Experience with Industrial Emissions Reporting and QA/QC in Norway

Presentation on Training Seminar on QA/QC procedures in Industrial Processes

Riga, May 2015

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Norway, Basic Information

- 5,1 million inhabitants
- 385 000 km^2
- Large oil and gas producer
- Large raw material producer (Aluminium, ferro alloys, fertilizer, pulp and paper)
- Large fish exporter
- Not EU member, but has cooperation agreement with EU (EEA-agreement)

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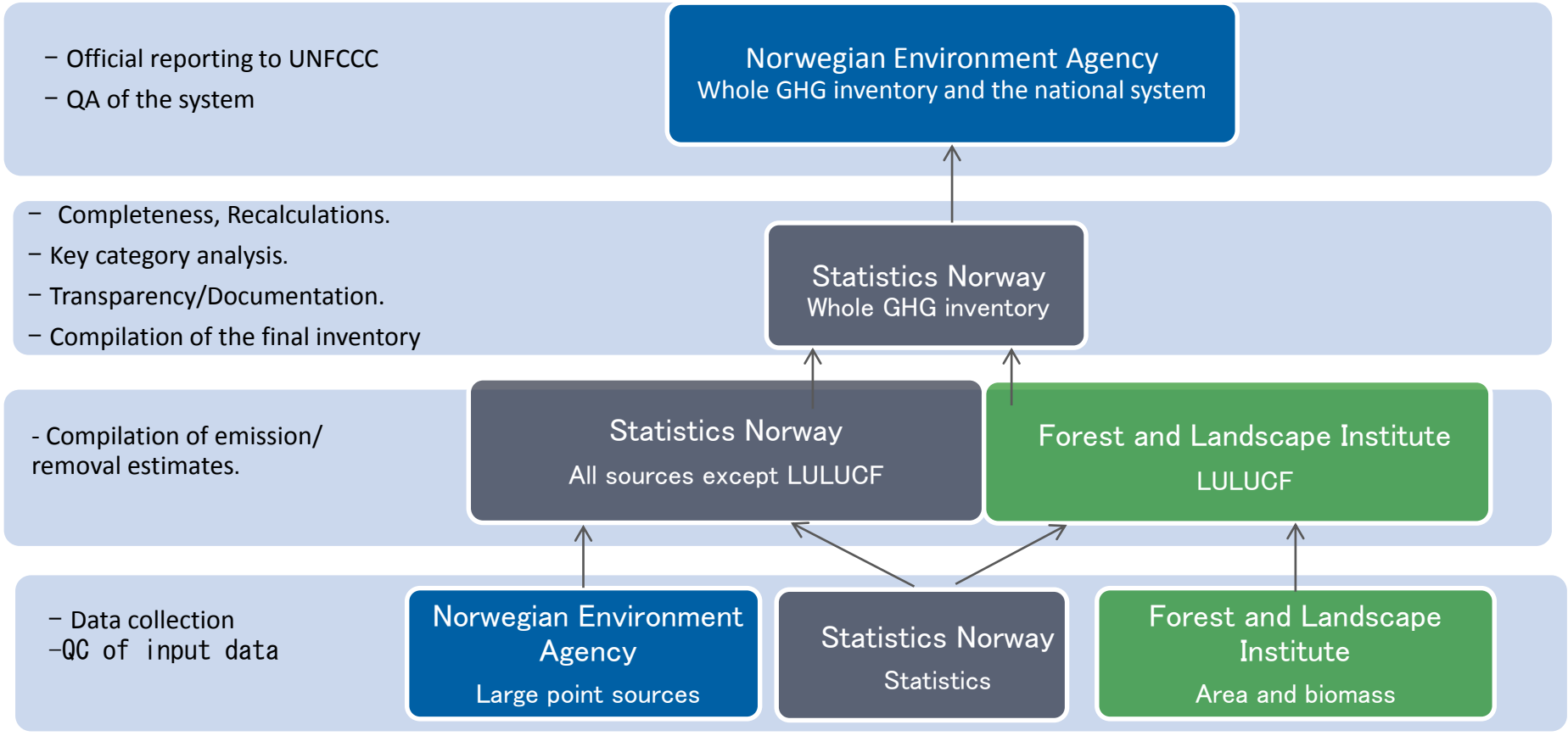
The National system – responsible institutions



