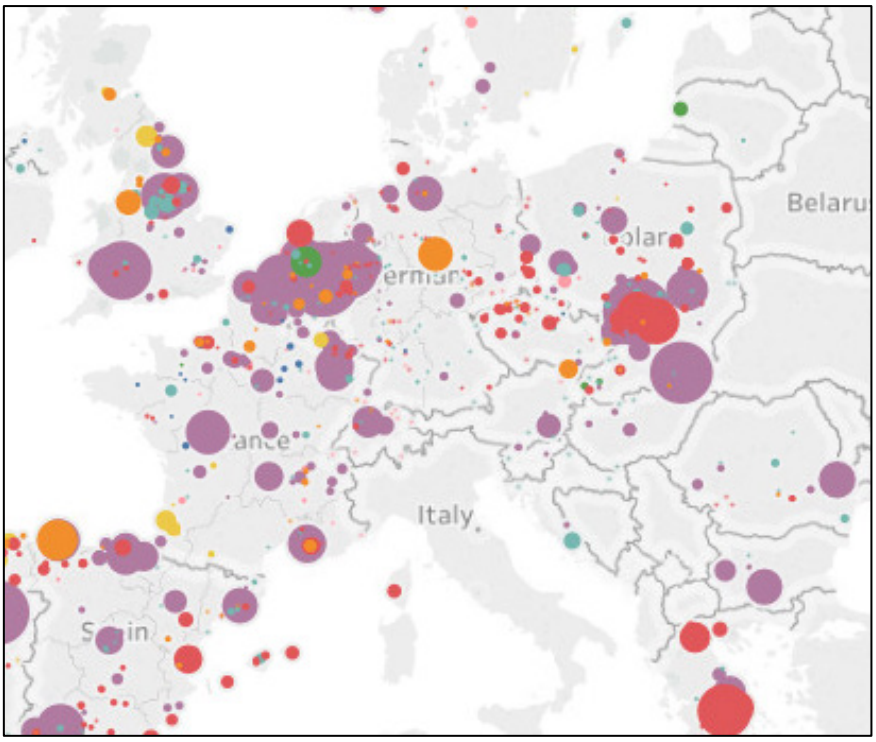
E-PRTR data review methodology



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Peter de Smet, Bernard Ullrich,
Stephan Poupa, Bastian Zeiger

European Topic Centre
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Front page picture:
Snapshot of interactive map in Tableau representing 2015 point source emissions (total annual heavy metal releases to air) as reported by countries under EC Regulation 166/2006 to the European Pollutant Release and Transfer Register (E-PRTR).

Author affiliation:
Peter de Smet: National Institue for Public Health and the Enviropnment (RIVM), NL
Bernard Ullrich, Stephan Poupa: Environment Agency Austria (UBA), AT
Bastian Zeiger: European environment Agency (EEA), DK

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ETC/ACM Technical Paper 2017/1
European Topic Centre on Air Pollution and Climate Change Mitigation
PO Box 1
3720 BA Bilthoven
The Netherlands
Phone +31 30 2748562
Fax +31 30 2744433
Email etcacm@rivm.nl
Website http://acm.eionet.europa.eu/

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BACKGROUND AND OBJECTIVE

According to Regulation (EC) No 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register[1] operators that undertake one or more activities specified in Annex I of the E-PRTR Regulation above the capacity threshold have to report their releases to air, water, land, off-site transfers of waste and of pollutants in waste water if these releases and transfers exceed the threshold values specified in Annex II of the Regulation. Member States are obliged to submit this data to the European Commission. EEA Member Countries have committed themselves to report in line with the Member States. 2007 was the first year for which data was reported. E-PRTR is an annual reporting obligation. The register includes data from the EU-28 plus Norway, Iceland, Liechtenstein, Serbia and Switzerland.

The EEA has been carrying out an annual data review of E-PRTR data since 2009. Different European topic centers have been involved in this exercise (ETC/ACM, ETC/SCP, ETC/W). The review consists of a series of checks. These checks focus on the internal consistency of the reported E-PRTR data and on verifying consistency with other reporting obligations.

In 2017 a restructuring of the review process and feedback to the countries on questionable data issues took place. It lead to more intensified and automated communication with the countries. The most urgent and relevant findings of the checks are selected and provided to countries in the form of a country-specific Excel file. Countries are expected to indicate whether or not a finding is of relevance, and how it will be addressed or if it needs to be investigated further. EEA registers and keeps track of these country responses, aiming to avoid repetitive feedback to countries on issues that have already been resolved previously.

The purpose of this methodology report is to describe the methodology of the checks used in the E-PRTR data review and the methodology for selecting/prioritizing findings for feedback to countries.

[1] Further on referred to as E-PRTR Regulation.

CHECKS OF THE E-PRTR DATA REVIEW

1. Introduction to approach

The checks aim at providing detailed feedback to countries concerning the quality of the E-PRTR data reported. The checks cover an evaluation of the number of reported facilities, the amounts of releases and transfers reported, confidentiality claims, accidental releases, etc. The checks also include a list of top polluting facilities.

The checks are predominantly performed by means of automatic checking tools but many also include a manual component such as selecting relevant findings and prioritizing or grouping of findings. The current reporting year's E-PRTR dataset is compared to the dataset of the previous reporting years.

The checks described in this report consist of two groups. One set is the automated checks installed on the Eionet CDR Repository, where countries are expected to deliver their national submission in XML formatted files to the European Commission. The set consists of the following checks on each national XML file uploaded:

C09 Mandatory database compliance validation for delivery
C10 Additional database validation
C11 Complementary Validation: National facility ID check
C12 Complementary Validation: Confidentiality and Completeness
C13 Complementary Validation: Outliers

The second set of checks consists of partially automated checking tools executed by the ETC/ACM on the full European database containing all country submissions. Results are subsequently filtered manually by experts. The final and most relevant or urgent findings are communicated through a country specific Excel file to each individual country representative (i.e. the appointed national data reporter). The file contains detailed feedback on facility level and on an aggregated national level regarding top polluters/ releases/ transfers, compared to previous years' reported data and to other national legislative data reporting flows. This group of checks consists of the following:

C03 All years cross pollutant check related to pollutant emissions @ facility level
C07 Time series consistency (multi annual) @ facility level
C16 Overview on reporting consistency
C17 Comparison reporting year Y-2 with previous year Y-3
C18 Confidential data
C20 Top releases / transfers / outliers of facilities (all years at country level & overall E-PRTR)
C21 Comparison national E-PRTR totals with National Inventories of CLRTAP/NECD and UNFCCC/ EU-MMR
C22 Comparison national activity totals with EU-ETS sector totals

In the next two chapters each individual check will be described in more detail.

2. *Automated checks on Eionet CDR repository*

Country submissions to the CDR Repository take place through uploading XML formatted files into envelopes. The automated validation checks of CDR run on these XML files following a predefined XML schema. In general an XML schema provides an easily readable description of the set of rules to which an XML document must conform in order to be considered 'valid' according to the schema constraints. It defines the XML document in terms of constraints upon what elements and attributes may appear, upon their relationship to each other and what types of data may be included.
The E-PRTR XML-file contains the complete data set to be reported for a given reporting year. The XML-file must be consistent with the E-PRTR XML schema. The current version can be found at http://www.eionet.europa.eu/schemas/eprtr. The automatic CDR checks C09, C10, C11, C12 and C13 validate the XML files uploaded by the country and are described below.

C09 Mandatory database compliance validation for delivery

Rationale of the check:

Validation of compliance for delivery:
1. XML schema validation (delivery conforms data model and XML schema)
2. Envelope Validation (delivery data correspond with envelope data)
3. Compliance validation (codes, facility reports, competent Authorities, poll. releases/transfers, waste transfers, sorted by facilities)
4. Compliance validation sorted by facilities

Original documentation on the check:

Documented in 'E-PRTR Validation Tool - User Manual, Sep2012, V3.0'; Sections 3.2.1. (& 3.1); http://www.eionet.europa.eu/schemas/eprtr/EPRTRUserManual.pdf and at the CDR Repository upload envelopes at the national sub-collection 'E-PRTR data reporting (Art. 7)'.

Checking rules:

Purpose: This validation is meant to help the country to evaluate if all mandatory data is correct. The validation detects missing or incorrect mandatory data by analysing the reported values using different methods.

This check consists of an extended set of rules with sub-rules:

1. XML Schema validation
XML Schema validation is done separately and if the result contains any errors, then data delivery is not accepted by CDR.

2. Envelope Validation
Envelope check will be performed after uploading the delivery to the CDR.

3. Compliance Validation

Deviation from any of the compliance rules described in this section will be considered as errors and will prevent data from being stored in the E-PRTR database. For a given report the following must apply:

- A facility must not be reported twice, i.e. the national identification must be unique.
- All facilities must have at least one activity.
- All facilities must have exactly one activity with Ranking = 1 (the main activity).
- An activity must not be reported twice for the same facility.
- The ranking of activities must be unique within a facility.
- A pollutant must not be reported twice for the same medium and facility.
- For releases the total quantity must be greater or equal than the accidental quantity as the accidental quantity is contained in the total quantity.
- If confidentiality is claimed for releases and transfers of pollutants the pollutant group (e.g. heavy metals) must be reported instead of the individual pollutant (e.g. Pb). This means that only pollutant codes corresponding to a pollutant group are allowed when claiming confidentiality. If confidentiality is not claimed, pollutant codes corresponding to pollutant groups are not allowed.
- When reporting releases and transfers of pollutants with method basis "M" or "C" at least one method for determining the quantity must be reported unless confidentiality is claimed.
- Information about the waste handler (recoverer/disposer) is only allowed to be reported for hazardous waste outside the country.
- When reporting transfers of waste with method basis "M" or "C" at least one method must be reported unless confidentiality is claimed.
- If the method type requires a designation, this must be reported. The description itself will not be validated as this would require a comprehensive list of all possible methods to be maintained.
- A competent authority must not be reported more than once (Identified by the name of the authority).
- The competent authority of a facility must be known (i.e. reported in the list of authorities).

Furthermore, since the method basis (M/C/E) should only be reported corresponding to the highest amount, it cannot be validated that the method basis matches the reported method types.

The Compliance Validation consists of a series of rules:

3.1 Validation of Codes

Purpose: This validation examines the format of the reporting year and whether any codes are not complying with the code lists.

