IAIA15

Impact assessment in the digital era

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Proposed Session:

'Alternative analysis for GhG reduction: what's good practice?'

'Pollution abatement improvements via BAT licensing for IPPC installations'

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1 - The Italian National Environmental IPPC Permits (1)

In Italy, IPPC Permit is one typology of authorization released into the environmental protection field to prevent and control pollution as an 'integrated authorization', allowing operation of industrial activities with specified production's characteristics and dimensions, both at national level (strategic) than at regional level.

1 - The Italian National Environmental IPPC Permits (2)

The list of the categories of these specific industrial activities is regulated by the Italian Law n. 59/2005 and s.m.i. (Italian Law n. 152/2006 and s.m.i.) that adopts and endorses the Directive n. 96/61/EC and s.m.i. (Directive 2008/1/EC and s.m.i.) concerning integrated pollution prevention and control.

These activities are normally developed inside industrial plants designed and built following preliminary SEA-EIA permits, if needed (if listed inside EIA-SEA regulations).

The IPPC Permits plan and perform an integrated prevention and control set in the exact point ('a la source') of pollution, that means that pollutants are declared, detected and controlled in the admission/emission points of the industrial activities, as well as of all the entire industrial plant's operation.

This means authorization of plants' operation controlling natural resources' usage, emissions and discharges in the environment, inside predefined limits and prescriptions, adopting a predefined monitoring framework, as self-controls on selected parameters, frequencies and methodologies, with a periodic reporting and planned inspections.

1 - The Italian National Environmental IPPC Permits (3)

In Italy, IPPC Permits are released by the Competent Authority, as:

- by IMELS for “strategic" activities;
- by other Authority designed by the Region or autonomous Province for other activities

The categories of these specific industrial IPPC activities of national interest are:

1. crude oil Refineries (excluding those producing only lube), gasification and liquefaction plants with more than 500 tons/day of coal or oil shale;
2. thermal Power Plants with more than 300 $_{MWt}$ of thermal power;
3. integrated Steelworks for first fusion of cast iron and steel;
4. a series of Chemical Plants with annual total production capacity superior to a minimum included between 100 and 300 millions of kg, depending on the specific class of product;
5. all other Plants under EIA that are fully localised on sea.

By its regulations, ISPRA provides technical and scientific support to the Italian Ministry for the Environment, Land and Sea (IMELS), and also in coordination of environmental inspections, monitoring and assessments, by the Italian Law n. 152/2006 and s.m.i. in a joint procedure for IPPC permits’ releases.

1 - The Italian National Environmental IPPC Permits (4)

IPPC Permits, among other information, contain a description of the activities, a comparison with the applicable 'Best Available Techniques', a set of emission limits values and of specific prescriptions, as well as a monitoring and control plan for each authorized installation, in which pollutants releases in the environment are controlled by measurements of selected parameters and frequencies with appropriate methodologies.

In this way, control and monitoring activities are performed all over the Italian Country, by means of a joint collaboration among IMELS (Competent Authority), ISPRA (National Control Authority) and ARPA-APPA (Local Control Authorities).

Predefined selected monitoring and control data are reported by authorized Plants' Owners and send to IMELS and ISPRA periodically (annually), while all other monitoring data are made available directly from the results of periodic enforcement and inspections performed by ISPRA, ARPA and APPA.

