

BAT LICENSING FOR POLLUTION REDUCTION: THE ITALIAN EXPERIENCE

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ABSTRACT

This paper describes new issues and opportunities in terms of pollution prevention, abatement and reduction from IED/IPPC activities by the adoption and implementation of IED/IPPC Permits released in Italy at national level following the Italian Decree n. 46 issued of March 4th, 2014, adopting European Union Commission 'Industrial Emissions Directive' (IED) issued on 2010 to require the adoption of new regulations for IPPC Permits. IED/IPPC operational permits releases started hundreds of different scenarios of best available techniques (BAT) implementation in industrial sites, where environmental pollution is now under a planned control, in order to perform a proper and adequate monitoring and data reporting activities with, if needed, also periodic environmental inspections. About 50,000 installations undertaking such industrial activities, as listed in Annex I of the IED, are required to operate in accordance with a permit (granted by Authorities of EU Member States), by means of selected prescriptions and proper provisions. Particularly, new applications of Best Available Techniques (BAT) are available in order to achieve a high level of protection of environmental matrices, as reducing pollutants industrial emissions, in term of pollutants concentrations reduction at the sources of emission and by means of new advanced monitoring and control activities. In this paper a review of the efficiency and effectiveness of environmental inspections, performed in Italy by ISPR, shows that pollution reduction is achievable by means of direct applications of BAT Conclusions – as now currently available – supplying valuable pollutants emissions limits, that represent both the respect of law limits and more effective level of environmental protection. Some data, moreover, are presented coming from more ten years of applications of these methodologies and also some results coming from some selected Case Studies are hereby represented by official diagrams and graphics.

INTRODUCTION

The implementation of IED Directive gave impulse at general improvement on environmental performance of industrial installations by taking into account the fate, transport and transformation of pollutants in environmental matrices. On this purpose, it positively contributes to the protection of the environment as a whole by considering emissions to water, air, soil as well as energy efficiency, waste production, use of raw materials as well as recovering and recycling, prevention of accidents and restoration of the site upon closure. IED Directive covers as much as about 50,000 industrial installations in EU and 5,600 in Italy.

According this approach Operators must ensure:

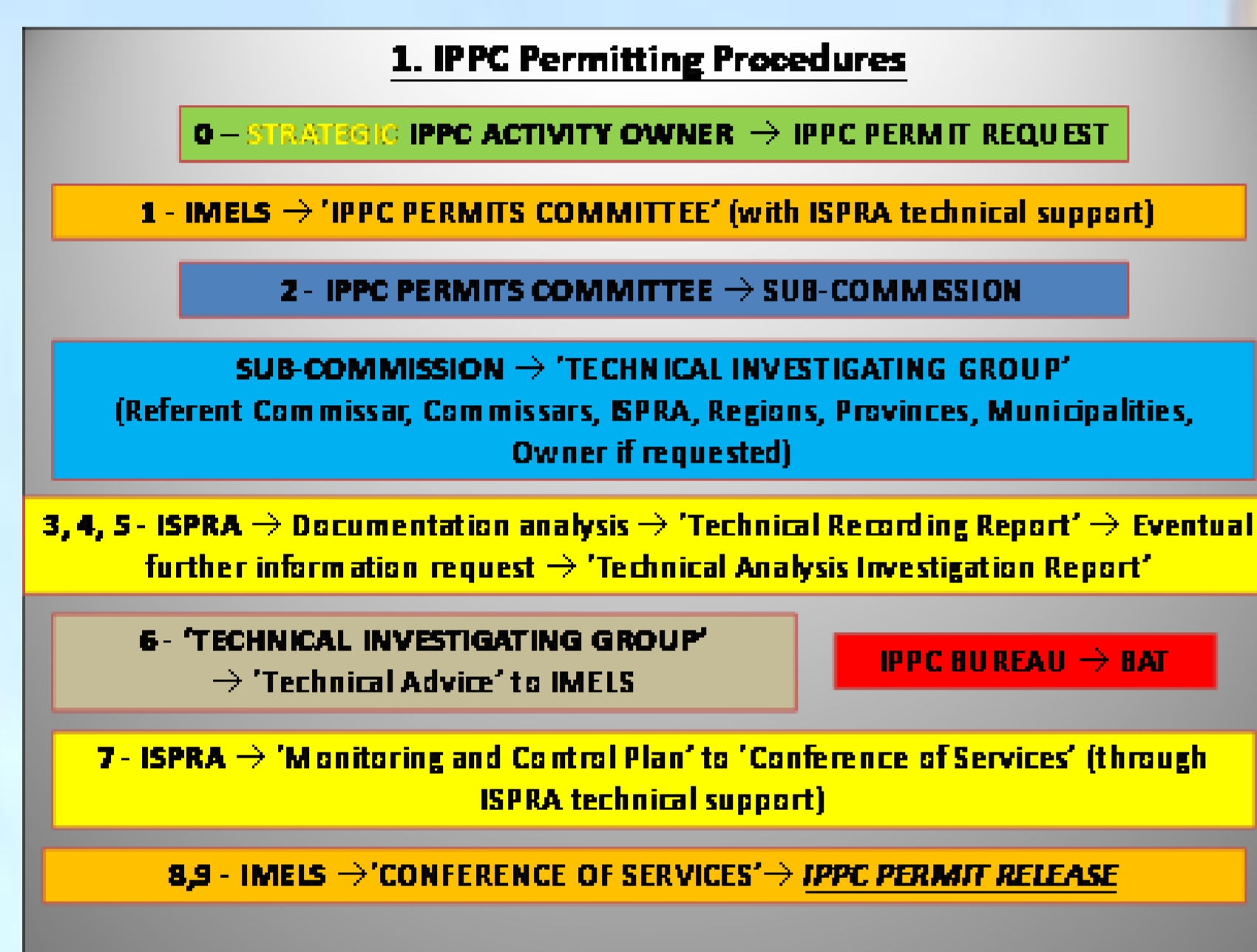
- that no significant pollution is caused,
- Best Available Techniques (BAT) are applied,
- that the "waste management hierarchy" is followed which means, in falling order, avoidance, recycling, recovery and safe disposal of waste,
- the efficient use of energy,
- accident prevention and minimization of the consequences of accidents,
- the return of the site of operation to a satisfactory state when the installation is closed.

THE ITALIAN EXPERIENCE

In Italy, IPPC Permit is one typology of integrated authorization released into the environmental protection field to achieve a high level of protection for the environment as a whole - 'integrated authorization', allowing operation of industrial activities with specified production's characteristics and dimensions, both at national level (strategic) than at regional level. IPPC Permits are released upon Operator's request in order to supply BAT for environmental pollution reduction, at the sources of emission for IED plants, adopting the scheme in the below figure.

IPPC Permits are released by the Competent Authorities as:

- by Italian Ministry for the Environment, Land and Sea (IMELS) for installations of national relevance - "strategic" activities;
- by other Authority designed by the Region or autonomous Province for other activities



The Institute for Environmental Protection and Research (ISPR) is a national public body, subject to the vigilance of the Italian Ministry for Environment, Land and Sea, endowed with administrative autonomy and together with the 21 Territorial Environmental Protection Agencies (ARPA/APPA) is part of the national network system for the protection of the environment (SNPA), established by the law n.132 of 28 June 2016.

At June 2018, a total number of about 155 IPPC licensing for installations of national relevance are operating.



The Institute for Environmental Protection and Research (ISPR) is the Italian National Control Authority for environmental inspections, monitoring and assessments, as established by the Italian Law n. 152/2006 and s.m.i. for IPPC permits' releases to IED plants of national interest, as listed in Annex XII to 2^o Part of D.Lgs n. 152/06.