1. The **Reporting year check** checks if the main report Reporting Year and all Facility Reports' reporting years are equal or smaller than the current year.
2. The **Code list checks** check if all corresponding field values match to code list values that are listed at http://www.eionet.europa.eu/schemas/eprtr/listOfValues. Invalid codes and number of occurrence are displayed in the results.

3.2 Validation of Facility Reports

Purpose: This validation examines several issues related to the facility report: duplicates, mandatory elements etc.

1. The **Duplicate Facility report Check** checks if more than one facility report with the same *NationalID* have been reported.
2. The **Not Listed Competent Authorities Check** checks if a Competent Authorities has been reported in all *Facility Reports* that are not listed in the *Competent Authority Party* element.
3. The **Facilities With No Activity Check** checks if there are *Facility Reports* without any *Activities*.

4. The **Missing Main Activity Check** checks if there are any *Facility Reports* without main *Activity* (Ranking =1).
5. The **Duplicate Activity Check** checks if any *Activities* exist with the same *Annex I Activity Code* in the *Facility Report*.
6. The **Duplicate Activity Ranking Check** checks if any *Activities* exist with the same Ranking in the *Facility Report*.
7. The **Mandatory Information Check** checks if any of the following mandatory field values is missing: *Parent Company Name, Facility Name, Address, Street, City, Post Code.*
8. The **Illegal Confidential Codes Check** checks if a *Confidential Code* is set to not confidential facility reports or not set to confidential facility reports.
9. The **Web Site Check** checks if facility web site URI is in correct format if entered.

3.3 Competent Authorities Validation

1. The **Duplicate Competent Authority Check** checks if more than one competent authorities with the same name have been reported.
2. The **Email Address Check** checks if the competent authority email address format is correct if entered.

3.4 Validation of Pollutant Releases

Purpose: This validation examines if data in *Pollutant Release* elements is correct.

1. The **Illegal Codes Check** checks if all *Pollutant Codes* are present in the code list. *Pollutant Group Codes* must be reported for confidential Items.
2. The **Digits Checks** check if the numeric format of the following amount fields is legal: *Total Quantity, Accidental Quantity.*
3. The **Total Quantity Check** checks if the *Total Quantity* is not smaller than the *Accidental Quantity*.
4. The **Mandatory Check** checks if a *Method Basis Code* is entered for a non-confidential *Pollutant Release*.
5. The **Missing Designation Check** checks if a *Designation* is entered for the required non-confidential methods.
6. The **Illegal Method Type Check** checks if any *Pollutant Release* has been reported with the *Method Type Code "WEIGH".*
7. The **Duplicate Check** checks if any duplicate *Pollutant Release* exists (same *Pollutant Code* and *Medium Code*).
8. The **Confidential Pollutant Check** checks if a confidential pollutant release is entered without *Confidential Code* or incorrect *Confidential Code,* or if a *Pollutant Release* with *Confidential Code* has no *Confidential Indicator* set.

3.5 Validation of Pollutant Transfers

All the rules in this section are similar to *Pollutant Release* validation checks.
Purpose: This validation examines if data in *Pollutant Transfer* elements is correct.

1. The **Illegal Codes Check** checks if all *Pollutant Codes* are present in the Code list. *Pollutant Group Codes* must be reported for confidential Items.
2. The **Digits Checks** check if numeric the format of *Total Quantity* is in accordance with the requirements.
3. The **Mandatory Check** checks if a *Method Basis Code* has been entered for a non-confidential *Pollutant Transfer*.
4. The **Missing Designation Check** checks if a *Designation* is entered for all required non-confidential methods.
5. The Illegal **Method Type Check** checks if any method has an incorrect *Method Type Code*.

6. The **Duplicate Check** checks if duplicate *Pollutant Transfers* exist (same P*ollutant Code* and *Medium Code*).
7. The **Confidential Pollutant Check** checks if a confidential pollutant transfer is entered without *Confidential Code* or incorrect *Confidential Code*, or if a *Pollutant Transfer* with *Confidential Code* has no *Confidential Indicator* set.

3.6 Validation of Waste Transfers
The checks (#2 - #5) are similar to the checks at 3.4 and 3.6 above.
Purpose: This validation examines if data in *Waste Transfer* elements is correct.

1. The **Waste Handler Check** checks if non-confidential *Waste Type Code* (Type=HWOC) elements exist without waste handlers, or other type elements with waste handlers.
2. The **Mandatory Check** checks if all mandatory data (*Waste Treatment Code*, *Quantity*, *Method Basis Code*, *Method Type Code, Designation*) is entered for the *Waste Type Code* transfer element and mandatory data is entered for waste handler element (*WasteHandlerParty*) if this must exist. The following fields must be filled for a Waste Handler Address and *Site* Address elements: *Street, City, Post Code, Country*.
3. The **Missing Designation Check** checks if *Designation* is entered for required not confidential methods.
4. The **Digits Checks** check if the numeric format of *Quantity* is legal.
5. The **Confidential Check** checks if a confidential waste transfer element is entered without *Confidential Code* or incorrect *Confidential Code*, or if a *Waste Transfer* with *Confidential Code* has no *Confidential Indicator* set.

4. Compliance Validation sorted by facilities
This validation performs the same checks than listed as at 2 and 3 above. The output is sorted by facilities. The rule performs the same checks as described in Compliance Check above. The results are displayed in one table and sorted by facilities.

C10 Additional database validation

Rationale of the check:

1. Are there any facilities without any releases/transfers that have been reported?
2. Are there any values below the threshold that have been reported?
3. Are there any facilities with only voluntary releases or transfers that have been reported?
4. Additional validation sorted by facilities

Original documentation on the check:

Documented in 'E-PRTR Validation Tool - User Manual, Sep2012, V3.0'; Sections 3.2.2 (& 3.1); http://www.eionet.europa.eu/schemas/eprtr/EPRTRUserManual.pdf and at the CDR Repository upload envelopes at the national sub-collection 'E-PRTR data reporting (Art. 7)'.

Checking rules:

Purpose: This validation is meant to help the country to evaluate whether the data reported are correct. The validation will not prevent data from being stored in the database.

This validation reports warnings in case of the following cases:

1. Facility reports without releases or transfers
This validation examines if any facilities without any releases/transfers have been reported.

2. Quantities below the thresholds
This validation examines if any values below the threshold have been reported.

3. Facility reports with only voluntary releases or transfers
This validation examines if any facilities with only voluntary releases or transfers (i.e. below threshold) have been reported.

4. Additional validation sorted by facilities
The validation examines the same rules as in (1), (2) and (3) but presents the results in aggregated table sorted by facilities.

It should be noted that releases/transfers below thresholds may be reported voluntarily. For pollutants, the release threshold values depend on the medium of the emission (air, land, water, waste water). For waste transfers, the threshold values depend on whether the waste is hazardous or not. For hazardous waste it should be noted that the threshold counts for the total quantity of waste per facility and whether it is treated within the country or transferred to another country.

See E-PRTR Guidance Document, 31 May 2006, http://prtr.ec.europa.eu/#/downloadguidance.

C11 Complementary Validation: National facility ID check

Rationale of the check:

The purpose of the check is to ensure the consistency of National IDs with E-PRTR Facility IDs of reported facilities over time to ensure a unequivocal identification of facilities in the E-PRTR master database. The validation rule performs different checks when a facility is reported as new or old, or not correctly reported as new or old. (**Prerequisite**: Old facilities must have a “Previous National ID” that has been actually reported in previous years (regardless the possible changes in ID). The check detects wrong “Previous National ID”s; correctly or incorrectly reported as new; duplication on IDs and/or facilities (over time)).

Original documentation on the check:

Documented in 'E-PRTR Validation Tool - User Manual, Sep2012, V3.0'; Sections 3.2.5 (& 3.1); http://www.eionet.europa.eu/schemas/eprtr/EPRTRUserManual.pdf and at the CDR Repository upload envelopes at the national sub-collection 'E-PRTR data reporting (Art. 7)’.

Checking rules:

Purpose: This validation is meant to help the country to evaluate that the data reported are correct and complete. The validation will not prevent data from being stored in the database. In particular, this validation checks the correctness of the previous national ID and reporting year reported for a given facility.

This validation has three possible outputs, including additional overview:

1. Facilities reported with wrong previous National ID
Facilities which have been reported with a combination of previous national ID and previous reporting year that cannot be found the E-PRTR database and has not been reported as 'new' (*) will be imported as new facilities onto the E-PRTR website. Please note that this will break the time series for these facilities. The following warning is shown *"Previous NationalID does not exist for the given previous reporting year."*.

2. Facilities reported as 'new facilities'
Facilities which have been found to be reported for the very first time, i.e. the facilities have been reported as 'new' (*) and the combination of the previous national ID and previous reporting year could not be found in any previous reporting (ordinary or resubmissions). These facilities will be imported as 'new' onto the E-PRTR website. The following warning is shown *"This facility is reported as 'new' and will be imported as such."*.

3. Facilities with duplicate references to previous reported facilities
Facilities which have duplicate references to a previously reported facility (only one to one links are allowed). All affected facilities will be imported as 'new' onto the E-PRTR website to allow time series to work. The following warning is shown *"This facility is referencing to a previous reported facility also referenced by other facilities in this reporting. The E-PRTR facility ID is: <parameter>"*.

4. Facilities referring to more than one facility
Facilities with a reported previous national ID and previous reporting year, that match more than one facility in the E-PRTR database (only one to one links are allowed). These facilities will be imported as 'new' onto the E-PRTR website to allow time series to work. The following warning is shown *"The previous national ID and previous reporting year match more than one facility. The matching E-PRTR facility IDs are: <parameter>"*.

(*) Facilities are considered correctly reported as 'new' if the XML contains the same year for both the current reporting year and the previous reporting year as well as identical values of the national ID and the previous national ID.

C12 Complementary Validation: Confidentiality and Completeness

Rationale of the check:

1. Is a reason provided (obligatory) for claiming confidentiality? - If confidentiality is not claimed mandatory fields have to be reported.
2. Confidentiality is claimed, but data that can be withheld due to confidentiality is still reported.
3. When confidentiality has not been claimed, is the method and method designation provided for ISO, CEN, UNECE/EMEP and IPCC standards and reference methods (obligatory)?

Original documentation on the check:

Documented in 'E-PRTR Validation Tool - User Manual, Sep2012, V3.0'; Sections 3.2.3 (& 3.1); http://www.eionet.europa.eu/schemas/eprtr/EPRTRUserManual.pdf and at the CDR Repository upload envelopes at the national sub-collection 'E-PRTR data reporting (Art. 7)'.