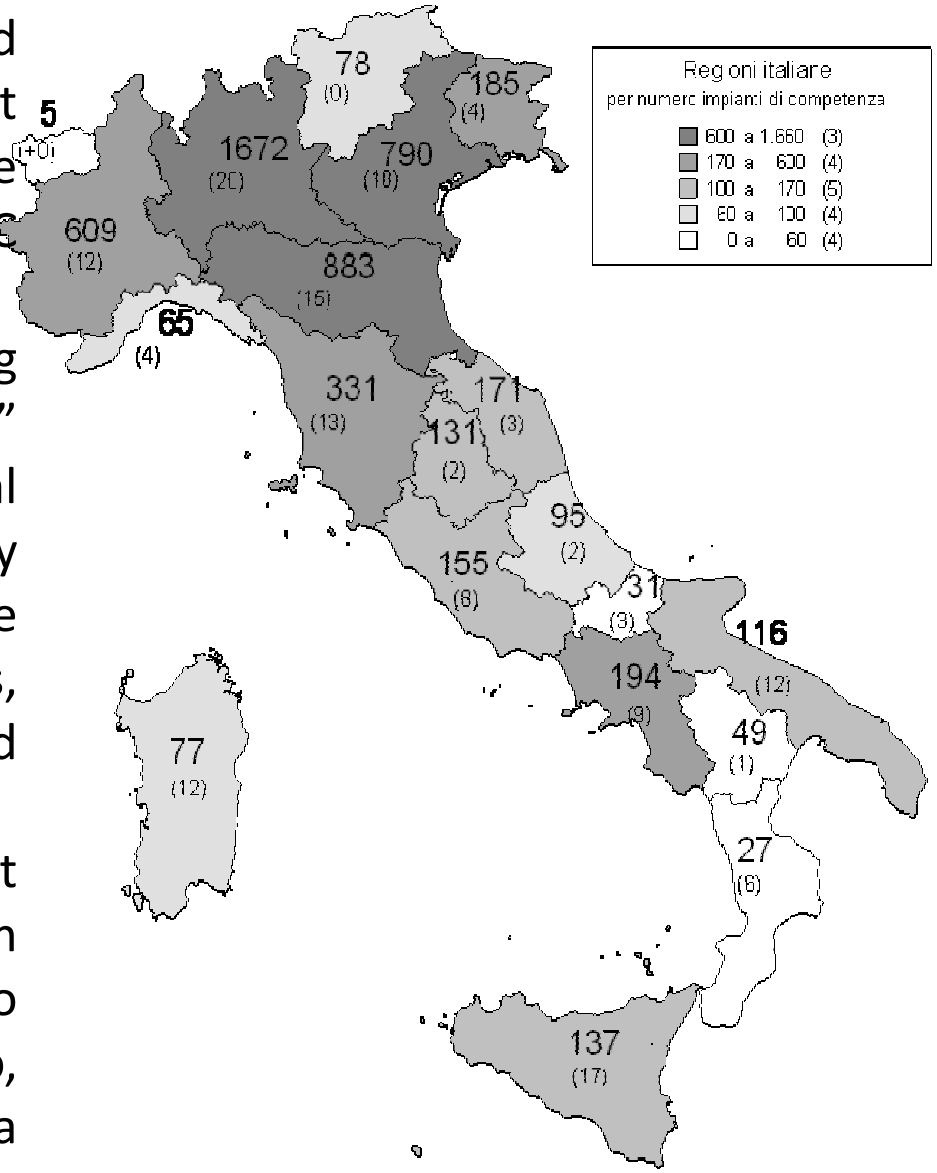
These data are available also for public information about the environment, allowing also public participation in IPPC permitting procedures, following 'Aarhus Convention'.

1 - The Italian National Environmental IPPC Permits (5)

Inside European Union about 50.000 Plants are subject to IPPC Permits and more than 5.800 in Italy in their different categories potentially harmful for the environmental (EU Report on IPPC Directive implementation 2005-2008).

In Italy, at December 2014, are operating about 175 activities so called “strategic” (with IPPC Permits released at national level) with 114 already existing and they are: 16 Crude Oil Refineries, 46 large Chemical Plants, 2 Integrated Steelworks, 111 Large Combustion Plants and Offshore Plants.

Other Plants receive IPPC permits at regional level and some of them, with more than 300 IPPC Plants, delegated to Provinces (Piemonte, Lombardia, Veneto, Trentino Alto Adige, Liguria, Emilia Romagna, Toscana, Lazio, Sardegna).



1. The Italian National Environmental IPPC Permits (6)

0 – STRATEGIC IPPC ACTIVITY OWNER → IPPC PERMIT REQUEST

1 - IMELS → 'IPPC PERMITS COMMITTEE' (with ISPRA technical support)

2 - IPPC PERMITS COMMITTEE → SUB-COMMISSION

SUB-COMMISSION → 'TECHNICAL INVESTIGATING GROUP'
(Referent Commissar, Commissars, ISPRA, Regions, Provinces, Municipalities, Owner if requested)

3, 4, 5 - ISPRA → Documentation analysis → 'Technical Recording Report' → Eventual further information request → 'Technical Analysis Investigation Report'