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Our GHG inventory - a system in continuous development

Development since the 1980s:

- CO2 → CH4, N2O → Fluorinated Gases
- Most sectors and few data sources → All sectors and many data sources
- Increased use of bottom-up calculations of emissions from point sources
- National methodology → IPCC methodology
- IPCC default emission factors → specific emission factors
- Every year: Improvement of parts of methodology, emission factors and activity data
- Extended documentation

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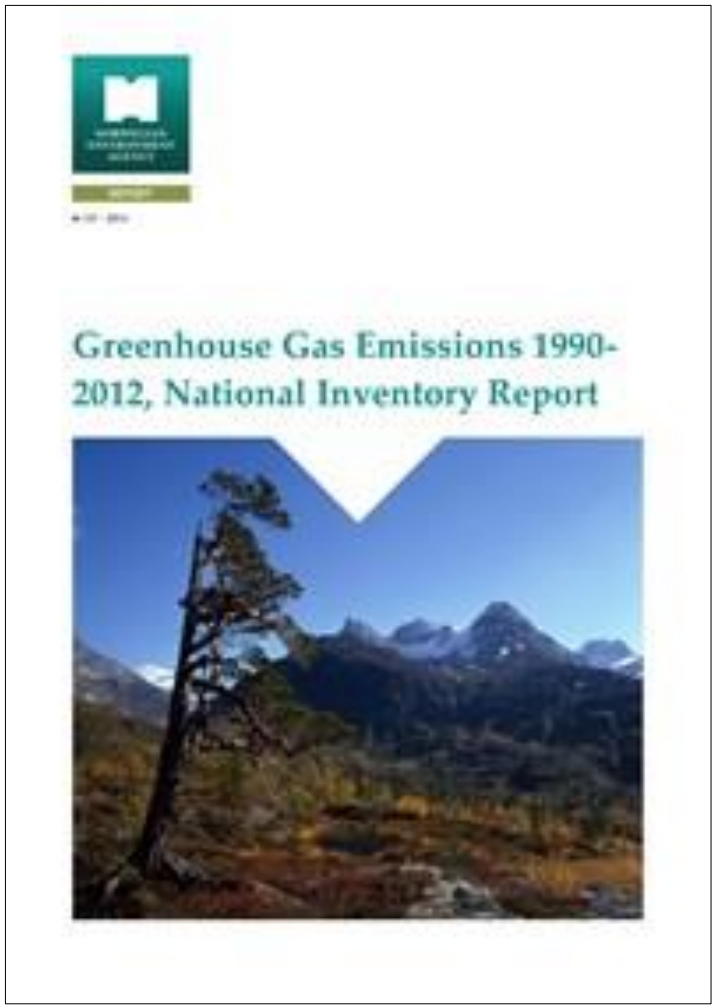
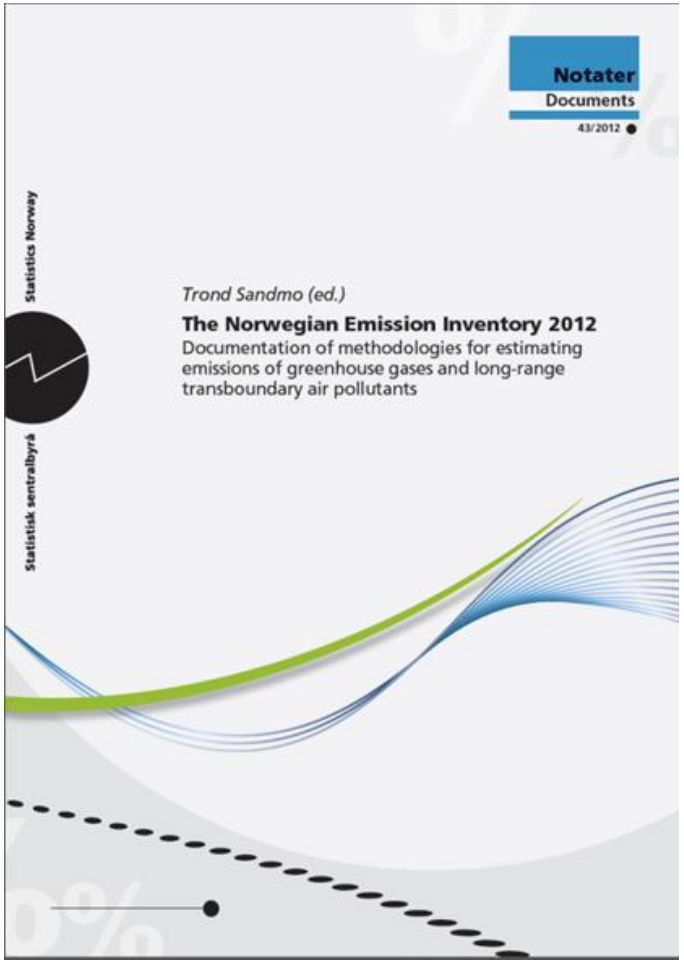
NIR - and an annual documentation report