Checking rules:

Purpose: This validation is meant to help the country to check that the reported data are correct. The validation will not prevent data from being stored in the database.

Companies subject to reporting or competent authorities in the countries can decide to classify parts of the mandatory data as confidential. The checks examine if confidentiality has been claimed in any case and if mandatory data is reported correctly. Additionally they check which data are withheld.

The confidentiality checks have been divided into the following groups:

1. Check reporting of confidentiality reasons
This complementary validation examines if a reason is provided for claiming confidentiality. If confidentiality is not claimed mandatory fields have to be reported.

2. Information about confidentiality claims
This validation examines if confidentiality has been claimed in any case and the validation returns information about reported values that could be withheld even though confidentiality was claimed.

3. Information about confidentiality claims sorted by facilities
This validation examines if confidentiality has been claimed for any facility and signals all cases where confidentiality is claimed sorted by facilities

Prerequisites:
1. If confidentiality has been claimed, a reason has to be provided.
2. If confidentiality has not been claimed on the facility name, facility details have to be provided when feasible.
3. If confidentiality has not been claimed on releases or transfers, the method and method designation have to be provided for ISO, CEN, UNECE/EMEP and IPCC standards and reference methods.

C13 Complementary Validation: Outliers

Rationale of the check:

A reported value is indicated as a potential outlier if the value provided
1. is > 4 times the maximum value found in the previous reporting year for the same pollutant in a given sector.
2. is > 10% of the country total for the sector matching the facility and > 10,000 times the threshold for the media of the reported pollutant.
3. has increased more than 1000% (waste transfers) or 200% (air and water pollutant releases) or reduced more than 90% compared to previous year data.

Original documentation on the check:

Documented in 'E-PRTR Validation Tool - User Manual, Sep2012, V3.0'; Sections 3.2.6 (& 3.1); http://www.eionet.europa.eu/schemas/eprtr/EPRTRUserManual.pdf and at the CDR Repository upload envelopes at the national sub-collection 'E-PRTR data reporting (Art. 7)'.

Checking rules:

Purpose: The validation is meant to help the country to evaluate whether the reported data are correct. The validation will not prevent data from being stored in the database. This validation identifies potential outliers within reported quantities of air releases, water releases and waste transfers.

The check uses three different methods for detecting potential outliers:

1. Check previous years' top polluters by each sector
The reported value is indicated as potential outlier if the value provided is more than 4 times the maximum value found in previous reporting years for the same pollutant in a given sector. The following warning is shown *"The value is higher than statistically representative parameter: <parameter> "*.

2. Check reported values against country total and pollutant thresholds
The reported value is indicated as potential outlier if the value is > 10% of the country total for the sector matching the facility and > 10,000 times the threshold for the media of the reported pollutant. The country totals are calculated for each pollutant/waste type for three media 'air releases', 'water releases' and 'waste transfers'. The threshold values for the pollutants and waste and media are available at http://cdr.eionet.europa.eu/help/eprtr/listOfValues.

3. Check reported values against country data from previous year
This test is performed only if the previous year data is available on the PRTR website. The reported value is indicated as potential outlier if the value for the same NationalID is more than 10 times (waste transfers) or two times (air and water pollutant releases) higher or is more than 10 times lower compared to the previous year's data. The following warning is shown *"The value is > [1000|200]% or < 10% compared to previous year value: <previousYearValue>"*.
(The message could in be interpreted as: *The value is more than 10 | 2 times higher, or more than 10 times lower compared to previous year value: <previousYearValue>*.)

3. Partly automated checks followed by manual expert judgement and filtering

The set of checks consists of partially automated checking tools executed by the ETC/ACM on the full European public database containing all country submissions. Manual expert judgement and filtering is applied on the output of the checks. The final and most relevant issues or urgent findings that may need country clarification or correction through a resubmission are communicated through a country specific Excel file to each individual country representative (i.e. the appointed national data reporter). This file contains detailed feedback on facility level and/or a qualification or ranking in relation to national sectoral totals, top polluters/releases/transfers, compared to previous years' reported data and finally to other national legislative data reporting flows. This group consists of the checks C03, C07, C16, C17, C18, C20, C21 and C22. They are executed on the public European database and are described below.

C03 All years cross pollutant check related to pollutant emissions at facility level

Rationale of the check:

1. Are expected (air) pollutant emissions reported (e.g. for NOx, SO2, PM10, Dioxins, Hg) for facilities where an indicator pollutant (e.g. CO2, SO2) is reported for certain activities with a reliable relationship (type of pollutant, completeness and quantity) between these pollutants?
2. Which gaps can be identified in reporting of (air) pollutants at facilities where one would - based on other pollutant emissions - expect that pollutant emission?

Original documentation on the check:

Documented in 'Methodologies for identifying incomplete reporting of E-PRTR emission data with releases to air', ETC/ACM Technical Paper 2014/10 (December 2014), Chapter 4 and Annex 1; http://acm.eionet.europa.eu/reports/ETCACM_TP_2014_10_EPRTRmethodologyCPC_Incompl
(Note: the Cross Pollutant Checking tool provided can be applied on the MS Access formatted version of both national and the European database).

Checking rules:

Purpose: This cross pollutant check currently focusses on emissions to air. It detects and lists potential outliers or missing values based on emission of another pollutant, taking the EC Regulation 166/2006 Annex I activity and in some cases the main NACE code (economical sector) into account. Given a certain quantity of the reported source (i.e. indicator) pollutant there is a minimum and maximum amount of the expected resulting pollutant for a specific activity at a facility. Emissions of the resulting pollutant outside this expected range or missing values are flagged, in case they are expected to be above the reporting threshold.

In general, the emission factors used are the maximum and minimum values found for the given activity in the EMEP/EEA Guidebook (EMEP 2009) and IPCC Guidelines (IPCC 2006). In total, 174 cross pollutant relations have been integrated in this check. A complete list of the derived relations is included in the MS-Excel table "Cross_Pollutant_Check.xls" which is provided with the tool. The relationships have only been derived for releases to air and most attention has been paid to the largest sectors and the most important pollutants.
Example: Facilities with the Annex I activity 1.(c) 'Thermal power stations and other combustion installations' are expected to report releases of CO2 together with releases of NOX. Given a certain

quantity of reported CO2 (the *source* pollutant) there is a minimum and maximum amount of NOX expected (the *resulting* pollutant). The facilities with activities reporting emissions of the resulting pollutant outside this range or with missing values for the resulting pollutant are flagged. Each cross-check takes place within a year and can be applied on all reporting years, but does not check across years.

The check consists of three steps:

1. Selection of cross pollutant emissions to be checked
Emissions that can be cross-checked for each facility and its activity are selected from the E-PRTR database. Currently, cross-checks of air pollutant releases are considered, selecting source pollutant either CO2 or NOX. The following resulting pollutants are cross checked against the following source pollutants:

Source pollutant	CO2	NOX
Resulting Pollutant	AS AND COMPOUNDS CD AND COMPOUNDS CO CR AND COMPOUNDS CU AND COMPOUNDS PB AND COMPOUNDS HG AND COMPOUNDS NI AND COMPOUNDS NOX PM10 PCDD+PCDF (DIOXINS+FURANS) SOX ZN AND COMPOUNDS	CO2

2. Calculate the likely emission range of resulting pollutant
For each selected emission of the source pollutant the likely emission range of the resulting pollutant is calculated on the basis of the minimum and maximum emission factors at each activity from a look-up table. (The look-up table provides the opportunity to introduce additional conditional pollutant release criteria – not enabled currently – as refinement on current emission factors of the cross-check).

3. Flagging of potential missing data or potential outlier issues
A flag is raised when the resulting emission is missing or out of expected range, taking into account the reporting threshold and possible accidental release of the resulting pollutant.
In case the reported resulting emission value is lower than the expected minimum of the range or missing, the facility and its activity is listed and flagged with a message like *"Emission is beneath minimum"* or *"Emission is below minimum, because value is missing"*, respectively.
In case the reported emission is greater than the maximum, the facility and activity is listed and flagged with a message like *"Emission is greater than maximum"*.

4. Manual steps conducted by experts

4.1 Removal of redundant flagging
Removal of redundant flagging of bi-directional checking CO2 versus NOX at an activity in case one of both reported values is out of the expected range; not when a reporting value is missing at one of these pollutants.

4.2 Insert explicit missing data message and refining the messages

Inserting of an explicit missing data statement to the flagged finding when a reported resulting pollutant value is expected to be likely above the minimum of the expected range and above the reporting threshold, **but such value is missing**. The message "*Emission is below minimum, because value is missing*" is likely refined into "*Emission is greater than maximum" may become like "Release of <ResultingPollutant> to <ReleaseMediumCode> in <ReportingYear> is below expected range of <MinEmissionResultingPol> - <MaxEmissionResultingPol> <Units>, because no quantity is reported*"

To improve country communication in general, also the other messages are refined.

"*Emission is **beneath minimum***" becomes something like "*Release of <ResultingPollutant> to <ReleaseMediumCode> in <ReportingYear> is below expected range of <MinEmissionResultingPol> - <MaxEmissionResultingPol> <Units>, compared to cross-related source pollutant <SourcePollutant> at activity <AnnexIActivityCode>"*. For example: *"Release of SO2 to AIR in 2015 is below expected range of 5,182,904 – 140,526,160 kgm, compared to cross related source pollutant CO2 at activity 1.(c)*".

Similarly, "Emission is **greater than maximum**" may become "*Release of <ResultingPollutant> to <ReleaseMediumCode> in <ReportingYear> is above expected range of <MinEmissionResultingPol> - <MaxEmissionResultingPol> <Units>, compared to cross-related source pollutant <SourcePollutant> at activity <AnnexIActivityCode>*".

4.3 Prioritise findings

Prioritisation of findings on the basis of their *Gap*, defined as being the distance between reported resulting pollutant emission value and the minimum or maximum of the expected emission of that pollutant.

Reported resulting pollutant quantity – minimum/maximum expected resulting quantity = *Gap*

Based on the size of the gap as factor of the E-PRTR Regulation Annex II threshold value for that resulting pollutant, we defined the *Gap factor*.

Gap / E-PRTR Regulation Annex II pollutant threshold = *Gap factor*

Three classes are applied:

Priority class	**Class code**	**Gap factor interval (expert judgement)**
Low	L	$L \leq 2$
Medium	M	$2 < M \leq 10$
High	H	$H > 10$

These class intervals are based on expert judgement. The highest are considered the most urgent potential issues to report back to the country with a request to solve the issue.