6 - 'TECHNICAL INVESTIGATING GROUP'
→ 'Technical Advice' to IMELS

IPPC BUREAU → BAT

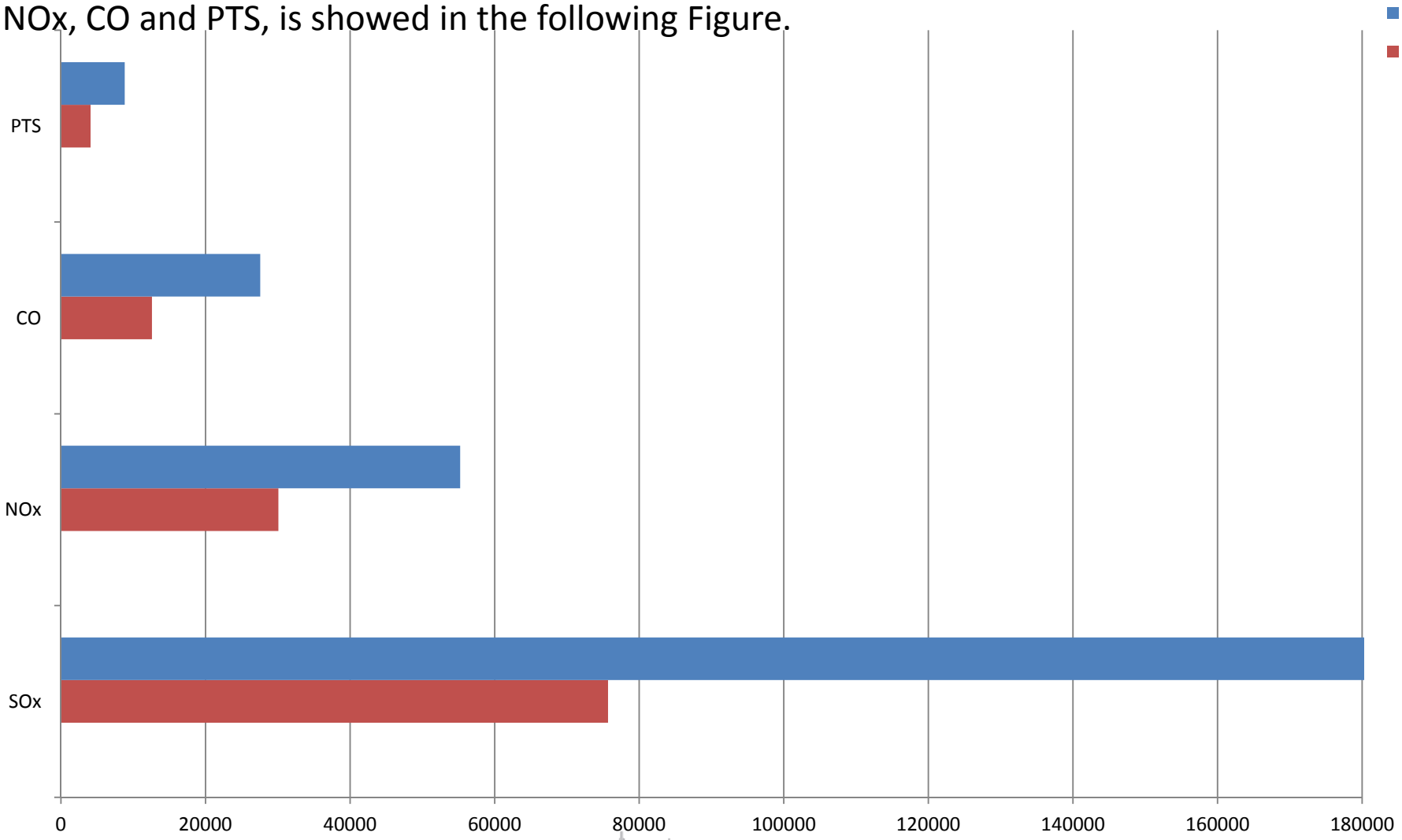
7 - ISPRA → Monitoring and Control Plan to 'Conference of Services' (through ISPRA technical support)

8,9 - IMELS →'CONFERENCE OF SERVICES'→ ***IPPC PERMIT RELEASE***

1 - The Italian National Environmental IPPC Permits (7)

