques used, reference conditions, type and quantity of processes/products/raw materials, boundaries of the process/system, direct/indirect discharge, sources and characteristics of waste gases and waste waters, specific operating conditions).

6.1.2 Averaging periods for BAT-AELs for emissions to air/water

In BP Section 2.3.1.2, the EIPPCB proposed the following:

- For channelled emissions to air, to generally express BAT-AELs as short-term averages, i.e. as daily averages (for continuous measurements) or as averages over the sampling period (for periodic measurements).
- For emissions to water, to generally express BAT-AELs, in the case of continuous discharges as daily average values obtained via 24-hour flow-proportional composite samples and in the case of batch discharges as average values over the release duration obtained via flow-proportional composite samples. The TWG to decide at a later stage which other sampling techniques could be considered appropriate.

The TWG broadly agreed with the EIPPCB proposal. During the KoM, one MS suggested to also include spot sampling as an option for batch discharges to water as according to the national legislation some parameters are not allowed to be measured by mixed samples. At the end of the discussion, the consensus reached was to maintain the EIPPCB proposal unchanged.

Conclusions reached by the TWG:

- For channelled emissions to air, to generally express BAT-AELs as short-term averages, i.e. as daily averages (for continuous measurements) or as averages over the sampling period (for periodic measurements).
- For emissions to water, to generally express BAT-AELs, in the case of continuous discharges as daily average values obtained via 24-hour flow-proportional composite samples and in the case of batch discharges as average values over the release duration obtained via flow-proportional composite samples. The TWG to decide at a later stage which other sampling techniques could be considered appropriate.

6.1.3 Environmental performance levels

In BP Section 2.3.1.3, the EIPPCB proposed the following:

- To collect data on the specific energy consumption of the processes/plants as the ratio of the respective energy consumption divided by a suitable activity rate figure and expressed as yearly averages.
- To collect data on the specific water consumption of the plants as the ratio of the total water consumption divided by a suitable activity rate figure and expressed as yearly averages. These data may be complemented by data on specific water discharge.
- To collect data on the water recycling rate of the plants as a percentage and expressed as yearly averages.
- To collect data on the specific consumption of the raw materials with emphasis on hazardous chemicals (to be identified during the drafting of the questionnaire) as the ratio of the total consumption at plant level divided by a suitable activity rate figure and expressed as yearly averages.
- To collect data on the waste recycling rate of the plants as a percentage and expressed as yearly averages.

The TWG broadly agreed with the EIPPCB proposal. During the KoM, the environmental NGO suggested the addition of a reference to the specific waste generation parameter (omitted by mistake in the proposal).

Conclusions reached by the TWG:

- To collect data on the specific energy consumption of the processes/plants as the ratio of the respective energy consumption divided by a suitable activity rate figure and expressed as yearly averages.
- To collect data on the specific water consumption and specific waste water discharge of the plants as the ratio of the total water consumption/waste water discharge divided by a suitable activity rate figure and expressed as yearly averages.
- To collect data on the specific quantity of waste reused/recycled/sent for disposal as the ratio of the total waste quantity reused/recycled/sent for disposal, divided by a suitable activity rate figure and expressed as yearly averages.
- To collect data on the water recycling rate of the plants as a percentage and expressed as yearly averages.
- To collect data on the specific consumption of the raw materials with emphasis on hazardous chemicals (to be identified during the drafting of the questionnaire) as the ratio of the total consumption at plant level divided by a suitable activity rate figure and expressed as yearly averages.
- To collect data on the waste recycling rate of the plants as a percentage and expressed as yearly averages.
- A web-based workshop will be organised at the initial stage of the questionnaire development phase to address key issues, e.g. suitable activity rate units, operating parameters.

6.2 Selection of plants

6.2.1 Surface treatment of metals or plastics installations in the EU

In BP Section 3.4.1, the EIPPCB proposed the following:

- To collect data from well-performing IED plants carrying out activity 2.6 of Annex I to the IED.

The proposal was not foreseen for discussion at the KoM. The original EIPPCB proposal was adopted without any change.

Conclusions reached by the TWG:

- To collect data from well-performing IED plants carrying out activity 2.6 of Annex I to the IED.