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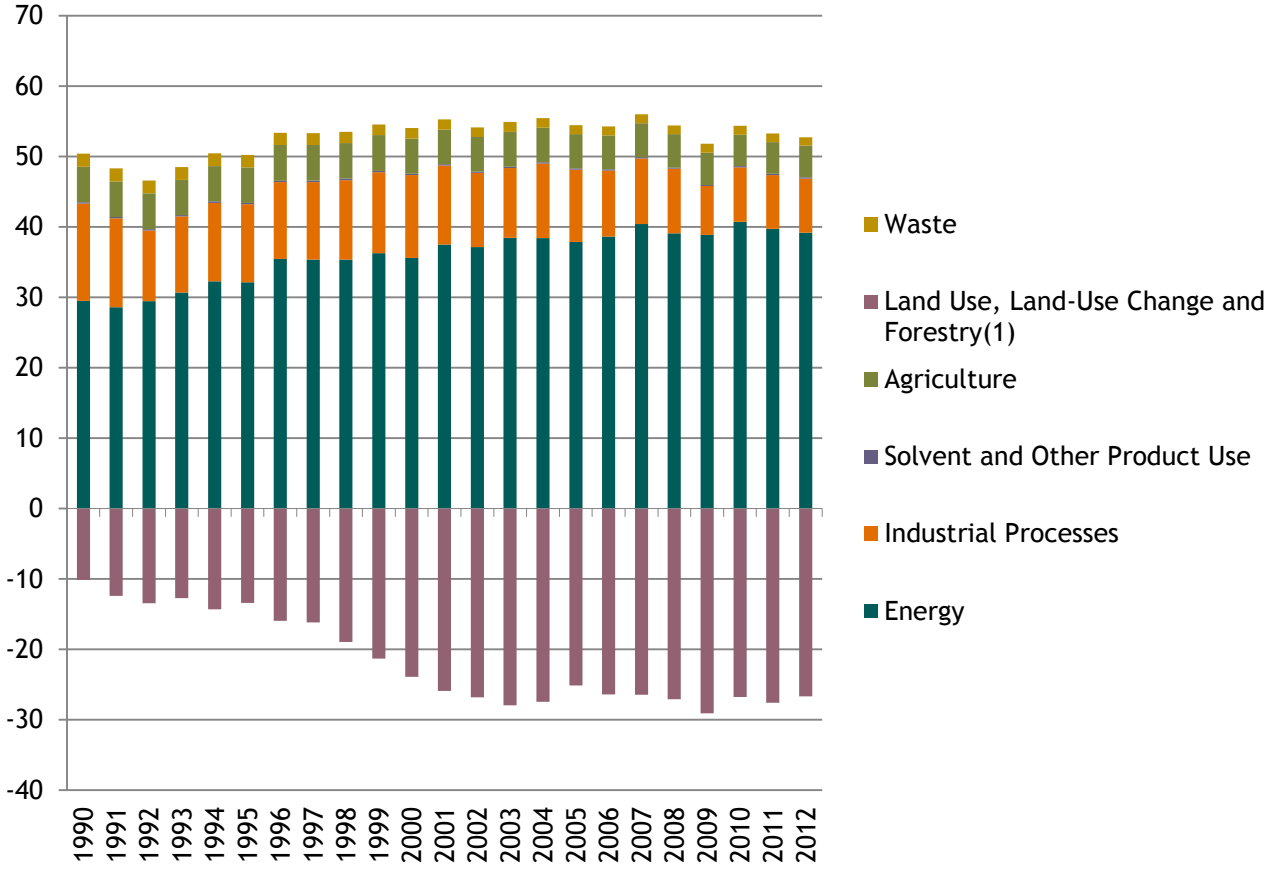
Norwegian greenhouse gas emissions and sinks