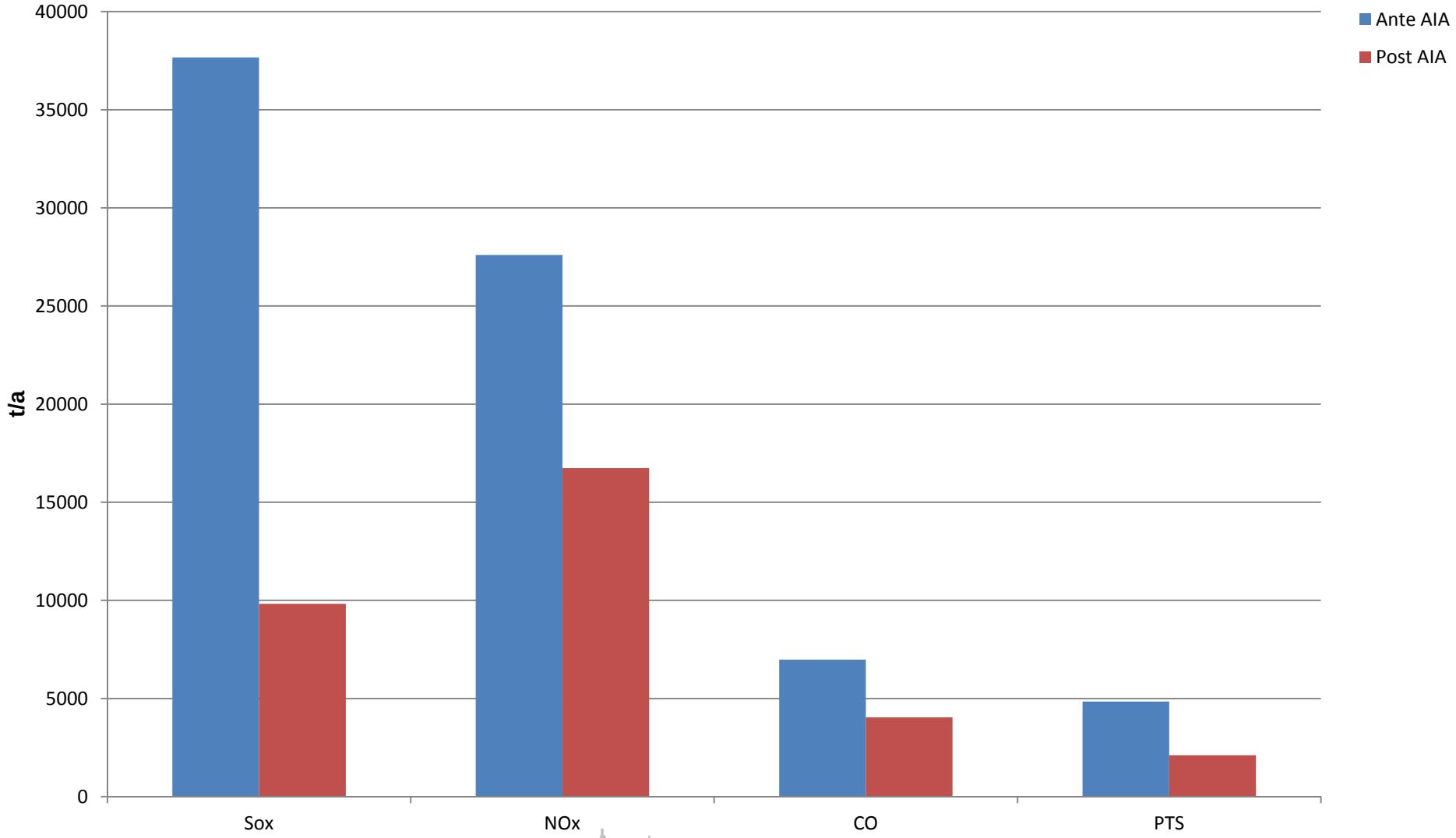
In Italy, at December 2014, every IPPC Plant have been licensed with IPPC Permits, in terms of first release, concluding authorization procedures.

For 16 Italian Refineries, the result in pollution abatement for macro pollutants, such as SOx, NOx, CO and PTS, is showed in the following Figure.



1 - The Italian National Environmental IPPC Permits (8)

For 46 Italian Chemical Plants, the result in pollution abatement for macro pollutants, such as SOx, NOx, CO and PTS, is showed in the following Figure.



2. Brefs' revision and 'BAT Conclusions' (1)

At the moment, this authorization procedures have been recently concluded both at national than at regional level without delays and the permits released are in the management phase of their first application and endorsement by Operators, also with some interesting 'open issues' – as well as 'technical problems/questions to be solved' - coming up to technical attention of both Competent Authorities (IMELS) and Control and Monitoring Institutions (ISPRA, ARPA/APPA), waiting for solutions and/or dedicated research.

IPPC operational permits have defined different scenarios of BAT implementation in IPPC industrial sites, where pollution is now under a planned control, in order:

1. to enforce BAT application and implementation inside new and existing IPPC Plants;

2. to strengthen IPPC Permits via harmonization of integrated management of air, water and soil pollutants emissions;

3. to perform a properly planned and adequate monitoring and data reporting activities and, if needed, also periodic inspections.

2. Brefs' revision and 'BAT Conclusions' (2)

A second phase of IPPC permits is starting, taking into account 'BAT Conclusions' issued in sectorial Brefs upgraded and also other environmental aspects, such as renewed attention towards sites, with new evaluations on site conditions in terms of production/release of pertinent hazardous substances, possibility of soil and groundwater contamination, soil vulnerabilities and available operational data.

For IPPC installations permitted at national level, these new regulations finalize existing IPPC permits by means of a 'review and renew' mechanism, focused on:

1.more tight respect – by now mandatory – towards new technologies application for more stringent limit values, as well as defined inside 'BAT Conclusions' of new Brefs;

2. greater attention – to be verified from time to time – towards siting environmental aspects, as managed only inside specific applicable standards;

3. a more detailed consideration of adequate control and monitoring systems inside IPPC installations.