6.2.2 Selection of plants/installations for the plant-specific information and data collection

In BP Section 3.4.2, the EIPPCB proposed the following:

- The TWG to complete its proposals of well-performing (including best-performing) plants/installations to be included in the data collection.

The proposal was not foreseen for discussion at the KoM. The original EIPPCB proposal was adopted without any change.

Conclusions reached by the TWG:

- The TWG to complete its proposals of well-performing (including best-performing) plants/installations to be included in the data collection.

6.3 Questionnaire for gathering plant-specific information and data

6.3.1 Data collection procedure

In BP Section 3.4.3.1, the EIPPCB proposed the following:

To follow the established BREF process for the collection of plant/installation-specific data via questionnaires including the following:

- the preparation of the draft questionnaire by the EIPPCB followed by the commenting of the whole TWG, if necessary in several iterations;
- if deemed necessary, the organisation of a questionnaire workshop to finalise the questionnaire;
- the testing of the draft final questionnaire by a selected (small) number of plants/installations;
- the preparation of the final questionnaire by the EIPPCB;
- the distribution of the final questionnaire through Member States' representatives;
- the filling in of the questionnaires by the plants/installations;
- the collection of the filled-in questionnaires by Member States' representatives;
- the quality check of the filled-in questionnaires by Member States' representatives (possibly) with the help of a checklist that the TWG and the EIPPCB could have developed;
- the submission of the quality-checked questionnaires to the TWG by Member States' representatives:
 - for the non-confidential version: submission to the TWG via BATIS;
 - for the confidential version: submission to the EIPPCB via email;
- the TWG decides on the content and format of the questionnaire during the preparation as described above;
- to collect data over the last 3 reference years for which data are considered representative.

The proposal was not foreseen for discussion at the KoM. The original EIPPCB proposal was adopted without any change.

Conclusions reached by the TWG:

To follow the established BREF process for the collection of plant/installation-specific data via questionnaires including the following:

- the preparation of the draft questionnaire by the EIPPCB followed by the commenting of the whole TWG, if necessary in several iterations;
- if deemed necessary, the organisation of a questionnaire workshop to finalise the questionnaire;
- the testing of the draft final questionnaire by a selected (small) number of plants/installations;
- the preparation of the final questionnaire by the EIPPCB;
- the distribution of the final questionnaire through Member States' representatives;
- the filling in of the questionnaires by the plants/installations;
- the collection of the filled-in questionnaires by Member States' representatives;
- the quality check of the filled-in questionnaires by Member States' representatives (possibly) with the help of a checklist that the TWG and the EIPPCB could have developed;
- the submission of the quality-checked questionnaires to the TWG by Member States' representatives:
 - for the non-confidential version: submission to the TWG via BATIS;
 - for the confidential version: submission to the EIPPCB via email;
- the TWG decides on the content and format of the questionnaire during the preparation as described above;
- the collection of data over the last 3 reference years for which data are considered representative.

6.3.2 Collection of data at process level

In BP Section 3.4.3.2, the EIPPCB proposed the following:

- The TWG to decide during the questionnaire drafting phase if data and contextual information will be collected at process level and for which processes, based on the foreseen data availability.

The proposal was not foreseen for discussion at the KoM. The original EIPPCB proposal was adopted without any change.

Conclusions reached by the TWG:

- The TWG to decide during the questionnaire drafting phase if data and contextual information will be collected at process level and for which processes, based on the foreseen data availability.

6.4 Confidentiality issues

In BP Section 2.3.2, the EIPPCB proposed the following:

- To design the questionnaire in a way that avoids requesting confidential data as much as possible so that all data provided by operators can be posted directly onto BATIS by Member States' representatives and thus shared with the whole TWG.
- The TWG to decide at a later stage (i.e. during the questionnaire development) about the type and format of potentially confidential information that needs to be collected.
- The Member States' representatives in the TWG to: i) submit the versions of the questionnaires containing the confidential information directly to the EIPPCB via email, and ii) post the versions of the questionnaires containing the non-confidential information onto BATIS.

The EIPPCB presented the principles for data collection and the treatment of confidentiality issues according to Sections 5.2-3 in the BREF Guidance and based on the experience gained during the drafting/reviewing of recent BREFs (e.g. FMP, TXT, WGC).