As matter of a fact, a specific unit of the Institute - Environmental Inspection Unit is responsible for setting up the system of environmental inspections and drawing up National Inspection plans. The Environmental Inspection Unit is part of Division for Risks and Sustainability of Technologies, Chemicals, Production Cycles and Water Services and for Environmental Inspection Activities in Department for Environmental Assessment, Monitoring and Sustainability.

National Inspection Plan 2018 presents 117 site visit on installation with IPPC licensing of national relevance, including 4 inspections for ILVA steel plant. According to the law, a site visit take place at least every 1 to 3 years and the frequency is established using risk-based criteria, except for ILVA that is subjected to 4 inspections per year by law.

Environmental Inspection Unit performs routine inspections which include the integrated inspections (checking the compliance with all environmental provisions established by IPPC permit), follow-up inspections and non-routine inspections which are related with institutional requests.

CONCLUSIONS

As an indispensable part of the integrated permitting system, the inspection function covers not only actual integrated inspection of relevant installations, but also continuous information exchange with the Competent Authority in setting and verifying compliance with permit conditions for monitoring, recordkeeping, and reporting; approving and monitoring the implementation of an improvement programme and managing emergency situations.

The outcomes of inspections activities are necessary in order to assess the effectiveness of the inspection plan and offer also other significant elements for fulfilling high and better results in pollution abatement, giving appropriate feedback to Competent Authority.

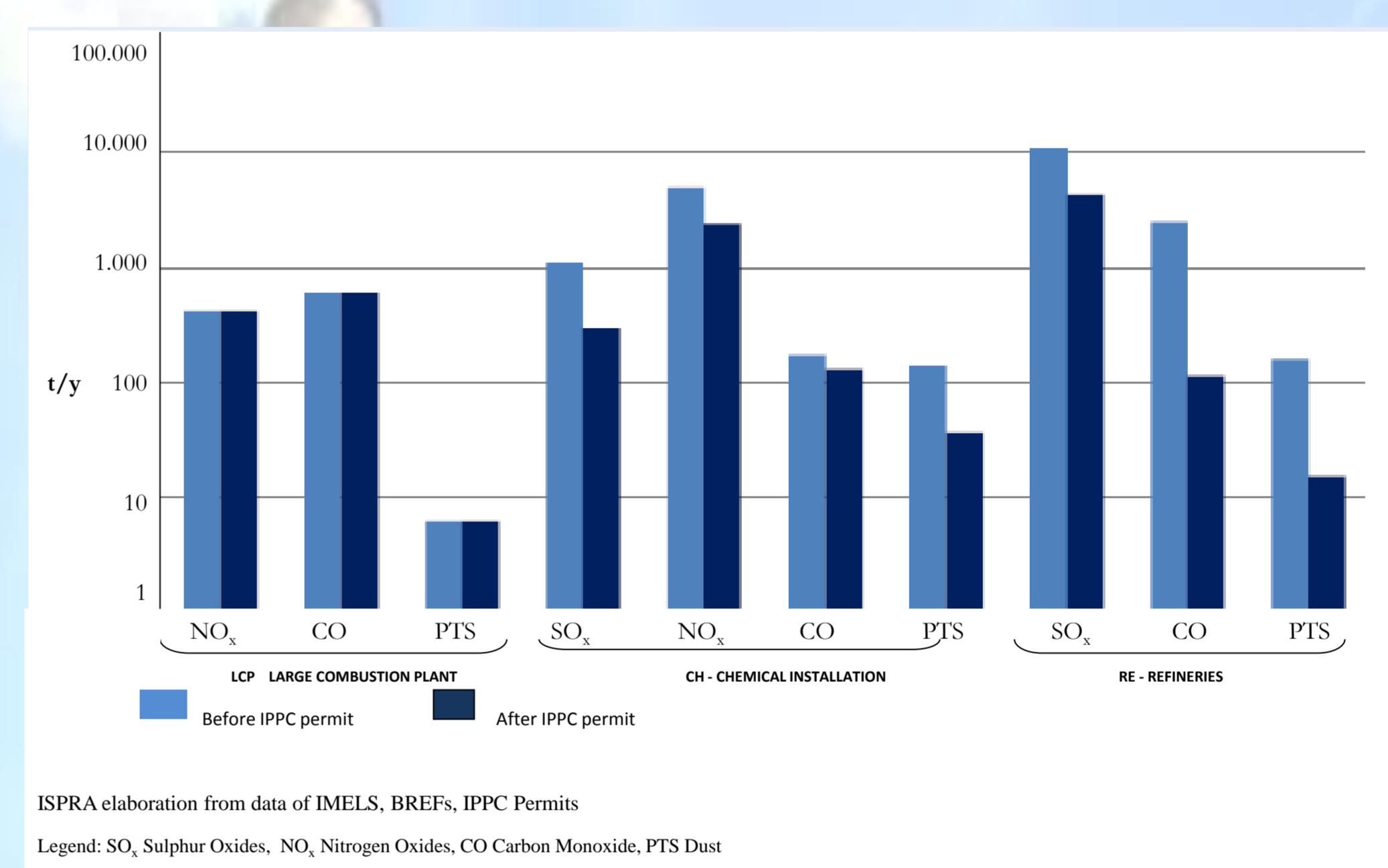
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CONTEXT ANALYSIS