2. Brefs' revision and 'BAT Conclusions' (3)

Recent regulatory innovations introduced by Legislative Decree n. 46/2014 – adopting in Italy the European Commission 'Industrial Emissions Directive' - led to the imposition, during operation of IPPC installations as specified in AIA Permits, of further specific indications/prescriptions as defined in new BAT for each IPPC sector, with revised emission limit values for pollutants released into the environment, as reported in "BAT Conclusions" of new reviewed BRefs.

This new approach applies to all IPPC installations subject to AIA Permits (first release) at national level, for which the new legislation requires an updating of existing authorizations, through new procedural "review/renewal" mechanisms, now closely linked to the identification of new technologies and the publication of BAT Conclusions.

2. Brefs' revision and 'BAT Conclusions' (4)

Till now, European Commission has already published in the Official Gazette of the European Union the following "BAT Conclusions":

•Implementing Decision of 09.12.2013 n. 2013/732 / EU, establishing BAT conclusions regarding the production of Chlor-Alkali;

•Implementing Decision of 10.09.2014 n. 2014/738 / EU, establishing BAT conclusions concerning the Refining of Oil and Gas;

•Implementing Decision of 28.02.2012 n. 2012/135 / EU, establishing BAT conclusions regarding the production of iron and steel;

•Implementing Decision of 28.02.2012 n. 2012/134 / EU, establishing BAT conclusions regarding the production of glass.

These documents, in addition to define best available technologies for operation of IPPC plants to which they refer, also identify best management techniques for a high level of environmental protection.

2. Brefs' revision and 'BAT Conclusions' (5)

Their contents have been widely analyzed and compared with past regulatory provisions leading to a final framework of tables providing a synthesis of environmental aspects and processes for which best available technologies, as "BAT Conclusions" are defined, related to 2 of the main categories of IPCC activities subject to AIA Permit at national level, and namely:

1 – 'Production of Chlor-Alkali';

2 – 'Refining of Oil and Gas';

while, for the 'Production of Iron and Steel', hereby in the follow is presented only a first rough synthesis.

2. Brefs' revision and 'BAT Conclusions' (6)

For the Production of Chlor-Alkali, Table 1 below shows the changes introduced by the BAT 17 that are subject to review of AIA, with an indication of reference elements of 'BAT Conclusions' versus those inside old Bref.

Table 1 – Chlor-Alkali Manufacturing industry

Reference Document on Best Available Techniques in the Chlor-Alkali Manufacturing industry (December 2001)

Best Available Techniques (BAT) conclusions, under Directive 2010/75/EU (December 2013)

***Cell technique (Mercury cell plants)* BAT**

Best available techniques specific to mercury cell plants is conversion to membrane cell technology. During the remaining life of mercury cell plants, all possible measures should be taken to protect the environment as a whole including: minimizing mercury losses to air, water and with products; minimizing current and future mercury emissions from handling, storage, treatment and disposal of mercury-contaminated wastes decommissioning carried out.

BAT 1 - The mercury cell technique cannot be considered BAT under any circumstances.

BAT 2 – To reduce emissions of mercury and the generation of waste contaminated with mercury during the decommissioning or conversion of mercury cell plants, BAT is to elaborate and implement a Decommissioning Plan.

BAT 3 - To reduce emissions of mercury to water during the decommissioning or conversion of mercury cell plants, BAT is to use one or a combination of listed techniques.

BAT AEL for mercury emissions to water, expressed as Hg, at the outlet of the mercury treatment unit during decommissioning or conversion is 3–15 µg/l in 24-hour flow-proportional composite samples taken daily (cfr. BAT 7).

OMISSIS

2. Brefs' revision and 'BAT Conclusions' (7)

For Crude Oil Refineries, Table 2 below shows the changes introduced by BAT 58, that are subject to updating of AIA with an indication of the reference elements of "BAT Conclusions" versus those inside old Bref.

Table 2 – Mineral Oil and Gas Refineries

Reference Document on Best Available Techniques for Mineral Oil and Gas Refineries (February 2003)

Best Available Techniques (BAT) conclusions, under Directive 2010/75/EU (October 2014)

GENERAL CONSIDERATIONS

Averaging periods and reference conditions of BAT AELs concerning emissions to air

Table 1

Reference conditions for BAT-AELs concerning emissions to air Reference conditions - Oxygen reference conditions (Combustion unit, Catalytic cracking process and Waste gas sulphur recovery unit). Averaging periods and reference conditions of BAT AELs concerning emissions to water

OMISSIS

2. Brefs' revision and 'BAT Conclusions' (8)

For the Production of Iron and Steel, Table 3 below shows a summary of broad maximum of the aspects that have been updated and revised in BAT 95 Bref versus those inside old Bref.