Source: National Inventory Report 2014

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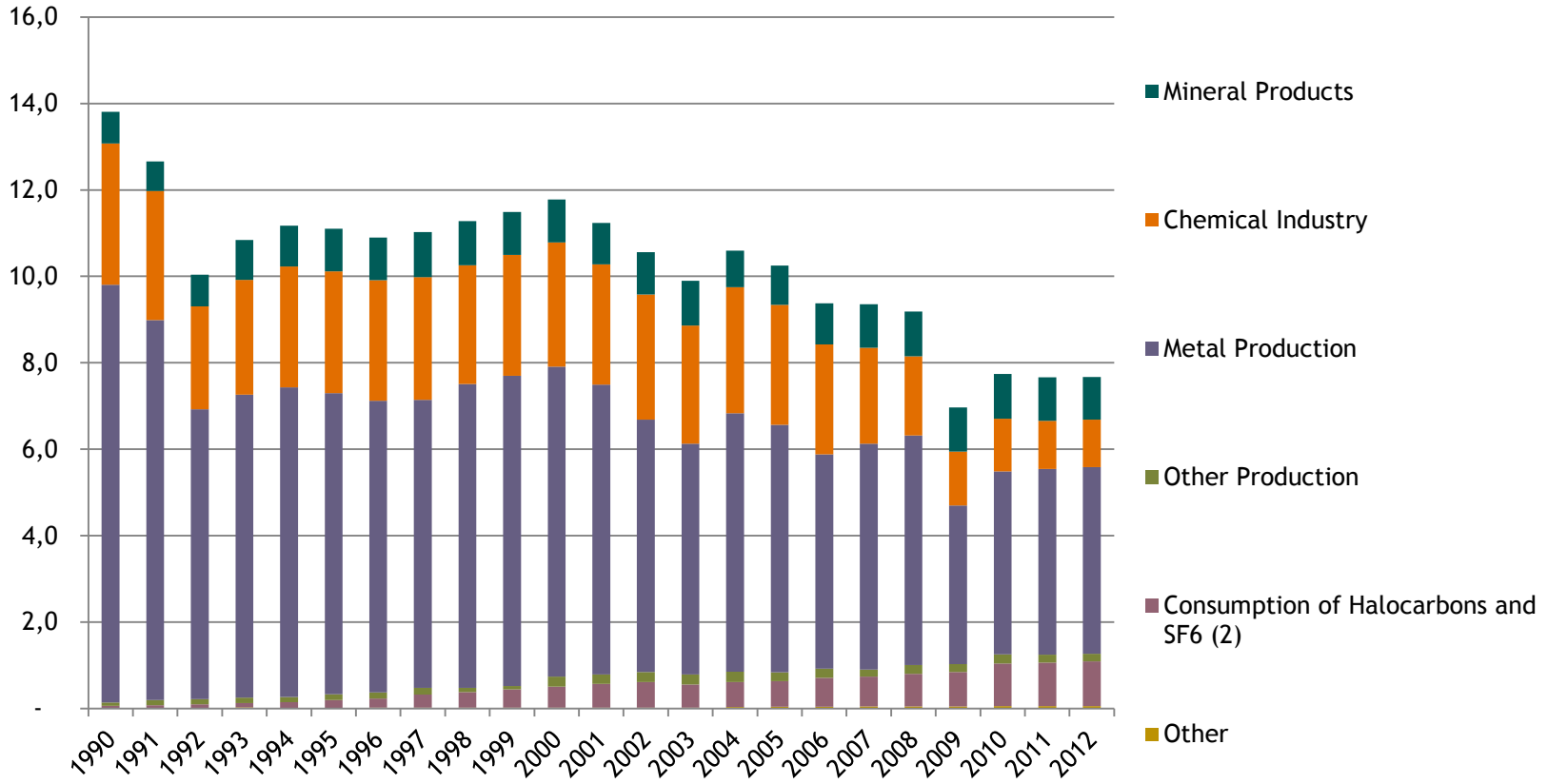
Emission development – Industrial Processes