A MS expressed the opinion that it is not possible to avoid the collection of CBI. Another MS stated that the only information which could potentially be considered CBI in the STM sector is, for example, the exact composition of the content of the vat, the number of successive treatments carried out and the sequence in which these treatments are actually carried out. However, for the STM sector, information on energy or water consumption should not be considered CBI. An environmental NGO expressed the view that there is a need to agree during the KoM on what constitutes CBI, while various MS proposed to postpone this decision to a later stage (during the questionnaire development phase).

In the discussion, the EIPPCB highlighted that there is a well-established procedure to protect CBI. In the event that part of the data in the questionnaire is considered CBI, solutions already tested need to be explored to present such data in physical or web-based meetings.

A slightly revised proposal was concluded with the addition of the last bullet point which was omitted by mistake in the EIPPCB proposal.

Conclusions reached by the TWG:

- To design the questionnaire in a way that avoids requesting confidential data as much as possible so that all data provided by operators can be posted directly onto BATIS by Member States' representatives and thus shared with the whole TWG.
- The TWG to decide at a later stage (i.e. during the questionnaire development) about the type and format of potentially confidential information that needs to be collected.
- In the event that certain data are considered CBI:
 - the Member States' representatives in the TWG to: i) submit the versions of the questionnaires containing the confidential information directly to the EIPPCB via email, and ii) post the versions of the questionnaires containing the non-confidential information onto BATIS;
 - the TWG to agree on specific measures on how data collected as CBI can be discussed and analysed, e.g. in closed physical and/or web-based TWG meetings, so as to ensure the largest possible participation of TWG members and minimise the risk of disclosure.

6.5 Introduction to BATIS

The EIPPCB introduced the new version of BATIS - the Best Available Techniques Information System, which is a piece of web-based software to facilitate the exchange of information for the STM BREF review. More specifically, BATIS is used to manage the list of STM TWG members and observers and to make all data and information collected in the review process available to the TWG.

The EIPPCB provided hands-on guidance on basic BATIS features, e.g. obtaining and changing login credentials, reviewing and adapting personal information, the basic structure of STM BREF folders, and adding new posts, uploading and downloading documents.

The TWG was invited to contact the EIPPCB for further technical questions or comments.

7 TECHNIQUES TO CONSIDER IN THE DETERMINATION OF BAT

7.1 Generic techniques in the ENE, EFS and ICS BREFs

In BP Section 3.5.1, the EIPPCB proposed to refer to ‘horizontal’ BREFs for generic techniques and include in the revised STM BREF only techniques that are specific to the sector. The proposal was not foreseen for discussion in the KoM; TWG members did not request to discuss it before or during the KoM and thus the EIPPCB proposal was adopted without change.

Conclusions reached by the TWG:

- To refer to ‘horizontal’ BREFs for generic techniques, namely to:
 - the ENE BREF for generic techniques associated with energy efficiency;
 - the EFS BREF for generic techniques associated with the storage, transfer and handling of materials;
 - the ICS BREF for generic industrial cooling systems;
- and to include in the STM BREF only techniques that are specific to the STM industry.

7.2 Current STM BREF

In BP Section 3.5.2, the EIPPCB proposed to update and restructure the 2006 STM BREF with the aim of adding BAT candidates. The proposal was not foreseen for discussion in the KoM and before the KoM one TWG member requested to discuss it. During the meeting, the TWG member indicated that finally they would rather discuss this at the questionnaire development stage.

The EIPPCB proposal was adopted without change.

Conclusions reached by the TWG:

- To take into account all the available information during the drafting of the revised STM BREF, for the updating and restructuring of its chapter ‘Techniques to consider in the determination of BAT’ (Chapter 4).
- The TWG to provide information using the standard 10-heading template to update the relevant techniques in Chapter 4 of the current STM BREF.

7.3 Emerging techniques in the current STM BREF

In BP Section 3.5.3, the EIPPCB made a proposal on how to collect and update information on emerging techniques when reviewing the STM BREF. The proposal was not foreseen for discussion in the KoM and before the KoM one TWG member requested to discuss it, in relation to possible negative impacts on legal coherence and doubts on applicability. During the meeting the TWG member indicated that finally they would rather discuss this at the questionnaire development stage.