Table 3 – Iron and Steel Production
BAT CONCLUSIONS FOR IRON AND STEEL PRODUCTION (February 2012)

1. Environmental management systems
2. Energy management
3. Material management
4. Management of process residues such as by-products and waste
5. Diffuse dust emissions from materials storage, handling and transport of raw materials and (intermediate) products
6. Water and waste water management
7. Monitoring
8. Decommissioning
9. Noise
10. Process technologies: Sinter plants, Pellet plants, Coke oven plants, blast furnaces, Basic oxygen steelmaking and casting, Electric arc furnace steelmaking and casting

3. The ‘Baseline Report’ (1)

As result of the renewed attention given to the territory around IPPC installations and its environmental matrices, recent legislative innovative changes have introduced the obligation to draw up a ‘Baseline Report’ (as a ‘Soil Status Report’), which represents a new tool for assessing vulnerability conditions of the site versus hazardous substances produced/released/used during operation which can cause contamination of soil, subsoil and groundwater.

3. The 'Baseline Report' (2)

Underground water matrix knowledge in an IPPC site is important for its usage.

The 'capillar fringe' is the level of underground near the aeration area, just above the piezometric surface of a free groundwater layer, characterised by capillar water continuous and suspended (area above saturation zone with tight links).

Underground layers ecologically have very important roles (as feeder for springs and humid areas and surface water rivers) as water reservoirs (drinking water, agricultural water, industrial water, etc.).

3. The 'Baseline Report' (3)

The procedure to determine whether it is necessary to draw up a Baseline Report and, later, to write, can be divided into the following 3 phases:

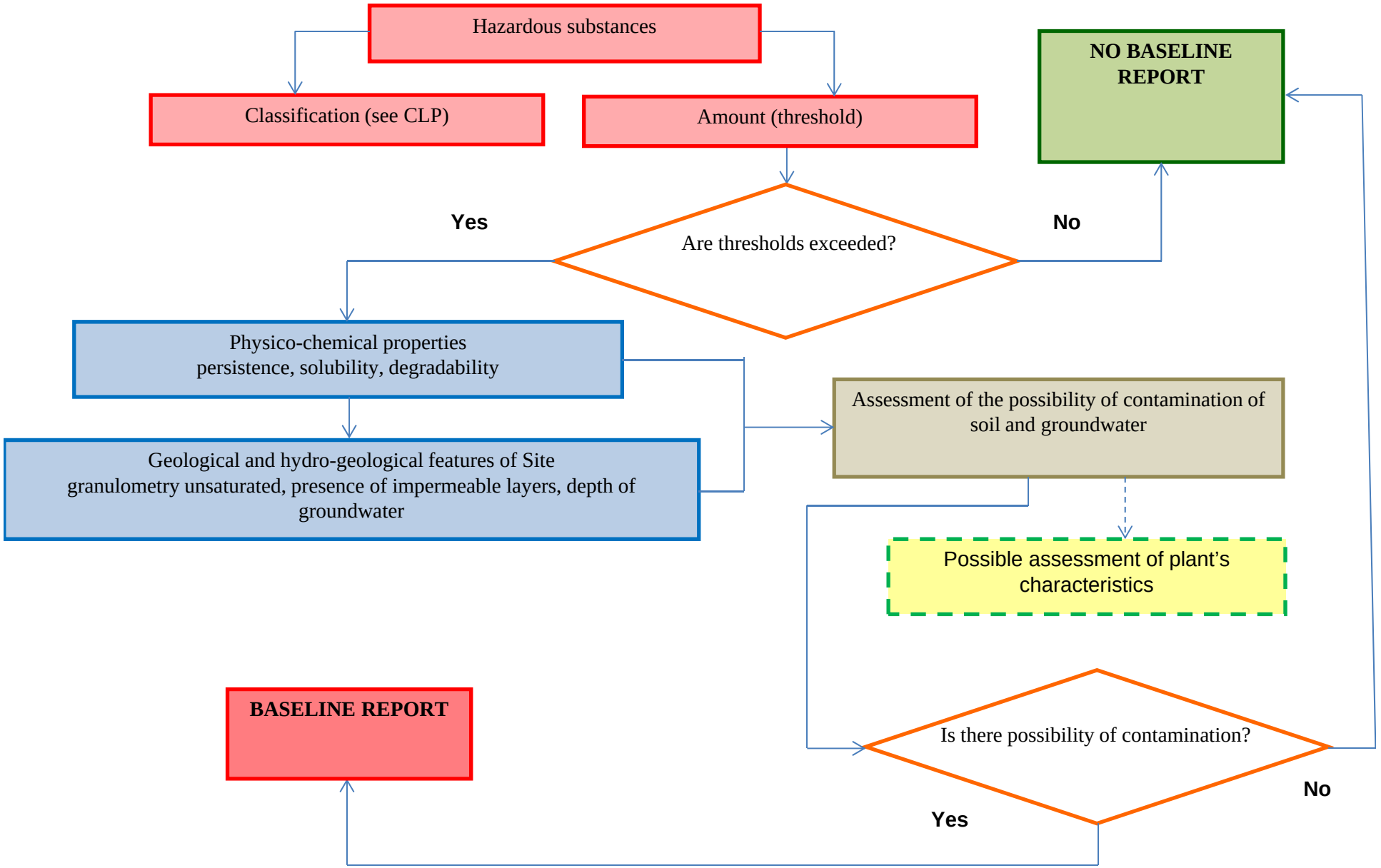
1. identification of dangerous substances produced/released/used in IPPC installation;