Prerequisites: There are two main constraints in deriving the quantitative relations and in performing a cross pollutant check:

1. The **limited amount of available information** is a constraint in deriving the quantitative relations. The only data available are the reported emissions above reporting threshold and the activity. (Other information that would be useful in describing the relations is the type of process, the fuel type, the production or capacity and the fuel consumption and use).
2. The **reporting thresholds** limit the amount of reported emissions (compared to the total emissions) and the number of pollutants reported. In particular, smaller facilities often report only one pollutant. In that case, a cross pollutant check is impossible.

3. When a facility reports fossil CO2 as total CO2, not accounting for **biomass CO2**, then the check gives a false warning, which may occur frequently. The check cannot detect such reporting omission.

C07 Time series consistency (multi-annual) at facility level

Rationale of the check:

This check detects potential inconsistencies in the multi-annual time series (as of 2008) for any reported pollutant release by a facility and its activity into a defined medium (air), which might indicate incomplete or inconsistent quantity reporting for (a) particular year(s) compared to other years. The check is limited to facilities with larger releases being above predefined thresholds and subsequently exceeding predefined fluctuations between years.

Checking rules:

Purpose: The check aims to detect **potential inconsistencies in the multi-annual reporting** of any pollutant release quantities into a defined medium (**air**), which might indicate incomplete or inconsistent quantity reporting for particular year(s) compared to other years at specific facilities and their activities.

The check consists of two methods for detecting potential inconsistencies:

1. Minimum Threshold Multiple
The check targets only large emitters and only those facilities are checked, whose lowest reported value in the time series is above a predefined threshold (the so called ***Minimum Threshold Multiple***, MTM). This MTM is defined as the multiple of the E-PRTR Annex II pollutant threshold that the lowest reported release quantity of a pollutant has to exceed in any of the years to select the facility as candidate for inclusion in the check.

Currently, this multiple is set to MTM > 20, based on expert judgement:

Pollutant time series: Lowest reported release (MTM) > (20 ∗ Annex II pollutant threshold)

This check lists all facilities/pollutants which show gaps in reporting or high outliers. All pollutants are screened for which a threshold multiple > 20 has been reported for at least one reporting year.

2. Ratio Threshold
A ratio criterion is applied to each pollutant release time series that meets the MTM criterion. A facility is flagged, if a pollutant release ratio at the facility (expressed as maximum reported release quantity in relation to the minimum reported release quantity) exceeds a predefined threshold (the so called ***Ratio Threshold***, RT). The RT is defined as the maximum tolerated value of the ratio between highest quantity and the lowest quantity reported.

Currently, this maximum ratio is set as RT > 10, based on expert judgement:

Pollutant time series: maximum reported release / minimum reported release (=RT) > 10

Facility time series are flagged when a ratio of the maximum value/minimum value of tested pollutants > 10, or when any year in the time series of a tested pollutant is missing.

3. Additional expert judgement

3.1 New and decommissioned facilities

The check applies to the whole time series starting with the reporting year 2008. However, new facilities and decommissioned facilities do not have a full time series for air releases. In case that a facility does not report **any** air releases (but may be reporting waste transfers from follow-up decommissioning) for the latest two reporting years, it is assumed to be abandoned (or decommissioned) and reporting will not be considered incomplete for these two years. If facilities start reporting after 2008 they are considered to be new facilities and therefore the timespan before the first reporting year is not considered as a reporting gap. For 'large' facilities such as coal power plants or refineries (with CO_2 releases > 2 Mt) the closure date of the facility may be checked by additional sources available on the internet.

3.2 Eliminate less obvious and irrelevant flagging

As final step the flagged facility time series are undergoing an expert judgement at which also the appropriate observation messages are generated. This additional manual expert judgement is necessary to eliminate flagging of cases where time series inconsistencies (dips, jumps) are **less obvious**, e.g. for pollutants which have in general a higher uncertainty, such as Dioxins & Furans or heavy metals.

The expert judgement is also used to eliminate flagging of cases with incomplete time series for a specific country, activity and/or pollutant, because the country may have inserted a specific pollutant into their reporting scheme only **as of a specific date** onwards, i.e. no data exist for the whole time series. For example, a the first reporting year for a country on heavy metals emission data for power plants is 2010.

3.3 Identificy low and high outliers

Low and high outliers are also identified by expert judgement. Expert judgement is used to identify untypically large amounts of pollutants reported under a specific activity. The expert also may use trend information of other pollutants (e.g. CO_2) to identify potential outliers. Low outliers will be identified in only some rare cases, because the lowest quantity in a tested time series will always be larger than 20 times of the threshold multiple (MTM).

The flagging messages for each specific case of time series inconsistency is as follows:

- If a facility does **not report a release for a single reporting year**, the flagging message looks as the following: "*This facility reports large quantities of <pollutant code> but for <reporting year> no quantity is reported*".

  In case of **more than one reporting year is missing**, the flagging message looks like: "*This facility reports large quantities of <pollutant code> but for <reporting year1>, <reporting year2> and <reporting year3> no quantity is reported*".
  If **one or more previous reporting year is missing** then the message looks like: "*This facility reports large quantities of <pollutant code> but no quantity is reported before <reporting year>*".

- If a facility reports **large releases of a single pollutant for a single reporting year only,** the flagging message looks as the following: "*This facility reports large quantities of <pollutant code> for <reporting year> only*" or optionally "*This facility reports large quantities of <pollutant code> for <reporting year> but no other releases to air*" or optionally "*This facility reports large quantities of <pollutant code> for <reporting year> but no releases for other years*".

- If a **facility report is missing** in a specific reporting year then the flagging message looks as the following: "*This facility reports for all years except for <reporting year>*".

- If a **high outlier in time series** is detected, the flagging message looks like:
  "*This facility reports large quantities of <pollutant> for <reporting year> (high outlier)*" or optionally "*This facility reports large quantities of <pollutant code> for <reporting year> (high outlier) which are about 10x/5x higher than for other years*".

  In case an **indicator pollutant is reported in a consistent way over time series** (e.g. CO_2 or NO_X for combustion installations), but an **expected co-pollutant not**, the flagging message may be extended to:
  "*This facility reports large quantities of <indicator pollutant code> for <reporting year> (high outlier) but no <co-pollutant code> emissions*".

- If a **low outlier in time series** is detected, the flagging message looks like:
  "*This facility reports large quantities of <pollutant> until <reporting year> but only <quantity> t in reporting year (low outlier)*".

C16 Overview on reporting consistency

Rationale of the check:

This check creates an overview of the number of facilities, number of pollutant releases/transfers and number of waste transfers of current reporting year (Y-2). In a second step this overview is compared with last year's data and differences are pointed out. (In fact this is not a facility specific check; actual year = Y).

Checking rules:

Purpose: The checks aims to provide an overview of the current reporting year (Y-2) compared with the previous reporting year (Y-3) on:
1. the number of facilities reporting per country,
2. the number of facilities reporting by media (releases to air, water and land; transfers in water; waste),
3. the number of pollutant releases/ transfers by media (releases to air, water and land; transfers in water; waste), and
4. the number of reported pollutants by media.

All results are with respect to consistency and progress compared to the previous reporting year (Y-3).

Note: All methods of this check deliver comparisons between current reporting year (Y-2) and its previous reporting year (Y-3), which in fact is dealt with in check C17. However, as the main focus in C16 is on the frequency scores and as such interwoven with the basic logic of C16, i.e. checking *consistency on basis of frequencies* at reporting for a year per country, from practical point of view these comparisons are described here instead. Contrary to C16, check C17 is specific on *quantities* and their *totals* of pollutant releases/transfers, and waste transfers.

This check consists of the following separate methods to evaluate consistencies (1 and 2 on facility frequencies; 3 and 4 on pollutant frequencies):

1. Number of facilities reporting per country

This check gives an overview of the number of reporting facilities per country. The number of facilities is compared with the previous reporting year and the change in the number of facilities is calculated. Comparing the number of facilities between reporting years is an indicator of the completeness of the data reported. An evolution in the number of facilities can provide an indication of a potential progress in completeness of reporting (increase of reported facilities). Cases where the number of disappeared facilities is very high might indicate incompleteness in either the national delivery or the E-PRTR database due to irregularities in uploads or processing. Furthermore the check identifies facilities that are either only reported for one year or the other and distributes them to three groups: 1. reported for both years, 2. reported for the current reporting year (Y-2) only, or 3. reported for the previous reporting year (Y-3) only.

The change in the number of facilities is calculated as following:

Number of facilities in current reporting year (Y-2) minus Number of facilities in previous reporting year (Y-3)

2. Number of facilities reporting per media, per country

This check gives an overview of the number of facilities reporting releases to air, water, land, transfers in water and waste transfers per country.

The number of facilities is compared to the data of the previous reporting year. An evolution in facilities can provide an indication of a potential progress in completeness in reporting (increase in release reports). A decreasing number of facilities reporting per country and media can indicate missing data or incomplete reporting and should be checked by the country.

3. Number of pollutant release/transfer reports per media, per country

This check aims at providing an overview of the number of pollutant release/transfer reports by media, country and reporting year. The check compares the number of reports to the previous reporting year. A decreasing number of pollutant release/ transfer reports per media can indicate missing data or incomplete reporting and should be checked by the country.

The change in the number of reports is calculated as following:

No of release/transfer reports for a certain media in the current reporting year (Y-2) minus Number of release/transfer reports for this media in the previous reporting year (Y-3)

4. Number of pollutants reported by media

The purpose of this check is to show the number of pollutants reported by media compared to the previous reporting year. An increase in the number of pollutants reported by media could indicate more complete reporting. On the other hand, a decrease in the number of pollutants reported by media can indicate missing data or incomplete reporting and should be checked by the country.

C17 Comparison reporting year Y-2 with previous year Y-3

Rationale of the check:

Are there pollutant releases/transfers which have significant fluctuations or missing data in current reporting year Y-2 compared to its previous reporting year Y-3? (In fact this is not a facility specific check; actual year = Y).

Note: All methods of check C16 provide in fact also comparisons between data of current reporting year data (Y-2) and its previous reporting year (Y-3). However, their main focus on frequency scores is so interwoven with the basic logic of C16, i.e. checking *consistency on basis of frequencies* at reporting for a year per country, that from practical point of view these comparisons are described at C16. Contrary to C16, check C17 is specific on quantities and their totals of pollutant releases/transfers and waste transfers.