The EIPPCB proposal was adopted.

Conclusions reached by the TWG:

- To take into account the information provided for the drafting of the revised STM BREF.
- The TWG to provide information on these techniques using the standard 10-heading template.

7.4 Additional techniques

In BP Section 3.5.4, the EIPPCB made a proposal on how to collect and update information on additional techniques for the review of the STM BREF. The proposal was not foreseen for discussion in the KoM and it was adopted.

Conclusions reached by the TWG:

- To take into account all the available information for the drafting of the revised STM BREF.
- The TWG to provide information on these techniques using the standard 10-heading template.

In addition, one MS proposed to discuss the issue of the retention of firefighting water in the STM sector and presented the topic. Another MS was of the view that the IED does not deal with accidental risks, which are instead addressed by national regulations and the Seveso Directive. The EIPPCB recalled that fires occur under OTNOC (other than normal operating conditions), which are part of the BATC. All BREFs include recommendations on how to minimise the impact of OTNOC issues, and the case of the retention of firefighting water falls into this category. There was a general agreement within the TWG that this issue is relevant to the STM sector and should be included.

The following conclusion was adopted for this technique:

Conclusions reached by the TWG:

- To collect information on applied techniques for the retention of firefighting water (e.g. for production and storage areas) and to include this information in the BREF with the aim to complement BAT, e.g. on soil, ground water and surface water protection.
- The TWG (e.g. DE, FI) to provide relevant information, e.g. with regards to volume, capacity, accident management plans.

8 NEXT STEPS TO BE TAKEN AFTER THE KICK-OFF MEETING

The EIPPCB presented a tentative timeline for the next steps of the STM BREF review. Following the discussion, the TWG agreed on the timeline shown in Table 6 and Figure 1.

Table 6: Next steps - tentative timeline of the STM BREF review

Steps	Targeted time
TWG to provide input on the chemicals used (e.g. DE to provide list of commercial names of products used)	June – August 2022
TWG to provide input on contextual information needed for the collection and analysis of data on specific consumption or discharges (e.g. type of processes, substrate/workpiece specifications, methods used for monitoring and calculation, plant configuration and boundaries defined, units for monitoring)	June – August 2022
Web-based workshop on the list of chemicals used in the STM sector	1 st half September 2022
Web-based workshop on contextual information needed for the collection and analysis of data on specific consumption or discharges	1 st half September 2022
EIPPCB to issue the first draft questionnaire template	2 nd half September 2022
TWG feedback on the first draft questionnaire	2 nd half October 2022
EIPPCB to issue the second draft questionnaire	1 st half November 2022
TWG feedback on the second draft questionnaire – Workshop on the questionnaire finalisation (if necessary)	2 nd half November 2022
TWG to provide proposals of well-performing plants for the data collection via questionnaire	2 nd half November 2022
EIPPCB to compile the list of well-performing plants and to check its completeness; if necessary, EIPPCB to ask TWG members to amend/complete the list	1 st half December 2022
EIPPCB to issue the third draft questionnaire	1 st half December 2022
Questionnaire testing	1 st half January 2023
EIPPCB to issue the final questionnaire to the TWG and distribution to the participating plants through the Member States' representatives	2 nd half January 2023
TWG to provide bulk information in order to update the text of the STM BREF, namely information on applied processes and techniques, on the techniques to consider for the determination of BAT and on emerging techniques	2 nd half January 2023
Submission of filled-in questionnaires in BATIS	2 nd half April 2023
First data assessment workshop	September 2023
First formal draft (D1) of the revised STM BREF	Q1 of 2024
TWG comment on STM BREF D1	Q2 of 2024
Second data assessment workshop	Q3 of 2024
Final TWG meeting	Q4 of 2024 / Q1 of 2025
Final draft of the revised STM BREF delivered to the IED Article 13 Forum	Q3 of 2025
Voting of BAT conclusions by IED Article 75 Committee	Q1 of 2026
Publication of the BAT conclusions in the Official Journal of the European Union	Q3 of 2026
Publication of the STM BREF on the EIPPCB website	Q3 of 2026