2. identification of their quantity,

3. evaluation of the possibility of actual contamination of soil, subsoil and groundwater, also with reference to chemical-physical characteristics of the substances, their use/storage procedures and existing available safety aids.

Only if contamination risk is present, it is therefore necessary to collect analytical data, proving the presence or absence of contamination and the related levels found.
These phases are developed through a series of evaluations and considerations structured through the use of specific algorithms and analytical data, both operational and territorial, that allow a first summary of the issues most environmentally significant, if any.
The following Figure 1 shows the Scheme of evaluation with the algorithm for processing of the steps listed above:

3. The 'Baseline Report' (4)



3. The 'Baseline Report' (5)

A) ASSESSMENT IN ORDINARY MANAGEMENT

1° level

Do the environmental protection principles used during transfer, storage and use and the operating modes ensure protection of the soil and underground water?

Yes

NO RISK OF CONTAMINATION IN ORDINARY MANAGEMENT

No

2° level

Does the geological setting on site guarantee the protection of soil and groundwater?

Yes

No

THERE MAY BE A RISK OF CONTAMINATION

3. The 'Baseline Report' (6)

B) ASSESSMENT IN EXTRAORDINARY MANAGEMENT (INCIDENTAL)

1° level

Do the environmental protection principles used during transfer, storage and use and the operating modes ensure protection of the soil and underground water?

Yes

No

NO RISK OF CONTAMINATION IN EXTRAORDINARY MANAGEMENT

2° level

Does the geological setting on the site guarantee the protection of soil and groundwater?

Yes

No

THERE MAY BE A RISK OF CONTAMINATION

3. The 'Baseline Report' (7)

Pertinent Dangerous Substances – substances or mixtures defined by art. 3 of Rule (CE) n. 1272/2008 for classification, labelling and packaging of substances and mixtures (rule CLP) that, for their **danger, mobility, persistence and biodegradability** (and other characteristics) could contaminate soil and groundwater and that are used, produced e/o released by IPPC installation.

Classe*	**Indicazione di pericolo** (regolamento (CE) n. 1272/2008)	**Soglia kg/anno o dm^3/anno**
1	H350, H350(i), H351, H340, H341	≥10
2	H300, H304,H310, H330, H360(d), H360(f), H361(de), H361(f), H361(fd), H400, H410, H411 R54, R55, R56, R57	≥100
3	H301,H311, H331, H370, H371, H372	≥1000
4	H302, H312, H332, H412, H413, R58	≥10000

*

1. Sostanze cancerogene e/o mutagene (accertate o sospette)
2. Sostanze letali, sostanze pericolose per la fertilità o per il feto, sostanze tossiche per l'ambiente
3. Sostanze tossiche per l'uomo
4. Sostanze pericolose per l'uomo e/o per l'ambiente

3. The ‘Baseline Report’ (8)

The procedure to evaluate if it’s necessary to prepare a ‘Baseline Report’ and, later, to develop it, can be organized in 8 phases, as the following ones:

1. Phases 1 - 3 – determine if it’s necessary to prepare a ‘Baseline Report’;

2. Phases 4 - 7 – determine how to prepare a ‘Baseline Report’;

3. Phase 8 – determine the minimum content of a ‘Baseline Report’.

If, during phases 1 - 3 it is demonstrated that the ‘Baseline Report’ is not needed, it is not necessary to pass to next steps, apart from IPPC Permits at national level, where it is mandatory.