Source: National Inventory Report 2014

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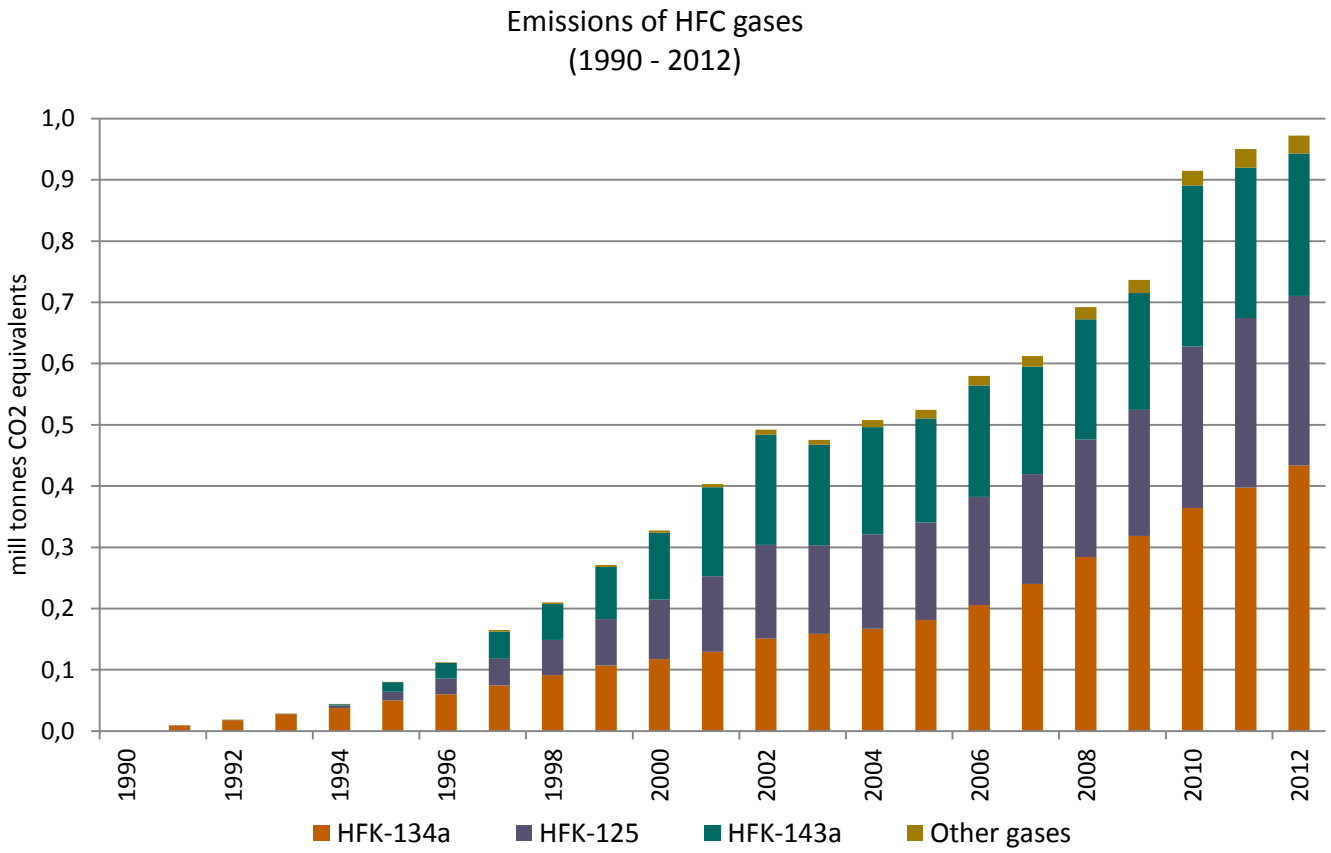
Hydrofluorcarbons (HFCs) in products