Checking rules:

Purpose: This check aims in providing:

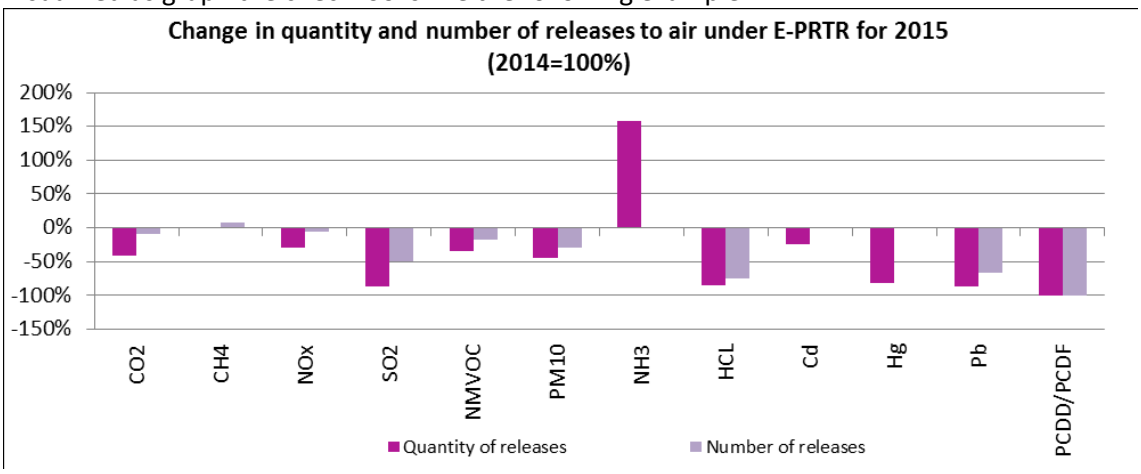
1. a comparison of quantity and number of releases to air for the current reporting year (Y-2) compared with the previous reporting year (Y-3),
2. a comparison of quantity and number of releases to water for the current reporting year (Y-2) compared with the previous reporting year (Y-3),
3. a comparison of quantity and number of releases to land for the current reporting year (Y-2) compared with the previous reporting year (Y-3),
4. a comparison of waste quantities and the number of waste transfers of the current reporting year (Y-2) compared with the previous reporting year (Y-3).

The four types provide and overview as follows:

1. Comparison of the current reporting year's quantity and number of releases to air compared to data for the previous reporting year, per country

This check identifies significant changes in country emissions for specific air pollutants compared to the previous reporting year. Significant changes indicate potential mistakes in reporting or potential outliers. Changes in the quantity or number of releases are expressed as change compared to last year's data and are therefore either positive or negative. High changes could be caused by potential outliers and should be checked by the country. Changes of minus 100% to the quantity and number of releases indicate disappearances and should also be checked by the corresponding country (see PCDD/PCDF in the example).

Visualized as graph the check looks like the following example:



2. Comparison of the current reporting year's quantity and number of releases to water compared with data for the previous reporting year, per country
This check is similar to the methodology of the check at 1. for air releases, only the media is different.

3. Comparison of the current reporting year's quantity and number of releases to air compared with data for the previous reporting year, per country
This check is similar to the methodology of the check at 1. for air releases, only the media is different.

4. Comparison of the current reporting year's waste quantities and the number of waste transfers compared with data for the previous reporting year, per country
This check is similar to the methodology of the check at 1. for air releases, only the media is different.

C18 Confidential data

Rationale of the check:

Checks for facilities and/or pollutant releases/transfers and waste transfers in the current reporting year (Y-2) that have confidential flags per country and per activity. Also checks whether valid reasons for claiming confidentiality at facilities with confidential data were provided?

Note: This check C18 is similar to Eionet CDR check C12, except that it is now applied on the overall European E-PRTR data set instead of the individual national CDR envelope containing a (re)submission of a data set for one year.

Checking rules:

Purpose: This check provides for the current reporting year (Y-2) on both national and European level:

1. an overview on the number of facilities reporting confidential data,
2. a list of facilities reporting confidential data including reasons for confidentiality, and
3. a list of facilities reporting confidential releases/transfers including quantities.

The three types of overviews are as follows:

1. Number of facilities reporting confidential data

This check provides an overview of the number of facilities reporting confidential data per country, per European group of countries and per activity for the current reporting year (Y-2). Confidential data is evaluated at four different levels: *(i)* the level of the facility report, *(ii)* the pollutant release report, *(iii)* the pollutant transfer report and *(iv)* the waste transfer report.

This general check does not include information about which specific data entry has been kept confidential. In case a significant number of confidential data entries are found for a specific country, further investigation concerning which information has been held confidential can be carried out in a second step.

The output pivot table of this check looks as following:

Country	X			
Sum of facilities				ReportingYear
Sector	Activity	MainActivity	ReportType	Year Y-2
2	2.(c)	2.(c).(i)	Pollutant Release	5
	2.(d)	2.(d)	Facility Report	1
			Waste Transfer	3
	2.(e)	2.(e).(ii)	Facility Report	1
			Pollutant Release	
			Waste Transfer	3

The field *ReportType* refers to the four levels at which confidentiality can be claimed: facility report, pollutants release report, pollutant transfer report or waste transfer report. Under the heading *ReportingYear* the number of facilities reporting confidential data in current reporting year Y-2 is given.

Prerequisite: The pivot table has limitations in so far as the aggregate number of facilities reporting confidential data cannot be calculated by sector, activity or main activity level since this would lead to double counting of facilities with various confidential data entries.

2. List of facilities reporting confidential data including reasons for confidentiality

This check provides a full list of facilities for which confidentiality is claimed, including the reasons for claiming confidentiality. The list indicates to which group of data the confidentiality claim relates: the facility report, the pollutant release report, the pollutant transfer report or the waste transfer report.

The output pivot table of this check looks as following:

Reporting Year	Year							
Country	X							
Sector	Activity	MainActivity	FacilityID	NationalID	Facility name	Reason	ReportType	Number
1	1.(c)	1.(c)				4(2)(b)	Pollutant Release	1
						4(2)(b)	Pollutant Transfer	1
						4(2)(a)	Waste Transfer	1
						4(2)(b)	Facility report	2

The reasons for confidentiality refer to Article 4(2) Directive 2003/4/EC (See Annex I of this paper) on public access to environmental information and repealing and can be looked up directly in the Directive[2]. The field R*eportType* refers to the four levels at which confidentiality can be claimed: facility report, pollutants release report, pollutant transfer report or waste transfer report. The *Number* indicates how many elements have been marked as confidential for the specific report type and for a specific reason of confidentiality.

Prerequisite: The list does not include the exact data element under these four *ReportType* groups to which confidentiality applies because this information is very heterogeneous and thus cannot be processed automatically.

3. List of facilities reporting confidential releases/transfers including quantities

This check provides a list of facilities with the pollutant group and quantity of confidential pollutant releases/transfers in case the pollutant has been kept confidential. This test only looks at confidentiality at the level of the pollutant release/transfer report and not at the level of facility or waste transfer report.

The output pivot table of this check looks as following:

Reporting Year	Year
Country	x

Sector	Activity	MainActivity	FacilityID	NationalID	Facility name	Reason	Medium	PollutantGroup	Pollutant	Quantity in kg/a
1	1.(c)	1.(c)				4(2)(b)	Air	Other gases	Other gases (confident	x
						4(2)(b)	Water	Other gases	Other gases (confident	y
						4(2)(b)	Air	Greenhouse gases	Greenhouse gases (con	z
								Other gases	Other gases (confident	x

In the filter on top of the table the reporting year and the country can be selected. Only the countries that have reported confidential data at the level of the pollutant/transfer release can be selected.

The reasons for confidentiality refer to Article 4(2) Directive 2003/4/EC on public access to environmental information and repealing and can be looked up directly in the Directive. The test covers the media air, water and transfer in water. Waste transfers are not covered. The *Quantity in kg/a* indicates the reported quantity in kg/a that has been reported as confidential for this facility, confidentiality reason, medium and pollutant group.

C20 Top releases/transfers/outliers of facilities (all years at country level & overall E-PRTR)

Rationale of the check:

This check creates a list of top 5 (top 10 for NO_x, SO_x and waste transfers) facilities for specific pollutants releases/transfers and waste transfers for each medium at overall E-PRTR level for the current reporting year (Y-2). Furthermore a list of facilities with an E-PRTR share above 90% for a specific pollutant for the current reporting year (Y-2) is generated. In a last step high potential outliers throughout the time series are identified.

[2] Directive 2003/4/EC: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1492696168478&uri=CELEX:32003L0087

Checking rules:

Purpose: This check provides overviews for the current reporting year (Y-2) on:
1. Top polluting facilities and potential outliers on overall European E-PRTR level.
2. Facilities with an E-PRTR share above 90% for a specific pollutant.
3. High potential outliers identified throughout the timeseries.

The three types of overviews are as follows:

1. Top polluting facilities and potential outliers on overall European E-PRTR level

Facilities ranked among the European top polluting facilities are the biggest contributers to the emissions for the specific pollutant they are ranked for. Therefore, it is recommended to check the reported values and if possible clarify them. The ranking system also indicates if the facility was within those top polluters in the previous year, or not. Always being ranked under the top polluting facilities for a specific pollutant could indicate that the values are correct and the facility is indeed responsible for those high emissions.

The *National Share* is calculated as:

A facility's release/transfer quantity in kg/a for a pollutant, medium, activity and reporting year / Total national release/transfer quantity in k/a for a pollutant, medium, activity and reporting year

The *All countries share* is calculated as:

A facility's release/transfer quantity in kg/a for a pollutant, medium, activity and reporting year / Total E-PRTR facilities' release/transfer quantity in k/a for a pollutant, medium, activity and reporting year

The *Threshold multiple* is calculated as:

A facilities release/transfer quantity in kg/a for a pollutant, medium, activity and reporting year / The Annex II threshold for the respective pollutant

The check distinguishes between the waste types hazardous (within country (HWIC) and transboundary (HWOC)) and non-hazardous wastes (NON-HW) and between waste treatment options (recovery (R), disposal (D)).