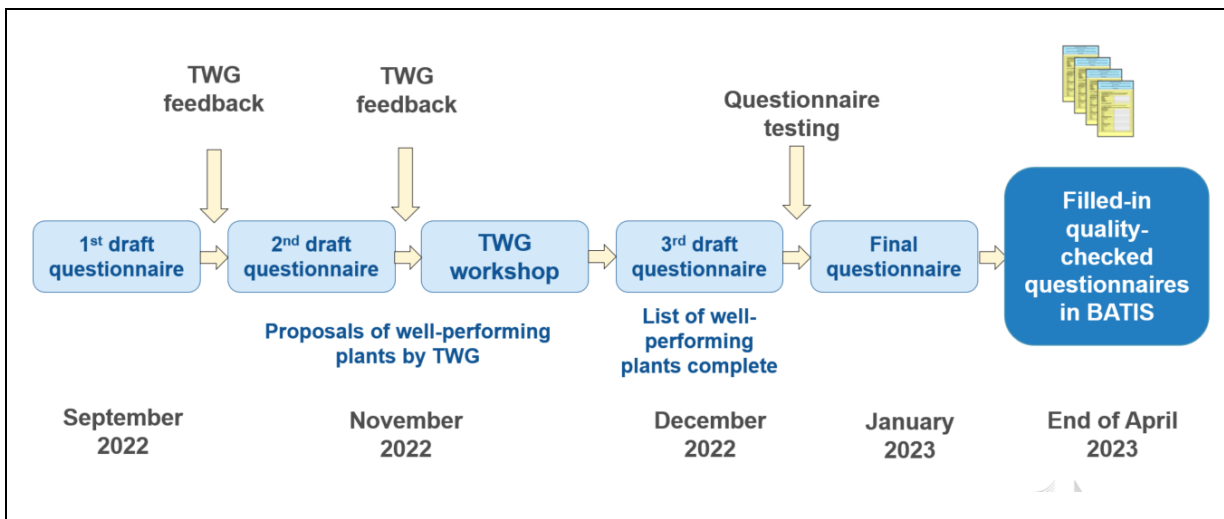


Figure 1: Next steps – tentative timeline of the data collection for the STM BREF review

8.1 Site visits

The EIPPCB explained the objectives and modalities of site visits according to Section 4.4.4 of the BREF Guidance. Site visits constitute an important part of the STM BREF review. They provide an insight into the production/techniques of the STM sectors covered in the STM BREF; visited sites should also participate in the data collection.

One MS stated that they have already started planning site visits and another MS stated that they are exploring options for additional site visits with the industry.

The EIPPCB invites proposals for site visits.

ANNEX I: STANDARD STRUCTURE FOR DESCRIBING ‘TECHNIQUES TO CONSIDER IN THE DETERMINATION OF BAT’

When providing information on ‘Techniques to consider in the determination of BAT’, a standard structure has to be used. This allows the assessment of techniques and the determination of BAT in an objective manner based on the definitions in the IED. The standard structure will be followed in the STM BREF and is stipulated by the BREF Guidance in Commission Implementing Decision 2012/119/EU (for details, see Table A1 below).

Table A1: Standard structure for describing ‘Techniques to consider in the determination of BAT’ (so-called BAT candidate techniques)

Type of information	Description of the information to be included in the BREF	Important information to collect and to report
Description	A brief description of the technique with a view to being used in the BAT conclusions.	
Technical description	A detailed and concise technical description of the technique (including chemical or other equations, pictures, diagrams and flow charts when appropriate).	The description can include both prevention and control techniques (in-process and end-of-pipe).
Achieved environmental benefits	The main potential environmental benefits (including reduced consumption of energy, reduced emissions to water, air and land, raw material savings as well as production yield increases, reduced waste, etc.) to be gained through implementing the technique.	
Environmental performance and operational data	Actual plant-specific performance data (including consumption and emission levels, consumption levels – of raw materials, water, energy – amounts of residues/wastes generated, including reference conditions – e.g. O ₂ level – and monitoring methods used) achievable applying the technique. Any other information on how to design, operate, maintain and control the technique.	<p><u>Emission data:</u></p> <ul style="list-style-type: none"> • Both the concentration and (specific) load of pollutant(s) (if available) or the data needed to derive this information. For specific load data, the product referred to should be clearly defined. • The quantity of the pollutant before and after the abatement system in order to determine the abatement efficiency. • Details of relevant operating conditions (percentage of full capacity, fuel composition, bypassing of the abatement technique, inclusion or exclusion of other than normal operating conditions, reference conditions). • Emission monitoring issues (including information on frequency, averaging period, uncertainties, plant operating condition, etc.). <p><u>Consumption data:</u></p> <ul style="list-style-type: none"> • The type and amount of fuel, energy (heat, electricity), water and raw materials/chemicals consumed/used by the technique. <p><u>Waste:</u></p> <ul style="list-style-type: none"> • The type and quantities of waste generated and treatment/disposal methods and/or techniques to prevent waste. <p><u>Others:</u></p>