Source: National Inventory Report 2014

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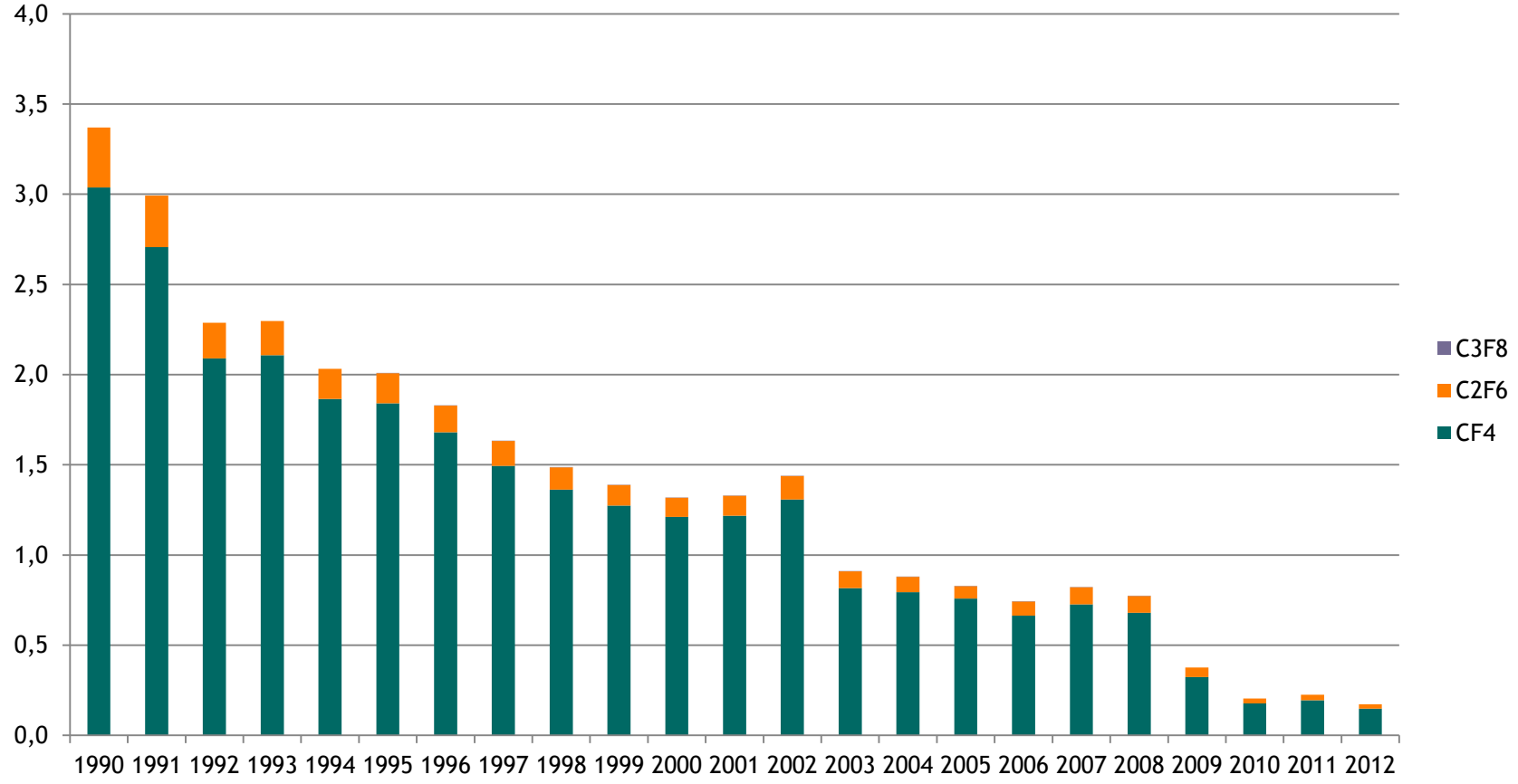
Perfluorcarbons (PFCs) from industry



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Key categories in the sector Industrial Processes

IPCC	Source category	Gas	Key category according to tier	Method
2A1	Cement Production	CO_2	Tier 1	Tier 2
2A2	Lime production	CO_2	Tier 1	Tier 2
2B1	Ammonia Production	CO_2	Tier 1	Tier 2
2B2	Nitric Acid Production	N_2O	Tier 2	Tier 2
2B4	Silicon carbide	CO_2	Tier 2	Tier 2
2B5	Other Chemical Industry*	CO_2	Tier 1	Tier 2
2C2	Ferroalloys Production	CO_2	Tier 2	Tier 2
2C3	Aluminum Production	CO_2	Tier 2	Tier 2
2C3	Aluminum Production	PFC	Tier 2	Tier 2
2C4	SF_6 Used in Aluminum and Magnesium Foundries	SF_6	Tier 1	Tier 2
2F	Consumption of Halocarbons and Sulphur Hexafluoride	HFCs	Tier 2	Tier 2

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Quality control of **plant specific data**

- Reported figures on emissions and activity (eg. Production volume) are first controlled by Environment Agency and then Statistics Norway.