The *National share* is calculated as:

A facility's quantity of waste transfers in t/a for a **specific** waste type, treatment type, activity and reporting year / Total quantity of a country's (national) waste transfers in t/a for **all** waste and treatment types, per activity and reporting year

The A*ll countries share* is calculated as:

A facility's quantity of waste transfers in kg/a for a **specific** waste type, treatment type, activity and reporting year / Total E-PRTR quantity of waste transfers in kg/a for a **specific** waste type, treatment type, activity and reporting year

The schematic messages for findings look as follows:
"Top5/ Top10 - E-PRTR share is 69.2% and the country share is 99.5%. Rank 2015 (2014): 1 (-). This facility either didn't report this pollutant in the previous year or the value reported was significantly lower. This could indicate reporting mistakes or potential outliers. Quantity 2014: -"
Explanation: In this case the facility corresponding to this message is ranked first compared to all facilities also reporting this pollutant for 2015. For 2014 the facility is not ranked within the top polluters, since it has not been reported for 2014 as can been seen (dash) at the end of the finding schematic *"Quantity 2014: -"*. This could indicate an error in reporting or a potential outlier for the year 2015.

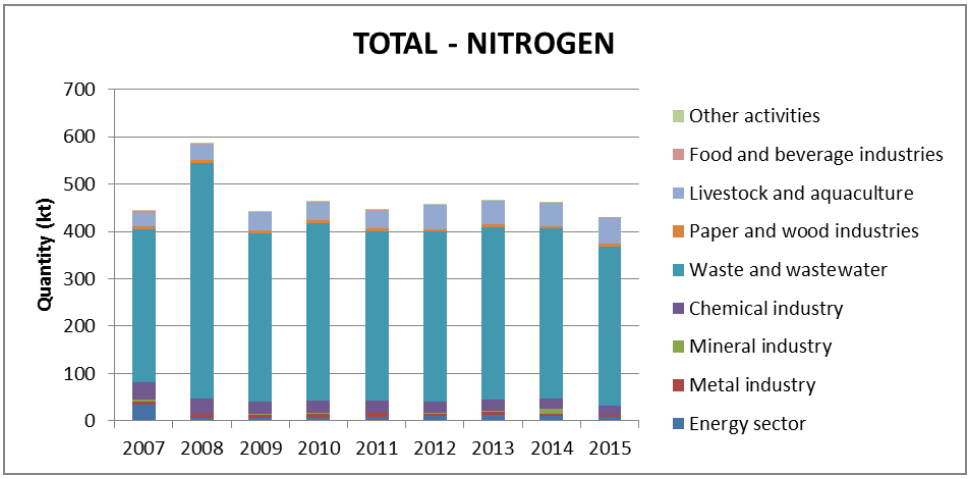
"Top5/ Top10 - E-PRTR share is 17.0% and the country share is 17.2%. Rank 2015 (2014): 2 (3). This facility either didn't report this pollutant in the previous year or the value reported was significantly lower. This could indicate reporting mistakes or potential outliers. Quantity 2014: 19 900"

2. Facilities with an E-PRTR share above 90% for a specific pollutant
All pollutant releases reported by facilities are filtered to create a list with facilities that have a share of more than 90% of the E-PRTR total. Shares this high are a possible indicator for reporting mistakes and potential outliers and should be checked by the corresponding country. For information on the calculation methods for the *National share*, *All countries share* and the *Threshold multiple* see C20.1.

The schematic message for findings looks as follows:
"Above 90% - E-PRTR share is 98.36% and the country share is 100%. Quantity 2014: 42.4"

3. High potential outliers identified in the time series
Time series graphs and pivot tables for all pollutants to all media are used to identify high potential outliers throughout the time series. High quantities compared to the previous year and its successive earlier years could be an indication on reporting mistakes (for example unit errors) and potential outliers.

Example of a time series graph:



The example shows the total emissions of all countries for total nitrogen emissions to water. The higher bar for the "waste and waste water management" sector in 2008 indicates potential outliers. As a next step the pivot tables containing all releases to all media are used to identify potential outliers. If the comparison of values reported for previous and successive years reinforces the assumption that the facility could be an outlier the facility is added to the list of findings.

The schematic messages for findings look as follows:
"The waste quantity reported for this facility in 2014 is significantly higher than in 2015. This could indicate reporting mistakes or potential outliers. Quantity 2015: 351 000"

"The quantity of Zn and compounds reported for this facility in 2014 is significantly higher than in 2015. This could indicate reporting mistakes or potential outliers. Quantity 2015: 84 100"

C21 Comparison national E-PRTR totals of air emissions with National Inventories of CLRTAP/NECD and UNFCCC/ EU-MMR

Rationale of the check:

Cross-checks national total E-PRTR facility level air emissions with national and category total air emissions reported under CLRTAP (on air pollutants)/UNFCCC (on Greenhouse Gases). (This is in fact not a facility specific check).

Checking rules:

Purpose: The purpose of this check is to put the data reported under E-PRTR into context compared to other reporting obligations and to explain possible differences between reporting obligations. Releases to **air** reported under E-PRTR are compared with emissions reported by Parties/Member States under CLRTAP/NECD and under UNFCCC/EU-MMR.

Direct comparison of these emissions is difficult because the structure of reported data under E-PRTR and both Conventions differs significantly. However, one basic checks can be performed:

1. Comparison of E-PRTR air emissions reported per aggregated activity with (aggregated) sectoral emissions reported under CLRTAP and UNFCCC (APs, PM10, POPs, HMs, CO2, CH4, N2O, F-gases).

Note: The CLRTAP emissions of EEA member countries are provided by EEA; the emissions reported under EU reporting obligations as well.

The comparison on air emissions is as follows:

The E-PRTR reporting obligation is restricted by criteria on minimum thresholds for facility capacity and pollutant emissions. This leads to lower national totals than those of the other inventories. Therefore, the total E-PRTR facility level emissions should never exceed the national total emission reported under CLRTAP or UNFCCC. The main objective of this comparison is to highlight inconsistency of reporting (if occurring). Identified inconsistencies should be checked by the corresponding country.

National data used for comparison is taken from (or is consistent with):

Greenhouse gases	National emissions reported to the UNFCCC and to the EU Greenhouse Gas Monitoring Mechanism • Location of submissions by Parties: http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/10116.php • Dataset used for comparison: http://www.eea.europa.eu/ds_resolveuid/DAT-13-en (EEA permalink to latest version)
Air pollutants	National emissions reported to the Convention on Long-range Transboundary Air Pollution (LRTAP Convention) • Location of submissions by Parties http://www.ceip.at/overview-of-submissions-under-clrtap/ • Dataset used for comparison: http://www.eea.europa.eu/ds_resolveuid/DAT-16-en (EEA permalink to latest version)

Values where total E-PRTR releases are greater than CLRTAP or UNFCCC national totals are highlighted red. If a pollutant is not reported under CLRTAP then the difference becomes a negative value and is highlighted too.

The result of the check is a pivot table and looks as follows:

ReportingYear	2015					
Country	Czech Republic					
		Values				
Pollutant	Unit	Number of Facilities	EPRTR total Emissions	CLRTAP/UNFCCC National Total Emissions	Share EPRTR on National Total [%]	Difference (National Total-EPRTR)
Ammonia (NH3)	Gg	213	6.05	67.62	8.94%	61.57
Arsenic and compounds (as As)	Mg	16	1.56	0.96	162.16%	-0.60
Cadmium and compounds (as Cd)	Mg	13	0.36	0.49	72.88%	0.13
Carbon monoxide (CO)	Gg	13	131.09	155.61	84.24%	24.52
Chromium and compounds (as Cr)	Mg	3	0.89	5.85	15.21%	4.96
Copper and compounds (as Cu)	Mg	3	1.37	4.27	32.21%	2.89
Lead and compounds (as Pb)	Mg	13	11.89	11.06	107.49%	-0.83
Mercury and compounds (as Hg)	Mg	36	1.99	2.01	99.02%	0.02
Nickel and compounds (as Ni)	Mg	10	4.19	4.43	94.59%	0.24
Nitrogen oxides (NOx/NO2)	Gg	79	71.89	80.29	89.54%	8.40
Non-methane volatile organic cor	Gg	11	2.90	89.75	3.23%	86.86
Particulate matter (PM10)	Gg	16	2.78	17.75	15.64%	14.97
PCDD + PCDF (dioxins + furans) (as	g	11	14.21	21.68	65.57%	7.46
Polychlorinated biphenyls (PCBs)	kg	1	0.12	1.49	8.23%	1.37
Polycyclic aromatic hydrocarbons	Mg	2	0.37	0.34	109.99%	-0.03
Sulphur oxides (SOx/SO2)	Gg	70	98.40	101.91	96.55%	3.52
Zinc and compounds (as Zn)	Mg	7	6.96	30.29	22.98%	23.33

Note: The reporting of CO_2 air emissions under E-PRTR does not follow the IPCC Guidelines but includes also CO_2 from biomass. For certain countries which have a high biomass consumption (e.g. Sweden) this could be a reason for indicated inconsistencies between the E-PRTR data and the UNFCCC/EU-MMR data.

C22 Comparison of E-PRTR national totals with totals of EU-ETS (CO2)

Rationale of the check:

Cross-checks national activity/sector CO2 totals (including biomass CO2 fraction) reported under E-PRTR with EU-ETS sector totals for CO2. (This is in fact not a facility specific check).

Checking rules:

Purpose: The main objective of this check is verifying the consistency of reporting on CO2 emissions and highlight differences and/or identify installations/facilities which are potentially missing under either E-PRTR or EU-ETS reporting.

The EU emission trading scheme (ETS) is regulated by Directive 2003/87/EC. Activities and gases covered by the EU-ETS are listed in Annex I of the directive (and Annex I of this report). Some constraints apply to the comparisons. Not all facilities covered by the E-PRTR reporting are included in the EU-ETS and the unit for which the data are reported differs (facility for E-PRTR and installation for EU-ETS).

For the comparisons the data contained in the EEA's "EU-ETS data viewer"[3] (which provides verified CO_2 emissions by Member States) is used.

Coverage: Since the reporting year 2008, the EU-ETS covers installations in EU-28 plus Norway, Liechtenstein and Iceland.

Emissions included: From 2008 onwards, also N_2O emissions of nitric acid production may be included in the scheme. In 2009, the Netherlands and Norway included such installations and in 2010, Austria included one installation. Emissions are reported as CO_2 equivalents, this means that it is not possible to distinguish whether an installation emitted CO_2 or N_2O or both.

Explanation of differences between the E-PRTR activities and the EU-ETS sectors
E-PRTR contains emissions on *facility* level (which can consist of a number of *installations* that can be covered by different E-PRTR *activities*), whereas the EU-ETS contains information on the level of installations.