Performance monitoring is necessary so the Inspecting Authority can report internally or at national or EU-level and check if objectives and targets have been met. As a matter of fact, according to the monitoring and control plan adequate information and data in terms of operational selected parameters reported to Competent Authorities, describing plant operating conditions, such as process physical and chemical parameters, e.g. temperature, pressure, air and water flow, raw material input, production capacity, inspections and control activities are performed.

In this paper we elaborate on the reduction of pollutants in chemical and petrochemical installations with IPPC permits of national relevance. According to recent data reported by ISPR, the comparison between pollutants measured before and after IPPC Permit, as reduced by BAT licensing and controlled by inspections for Large Combustion Plant - LCP; Chemical Installations - CH and Refineries - RE, of Sulphur Oxides (SO_x), Nitrogen Oxides (NO_x), Dust (PTS) and Carbon Monoxide (CO), is showed in the figure below.



These IPPC permits of refineries have most contributed to the emission reduction in air of SO_x and CO with respective quantities of 6,750 and 2,370 tons / year equal to 73% and 26%.

Chemicals installations have contributed to the abatement of NO_x and SO_x with respective quantities of 2,576 and 801 tons / year, equal to 73% and 23%.

Regard to PTS (Dust), both refineries and chemical plants contributed to this reduction with respective quantities of 142 and 103 tons / year equal to 2% and 3%.