This evaluation procedure must be written in a document together also motivations and that will be conserved by Competent Authority

3. The 'Baseline Report' (9)

Stage	Activity	Objective
1.	Identify which hazardous substances are used, produced or released at the installation and produce a list of these hazardous substances.	Determine whether or not hazardous substances are used, produced or released in view of deciding on the need to prepare and submit a baseline report.
2.	Identify which of the hazardous substances from Stage 1 are "relevant hazardous substances" (see Section 4.2). Discard those hazardous substances that are incapable of contaminating soil or groundwater. Justify and record the decisions taken to exclude certain hazardous substances.	To restrict further consideration to only the **relevant** hazardous substances in view of deciding on the need to prepare and submit a baseline report.

3. The 'Baseline Report' (10)

3.	For each relevant hazardous substance brought forward from Stage 2, identify the actual possibility for soil or groundwater contamination at the site of the installation, including the probability of releases and their consequences, and taking particular account of: - the quantities of each hazardous substance or groups of similar hazardous substances concerned; - how and where hazardous substances are stored, used and to be transported around the installation;- where they pose a risk to be released; - In case of existing installations also the measures that have been adopted to ensure that it is impossible in practice that contamination of soil or groundwater takes place.	To identify which of the relevant hazardous substances represent a potential pollution risk at the site based on the likelihood of releases of such substances occurring. For these substances, information must be included in the baseline report.

3. The 'Baseline Report' (11)

4.	Provide a site history. Consider available data and information: - In relation to the present use of the site, and on emissions of hazardous substances which have occurred and which may give rise to pollution. In particular, consider accidents or incidents, drips or spills from routine operations, changes in operational practice, site surfacing, changes in the hazardous substances used. - Previous uses of the site that may have resulted in the release of hazardous substances, be they the same as those used, produced or released by the existing installation, or different ones. Review of previous investigation reports may assist in compiling this data.	Identify potential sources which may have resulted in the hazardous substances identified in Stage 3 being already present on the site of the installation.

3. The 'Baseline Report' (12)

5.	Identify the site's environmental setting including: - Topography; - Geology; - Direction of groundwater flow; - Other potential migration pathways such as drains and service channels; - Environmental aspects (e.g. particular habitats, species, protected areas etc); and - Surrounding land use.	Determine where hazardous substances may go if released and where to look for them. Also identify the environmental media and receptors that are potentially at risk and where there are other activities in the area which release the same hazardous substances and may cause them to migrate onto the site.
6.	Use the results of Stages 3 to 5 to describe the site, in particular demonstrating the location, type, extent and quantity of historic pollution and potential future emissions sources noting the strata and groundwater likely to be affected by those emissions – making links between sources of emissions, the pathways by which pollution may move and the receptors likely to be affected.	Identify the location, nature and extent of existing pollution on the site and to determine which strata and groundwater might be affected by such pollution. Compare with potential future emissions to see if areas are coincident.

3. The 'Baseline Report' (13)

7.	If there is sufficient information to quantify the state of soil and groundwater pollution by relevant hazardous substances on the basis of Stages (1) to (6) then go directly to Stage 8. If insufficient information exists then intrusive investigation of the site will be required in order to gather such information. The details of such investigation should be clarified with the competent authority.	Collect additional information as necessary to allow a quantified assessment of soil and groundwater pollution by relevant hazardous substances.
8.	Produce a baseline report for the installation that quantifies the state of soil and groundwater pollution by relevant hazardous substances.	Provide a baseline report in line with the IED.

3. The 'Baseline Report' (14)

4. Conclusions (1)

Recent regulatory innovations have introduced some new tools for the production activities of IPCC installations in order to increase environmental protection through the application of new technologies, resulting both in more restrictive emissions limit values and in a greater care of the sites of IPPC installations.

Another special attention is given into new environmental aspects as well as environmental responsibility of IPPC installations' Owners/Operators in order to take into account environmental costs for preservation and restoration of environmental matrices eventually compromised by IPPC installation operation, avoiding that they could remain in charge of the Community with unfair advantages.

5. References (1)

- D.Lgs. 152/06 «*Testo unico ambientale*» e ss.mm.ii.
- Comunicazione 2014/C 136/01 «*Linee guida della Commissione europea sulle relazioni di riferimento di cui all'articolo 22, paragrafo 2, della direttiva 2010/75/UE relativa alle emissioni industriali*»
- (Linee Guida ISPRA «*Elementi propedeutici alla definizione dei criteri nazionali per l'individuazione dei contenuti tecnici della relazione di riferimento*» - Maggio 2014)
- DM 13.11.2014, n. 272 «*Decreto recante le modalità per la redazione della relazione di riferimento, di cui all'art. 5, comma 1, lettera v-bis), del decreto legislativo 3 aprile 2006, n. 152*» (GU Serie Generale n.4 del 7-1-2015)

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