Type of information	Description of the information to be included in the BREF	Important information to collect and to report
		<ul style="list-style-type: none"> • Sensitivity and durability of the technique. • Operation/control/maintenance issues. • Issues regarding accident prevention.
Cross-media effects	<p>Relevant negative environmental effects due to implementing the technique, allowing a comparison amongst techniques in order to assess the impact on the environment as a whole (such as consumption and nature of raw materials and water, energy consumption and contribution to climate change, stratospheric ozone depletion potential, photochemical ozone creation potential, acidification resulting from emissions to air, particulate matter in ambient air (including microparticles and metals), eutrophication of land and waters resulting from emissions to air or water, oxygen depletion potential in water, persistent/toxic/bioaccumulable components (including metals), generation of residues/waste, limitation of the ability to reuse or recycle residues/waste, generation of noise and/or odour, increased risk of accidents.</p>	<p>The Reference Document on Economics and Cross-media Effects (ECM) is a document that should be taken into account with regard to cross-media aspects as far as there are significant cross-media effects. This document is available from the European IPPC Bureau website at http://eippcb.jrc.ec.europa.eu/reference/BREF/ecm_bref_0706.pdf</p>
Technical considerations relevant to applicability	<p>Indication as to whether the technique can be applied throughout the sector; otherwise, information on the main general technical restrictions on the use of the technique (including an indication of the type of plants or processes within the sector to which the technique cannot be applied, and constraints to implementation).</p>	
Economics	<p>Information on costs (both investment and operational) and possible savings, including details on how these costs have been calculated</p>	<ul style="list-style-type: none"> • Capital/investment, operating and maintenance costs including details on how these costs/savings have been calculated/estimated. • Possible savings (including payback time), including details on how these costs/savings have been calculated/estimated. • Cost data will preferably be given in euros (EUR). If a conversion is made from another currency, the data in the original currency and the year when the data were collected will be indicated. This is important as conversion rates vary over time. • Price/cost of equipment or service will be accompanied by the year it was purchased. • Information relevant to both new and existing plants enabling, where possible, the determination of the economic viability of the technique for the sector concerned. • Information on the cost-effectiveness of the technique (e.g. in EUR per abated mass of pollutant), where relevant. <p>The Reference Document on Economics and Cross-media Effects (ECM) and the</p>

Type of information	Description of the information to be included in the BREF	Important information to collect and to report
		JRC Reference Report on Monitoring of Emissions to Air and Water from IED Installations (ROM) should be taken into account with regard to economic aspects and monitoring costs, respectively. Both documents are available from the European IPPC Bureau website at http://eippcb.jrc.ec.europa.eu/reference/
Driving force for implementation	Local conditions or requirements (e.g. legislation, safety measures) or non-environmental triggers (e.g. increased yield, improved product quality, economic incentives) which drive or may stimulate implementation. Information on reasons other than environmental ones for implementation.	Examples: <ul style="list-style-type: none"> • information on type/quality of receiving waters (e.g. temperature, salinity); • information on environmental quality standards; • information on the increase of production or productivity.
Example plants	Reference to plants in which the technique is implemented and from which information has been collected and used in writing the section, including an indication of the degree to which the technique is in use in the EU or worldwide.	
Reference literature	Literature or other reference material that was used in writing the section and that contains more detailed information. When the reference material consists of a large number of pages, reference will be made to the relevant page(s) or section(s).	