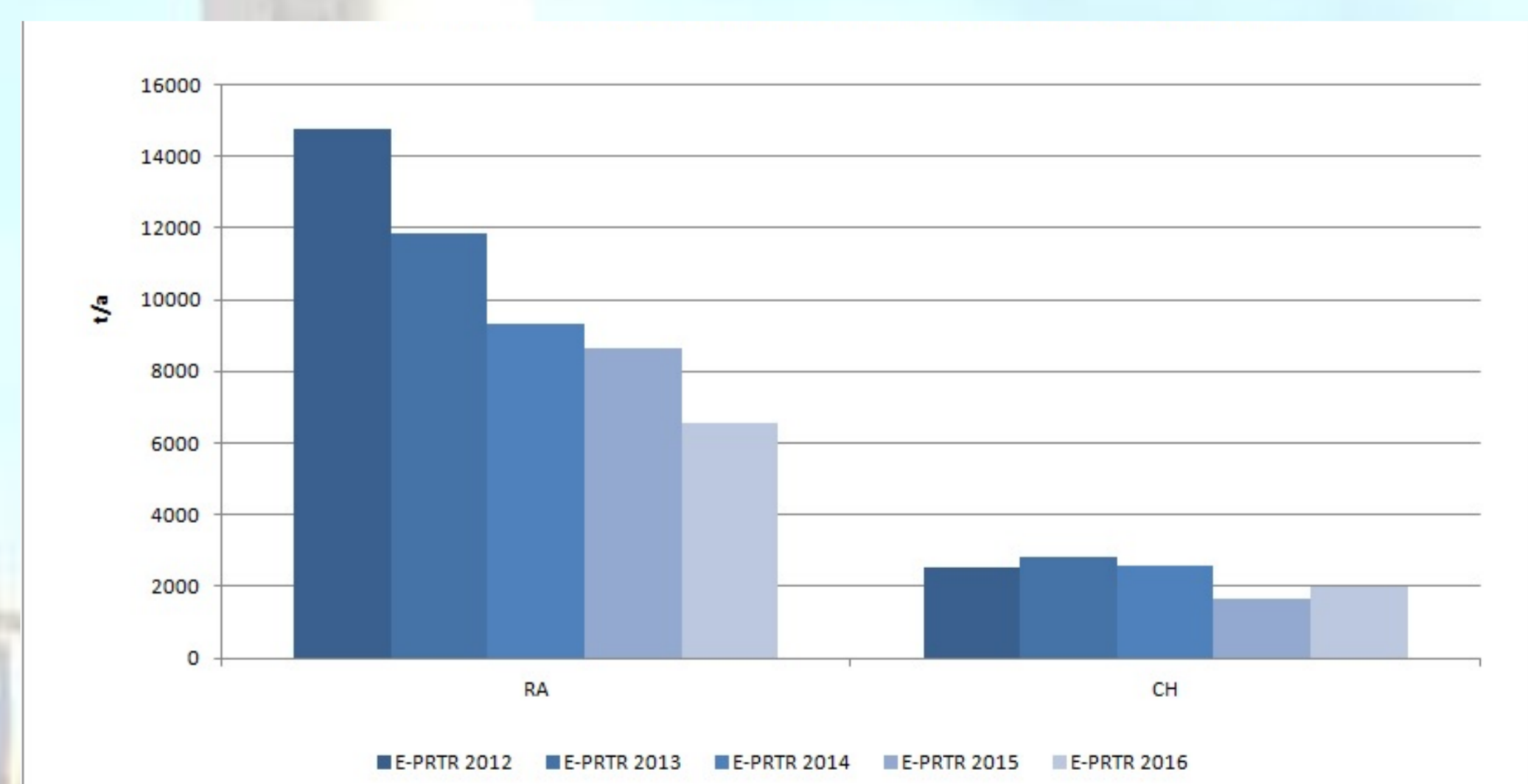
Chemical plants have contributed little to the reduction of CO emissions with a quantity equal to 43 tons / year equal to 1%.

These emission reductions of the macro-pollutants are related to 2015, for all installation categories and allowed a significant reduction in the emissions of macro pollutants into the air.

Particularly, there was a total abatement of 7,552 tons / year of SO_x equal to 59%, of 2,576 tons / year of NO_x equal to 20%, of 2,413 tons / year of CO equal to 19%, and of 245 tons / year of dust equal to 2%.

The major driver for this reduction of Italian emission is due to the implementation of BAT which introduced new technologies, plant emission limits, the limitation of Sulphur content in liquid fuels and the shift to cleaner fuels.

Similarly, the following figure show the reduction trend of NMCOV for Chemical installations - CH, Refineries - RA from 2012 to 2014.



New IPPC limits released adopting Bat-Conclusions are furtherly increasing these pollution reductions, as presenting new reduced BAT-AELs in running licensing activities, that are more developed as IPPC Permit Reviews. The following histogram resumes the permitting activities developed for Installations with national relevance in 2016, considering the following kind of IPPC Permit: NSM (Not Significant Modification); SM (Significant Modification); Fulfillment; Renewal; Review and New Permit.