In addition, the coverage of the specific activities under EU-ETS and E-PRTR is different:

- 1.c versus 1: E-PRTR activity 1.c covers thermal power stations and other combustion installations with a heat input of 50 MW or higher / EU-ETS sector 1 covers combustion installations with a rated thermal input exceeding 20 MW and does not include hazardous or municipal waste incineration plants.
- 1.a versus 2: E-PRTR activity 1.a covers mineral oil and gas refineries / EU-ETS sector 2 covers mineral oil refineries.
- 3.c versus 6: E-PRTR activity 3.c covers installations for the production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day, or lime in rotary kilns with a production capacity exceeding 50 tonnes per day, or cement clinker or lime in other furnaces with a production capacity exceeding 50 tonnes per day / EU-ETS sector 6 covers production of cement clinker or lime (no capacity threshold).
- 3.e versus 7: E-PRTR activity 3.e covers installations for the manufacture of glass, including glass fibre with a melting capacity of 20 tonnes per day / EU-ETS sector 7 covers installations for the manufacture of glass, including glass fibre (no capacity threshold).
- 3.g versus 8: E-PRTR activity 3.g covers installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain with a production capacity of 75 tonnes per day, or with a kiln capacity of 4 m^3 and with a setting density per kiln of 300 kg/m^3 / EU-ETS sector 8 covers installations for the manufacture of ceramic products by firing (no capacity threshold).
- 6.a and 6.b versus 9: E-PRTR activity 6.a covers Industrial plants for the production of pulp from timber or similar fibrous materials with any capacity, and E-PRTR activity 6.b covers Industrial plants for the production of paper and board and other primary wood products (such as chipboard, fibreboard and plywood) with a production capacity of 20 tonnes / EU-ETS sector 9 covers installations for the production of pulp, paper and board (no capacity threshold).

The result of the check is a table which looks like following example:

Country	Unit	Total EPRTR	EPRTR Facilities		ETS verified emissions	ETS Installations	R-PRTR Share on ETS
Austria	Gg	29 408.0	46		28 055.97	198	105%
Belgium	Gg	43 284.0	65		43 853.14	335	99%

[3] EU-ETS data viewer: http://www.eea.europa.eu/ds_resolveuid/BKCDQV3W1Y (EEA permalink to latest version)

ANNEX I - DIRECTIVE 2003/87/EC – ANNEX I

Directive 2003/87/EC

Annex I

CATEGORIES OF ACTIVITIES REFERRED TO IN ARTICLES 2(1), 3, 4, 14(1), 28 AND 30

1. Installations or parts of installations used for research, development and testing of new products and processes are not covered by this Directive.

2. The threshold values given below generally refer to production capacities or outputs. Where one operator carries out several activities falling under the same subheading in the same installation or on the same site, the capacities of such activities are added together.

Activities	**Greenhouse gases**
Energy activities	
Combustion installations with a rated thermal input exceeding 20 MW (except hazardous or municipal waste installations)	Carbon dioxide
Mineral oil refineries	Carbon dioxide
Coke ovens	Carbon dioxide
Production and processing of ferrous metals	
Metal ore (including sulphide ore) roasting or sintering installations	Carbon dioxide
Installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2.5 tonnes per hour	Carbon dioxide
Mineral industry	
Installations for the production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or lime in rotary kilns with a production capacity exceeding 50 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day	Carbon dioxide
Installations for the manufacture of glass including glass fibre with a melting capacity exceeding 20 tonnes per day	Carbon dioxide
Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain, with a production capacity exceeding 75 tonnes per day, and/or with a kiln capacity exceeding 4 m3 and with a setting density per kiln exceeding 300 kg/m^3	Carbon dioxide
Other activities	
Industrial plants for the production of:	Carbon dioxide
(a) pulp from timber or other fibrous materials	Carbon dioxide
(b) paper and board with a production capacity exceeding 20 tonnes per day	Carbon dioxide

ANNEX II - MAPPING OF E-PRTR AND CLRTAP/CRF CATEGORIES

E-PRTR activities for which additional comparisons are possible have been aggregated under sector A-D2 as in the following table:

E-PRTR Annex I Activity mapping	
A	**Energy/manufacturing industries and waste incineration**
	1.(a) Mineral oil and gas refineries
	1.(b) Installations for gasification and liquefaction
	1.(c) Thermal power stations and other combustion installations
	1.(d) Coke ovens
	1.(e) Coal rolling mills
	1.(f) Installations for the manufacture of coal products and solid smokeless fuel
	2.(a) Metal ore (including sulphide ore) roasting or sintering installations
	2.(b) Installations for the production of pig iron or steel (primary or secondary melting) including continuous casting
	2.(c) Installations for the processing of ferrous metals
	2.(c).(i) - Hot-rolling mills
	2.(c).(ii) - Smitheries with hammers
	2.(c).(iii) - Application of protective fused metal coats
	2.(d) Ferrous metal foundries
	2.(e) Installations:
	2.(e).(i) - For the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes
	2.(e).(ii) - For the smelting, including the alloying, of non-ferrous metals, including recovered products (refining, foundry casting, etc.)
	2.(f) Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process
	3.(c) Installations for the production of:
	3.(c).(i) - Cement clinker in rotary kilns
	3.(c).(ii) - Lime in rotary kilns
	3.(c).(iii) - Cement clinker or lime in other furnaces
	3.(d) Installations for the production of asbestos and the manufacture of asbestos-based products
	3.(e) Installations for the manufacture of glass, including glass fibre
	3.(f) Installations for melting mineral substances, including the production of mineral fibres
	3.(g) Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain
	4.(a) Chemical installations for the production on an industrial scale of basic organic chemicals, such as:
	4.(a).(i) - Simple hydrocarbons (linear or cyclic, saturated or unsaturated, aliphatic or aromatic)
	4.(a).(ii) - Oxygen-containing hydrocarbons
	4.(a).(iii) - Sulphurous hydrocarbons
	4.(a).(iv) - Nitrogenous hydrocarbons

E-PRTR Annex I Activity mapping	
	4.(a).(ix) - Phosphorus-containing hydrocarbons
	4.(a).(v) - Halogenic hydrocarbons
	4.(a).(vi) - Organometallic compounds
	4.(a).(vii) - Basic plastic materials (polymers, synthetic fibres and cellulose-based fibres)
	4.(a).(viii) - Synthetic rubbers
	4.(a).(x) - Dyes and pigments
	4.(a).(xi) - Surface-active agents and surfactants
	4.(b) Chemical installations for the production on an industrial scale of basic inorganic chemicals, such as:
	4.(b).(i) - Gases
	4.(b).(ii) - Acids
	4.(b).(iii) - Bases
	4.(b).(iv) - Salts
	4.(b).(v) - Non-metals, metal oxides or other inorganic compounds
	4.(c) Chemical installations for the production on an industrial scale of phosphorous-, nitrogen- or potassium-based fertilisers (simple or compound fertilisers)
	4.(d) Chemical installations for the production on an industrial scale of basic plant health products and of biocides
	4.(e) Installations using a chemical or biological process for the production on an industrial scale of basic pharmaceutical products
	4.(f) Installations for the production on an industrial scale of explosives and pyrotechnic products
	5.(a) Installations for the recovery or disposal of hazardous waste
	5.(b) Installations for the incineration of non-hazardous waste in the scope of Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste
	5.(e) Installations for the disposal or recycling of animal carcasses and animal waste
	6.(a) Industrial plants for the production of pulp from timber or similar fibrous materials
	6.(b) Industrial plants for the production of paper and board and other primary wood products
	6.(c) Industrial plants for the preservation of wood and wood products with chemicals
	8.(a) Slaughterhouses
	8.(b) Treatment and processing intended for the production of food and beverage products from:
	8.(b).(i) - Animal raw materials (other than milk)
	8.(b).(ii) - Vegetable raw materials
	8.(c) Treatment and processing of milk
	9.(a) Plants for the pre-treatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles
	9.(b) Plants for the tanning of hides and skins
	9.(c) Installations for the surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating
	9.(d) Installations for the production of carbon (hard-burnt coal) or electro-graphite by means of incineration or graphitisation
	9.(e) Installations for the building of, and painting or removal of paint from ships
B	**Fugitive emissions from mining**

E-PRTR Annex I Activity mapping	
	3.(a) Underground mining and related operations
	3.(b) Opencast mining and quarrying
C	**Agriculture (poultry, pigs)**
	7.(a) Installations for the intensive rearing of poultry or pigs
	7.(a).(i) - With 40 000 places for poultry
	7.(a).(ii) - With 2 000 places for production pigs (over 30kg)
	7.(a).(iii) - With 750 places for sows
D1	**Landfills/waste disposal**
	5.(c) Installations for the disposal of non-hazardous waste
	5.(d) Landfills (see note in Guidance Document)
D2	**Waste water treatment**
	5.(f) Urban waste-water treatment plants
	5.(g) Independently operated industrial waste-water treatment plants which serve one or more activities of this annex

CLRTAP sectors for which additional comparisons are possible have been aggregated under sector A-D2 as in the following table:

CLRTAP (NFR 08) mapping	
A	**Energy/manufacturing industries and waste incineration**
	1 A 1 a Public Electricity and Heat Production
	1 A 1 b Petroleum refining
	1 A 1 c Manufacture of Solid Fuels and Other Energy Industries
	1 A 2 a Stationary Combustion in Manufacturing Industries and Construction: Iron and Steel
	1 A 2 b Stationary Combustion in Manufacturing Industries and Construction: Non-ferrous Metals
	1 A 2 c Stationary Combustion in Manufacturing Industries and Construction: Chemicals
	1 A 2 d Stationary Combustion in Manufacturing Industries and Construction: Pulp, Paper and Print
	1 A 2 e Stationary Combustion in Manufacturing Industries and Construction: Food Processing, Beverages and Tobacco
	1 A 2 f i Stationary Combustion in Manufacturing Industries and Construction: Other (Please specify in your IIR)
	1 A 3 e Pipeline compressors
	1 B 1 a Fugitive emission from Solid Fuels: Coal Mining and Handling
	1 B 1 b Fugitive emission from Solid Fuels:Solid fuel transformation
	1 B 1 c Other fugitive emissions from solid fuels
	1 B 2 a i Exploration Production, Transport
	1 B 2 a iv Refining / Storage
	1 B 2 a v Distribution of oil products
	1 B 2 a vi Geothermal energy extraction
	1 B 2 b Natural gas
	1 B 2 c Venting and flaring

CLRTAP (NFR 08) mapping	
	2 A 1 Cement Production
	2 A 2 Lime Production
	2 A 3 Limestone and Dolomite Use
	2 A 4 Soda Ash Production and use
	2 A 5 Asphalt Roofing
	2 A 6 Road Paving with Asphalt
	2 A 7 a Quarrying and mining of minerals other than coal
	2 A 7 b Construction and demolition
	2A 7 c Storage, handling and transport of mineral products
	2 A 7 d Other Mineral products (Please specify the sources included/excluded in the notes column to the right)
	2 B 1 Ammonia Production
	2 B 2 Nitric Acid Production
	2 B 3 Adipic Acid Production
	2 B 4 Carbide Production
	2 B 5 a Other chemical industry (Please specify the sources included/excluded in the notes column to the right)
	2 B 5 b Storage, handling and transport of chemical products (Please specify the sources included/excluded in the notes column to the right)
	2 C 1 Iron and Steel Production
	2 C 2 Ferroalloys Production
	2 C 3 Aluminum Production
	1 Copper Production
	2 C 5 b Lead Production
	2 C 5 c Nickel Production
	2 C 5 d Zinc Production
	2 C 5 e Other metal production (Please specify the sources included/excluded in the notes column to the right)
	2 C 5 f Storage, handling and transport of metal products (Please specify the sources included/excluded in the notes column to the right)
	2 D 1 Pulp and Paper
	2 D 2 Food and Drink
	2 D 3 Wood processing
	2 E Production of POPs
	2 F Consumption of POPs and Heavy Metals (e.g. electricial and scientific equipment)
	2 G Other production, consumption, storage, transportation or handling of bulk products (Please specify the sources included/excluded in the notes column to the right)
	3 A 1 Decorative coating application
	3 A 2 Industrial coating application
	3 A 3 Other coating application (Please specify the sources included/excluded in the notes column to the right)
	3 B 1 Degreasing

CLRTAP (NFR 08) mapping	
	3 B 2 Dry cleaning
	3 C Chemical products
	3 D 1 Printing
	3 D 2 Domestic solvent use including fungicides
	3 D 3 Other product use
	6 C a Clinical Waste Incineration (d)
	6 C b Industrial Waste Incineration (d)
	6 C c Municipal Waste Incineration (d)
	6 C d Cremation
	6 C e Small Scale Waste Burning
B	**Fugitive emissions from mining**
	1 B 1 a Fugitive emission from Solid Fuels: Coal Mining and Handling
	2 A 7 a Quarrying and mining of minerals other than coal
	2A 7 c Storage, handling and transport of mineral products
	2 A 7 d Other Mineral products (Please specify the sources included/excluded in the notes column to the right)
C	**Agriculture (poultry, pigs)**
	4 B 8 Swine
	4 B 9 a Laying Hens
	4 B 9 b Broilers
	4 B 9 c Turkeys
	4 B 9 d Other Poultry
D1	**Landfills/waste disposal**
	6 A SOLID WASTE DISPOSAL ON LAND
D2	**Waste water treatment**
	6 B WASTE-WATER HANDLING

The CRF sectors for which additional comparisons are possible have been aggregated under sector A-D2 as in the following table:

UNFCCC (CRF) mapping	
A	**Energy/manufacturing industries and waste incineration**
	1.A.1 Energy Industries
	1.A.2 Manufacturing Industries and Construction
	1.A.3.E Other Transportation (please specify)
	1.B Fugitive Emissions from Fuels
	2 Industrial Processes
	3 Solvent and Other Product Use
	6.C Waste Incineration
B	**Fugitive emissions from mining**
	1.B.1.A Coal Mining and Handling

UNFCCC (CRF) mapping	
C	**Agriculture (poultry, pigs)**
	4.B Manure Management
D1	**Landfills/waste disposal**
	6.A Solid Waste Disposal on Land
D2	**Waste water treatment**
	6.B Wastewater Handling

TERMINOLOGY

Here are the definitions of some of the terms that are frequently used in the initial checks and this methodology report:

- *Country*:
  Refers to the respective country reporting under E-PRTR (EU 28 + Norway, Island, Liechtenstein, Switzerland, Serbia)
- *Medium*:
  The medium refers to the environmental medium in which pollutants are releases or to which pollutants are transferred. The media covered under E-PRTR are air, water and land.
- *Pollutant*:
  Pollutant according to Annex II of the E-PRTR Regulation No 166/2006/EC. In the context of the review work, pollutant can also refer to a pollutant group in those cases where a facility has claimed confidentiality on a pollutant level. Instead of reporting the released or transferred amount of a specific pollutant, the amount will be reported on the pollutant group level (as in accordance with the E-PRTR Guidance document).
- *Sector:*
  Refers to the main E-PRTR sectors listed in Annex I of the E-PRTR Regulation No 166/2006/EC, e.g. 4 Chemical industry.
- *Activity:*
  Refers to the E-PRTR activities listed in Annex I of the E-PRTR Regulation No 166/2006/EC, e.g. 4(a) Chemical industry. The coding consists of a number in combination with a letter. Operators that undertake one or more Annex I activities above the applicable capacity thresholds specified therein have to report their releases and off-site transfers under E-PRTR. All Annex I activities carried out at a facility have to be reported and ranked according to the economic activity (or in order of pollution).
- *Sub-activity:*
  The E-PRTR activities have to be reported at the level of the activity. For a number of activities, a further subdivisions is included in Annex I of the E-PRTR Regulation No 166/2006/EC. The coding for the sub-activities consists of the activity code in combination with a roman number. Reporting of the sub-activity is voluntary.
- *MainActivity:*
  Refers to the activity that the operator determines as the main activity of a facility. The main activity can be determined at activity or sub-activity level, e.g. 4 (a) or 4(a)(i). In accordance with the E-PRTR guidance document, the main activity refers to the main economic activity of the facility or if the main economic activity is not representative of the processes undertaken at the facility.
- *National ID*:
  Refers to the unique national ID that the country has assigned to the respective facility in its national system.
- *Facility ID:*
  Refers to the unique ID assigned to the facility in the E-PRTR database.
- *Facility:*
  One or more installations on the same site that are operated by the same natural or legal person (Article 2 of E-PRTR Regulation).

- *Installation:*
  Stationary technical unit where one or more activities listed in Annex I are carried out, and any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution (Article 2 of E-PRTR Regulation).
- *Pollutant release/transfer report*
  Release or transfer reported for a specific pollutant by a specific facility in a specific year. For example facility X reports in 2007 releases to air for CO_2, SO_2 NO_x and Cd. This means that it reports four pollutants, which equals four release reports for facility X in 2007.
- *Reporting year*
  The year for which E-PRTR data (transfers and releases) have been reported.

UNITS AND ABBREVIATIONS

kg ..... 1 kilogram = 10^3 g (gram)
t..... 1 tonne (metric) = 1 megagram (Mg) = 10^6 g
Mg..... 1 megagram = 10^6 g = 1 tonne (t)
Gg ..... 1 gigagram = 10^9 g = 1 kilotonne (kt)
Tg ..... 1 teragram = 10^{12} g = 1 megatonne (Mt)
TJ..... 1 terajoule

As ..... arsenic
Cd..... cadmium
CDR ..... central data repository of EEA's Eionet Reportnet
CEIP..... EMEP Centre on Emission Inventories and Projections
CH_4 ..... methane
CLRTAP..... LRTAP Convention
CO ..... carbon monoxide
CO_2 ..... carbon dioxide
Cr ..... chromium
CRF..... UNFCCC common reporting format for greenhouse gases
Cu..... copper
EEA..... European Environment Agency
EFTA..... European Fair Trade Association
Eionet ..... European Environment Information and Observation Network
EPER..... European Pollutant Emission Register
EMEP..... Co-operative programme for monitoring and evaluation of the long-range transmissions of air pollutants in Europe
E-PRTR ..... European Pollutant Release and Transfer Register
ETC/ACM ..... European Topic Centre on Air Pollution and Climate Change Mitigation
EU ..... European Union
EU-ETS ..... EU Emission Trading System
EU-MMR ..... EU Monitoring Mechanism
F-gases..... Fluorinated gases
GHG ..... greenhouse gas
HWIC..... hazardous waste (transferred) inside the country
HWOC..... hazardous waste (transferred) outside the country (transboundary waste movement)
Hg..... mercury
HMs ..... heavy metals
IOWWTP ..... Independently operated waste water treatment plant
LRTAP Convention ..... UNECE Convention on Long-range Transboundary Air Pollution
MTM ..... Minimum Threshold Multiple
N_2O ..... nitrous oxide

NACE ..... Nomenclature statistique des activités économiques dans la Communauté européenne - Nomenclature of economic activities
NECD ..... National Emission Ceilings Directive (2001/81/EC)
NFR ..... UNECE nomenclature for reporting of air pollutants
NH_3 ..... ammonia
NON-HW ..... non hazardous waste
Ni ..... nickel
NMVOCs ..... non-methane volatile organic compounds
No ..... number
NO_2 ..... nitrogen dioxide
NO_x ..... nitrogen oxides
Pb ..... lead
PCDD ..... polychlorinated dibenzodioxins (PCDDs) - dioxines
PCDF ..... polychlorinated dibenzofurans (PCDF) - furans
PM ..... particulate matter
PM_{10} ..... particles measuring 10 µm or less
$PM_{2.5}$ ..... particles measuring 2.5 µm or less
POPs ..... persistent organic pollutants
PRT ..... pollutant release and transfer (release into air, water, land and transfer in water)
PR ..... pollutant release
PT ..... polutant transfer
RT ..... Ratio Threshold
SO_2 ..... sulphur dioxide
SO_x ..... sulphur oxides
UNECE ..... United Nations Economic Commission for Europe
UNFCCC ..... United Nations Framework Convention on Climate Change
WT ..... waste transfer
..... number of

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Directive 2003/87/EC of the European Parliament and of the council of 13 Oct 2003 establishing a scheme for GHG allowance trading within Community and amending Council Directive 96/61/EC. (Refer to Annex I of this paper). (http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1492696168478&uri=CELEX:32003L0087)

EEA, EU-ETS data viewer, EU Emissions Trading System (ETS) data viewer. (Permalink to latest version http://www.eea.europa.eu/ds_resolveuid/BKCDQV3W1Y)

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