- Implied emissions factors are calculated for emissions from point sources

- Emission factors for time series are checked for consistency and deviations are explained

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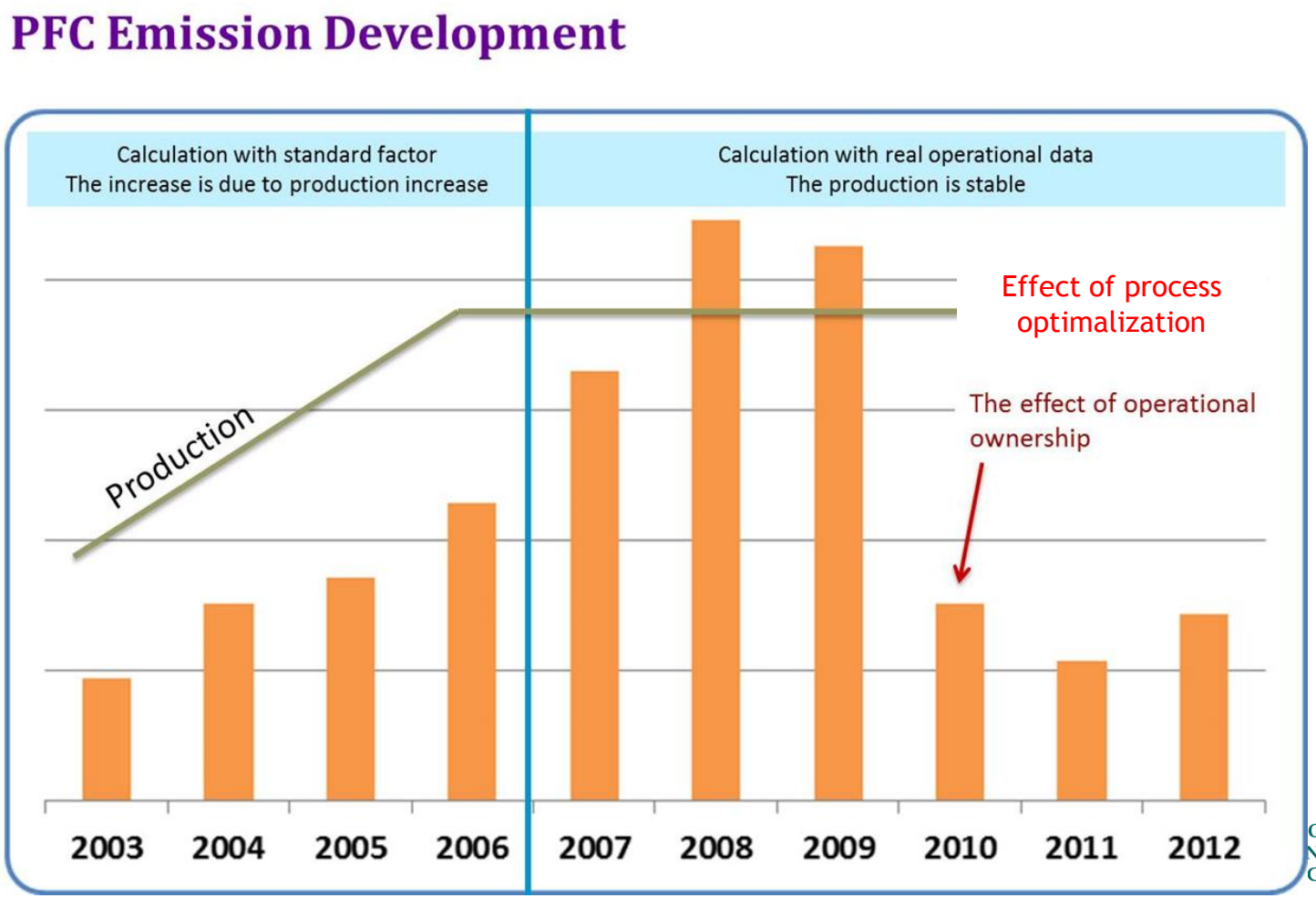
Demand for specific emission factor improved Emission estimats and increased process control

Example from of Norwegian Aluminum Production Plant



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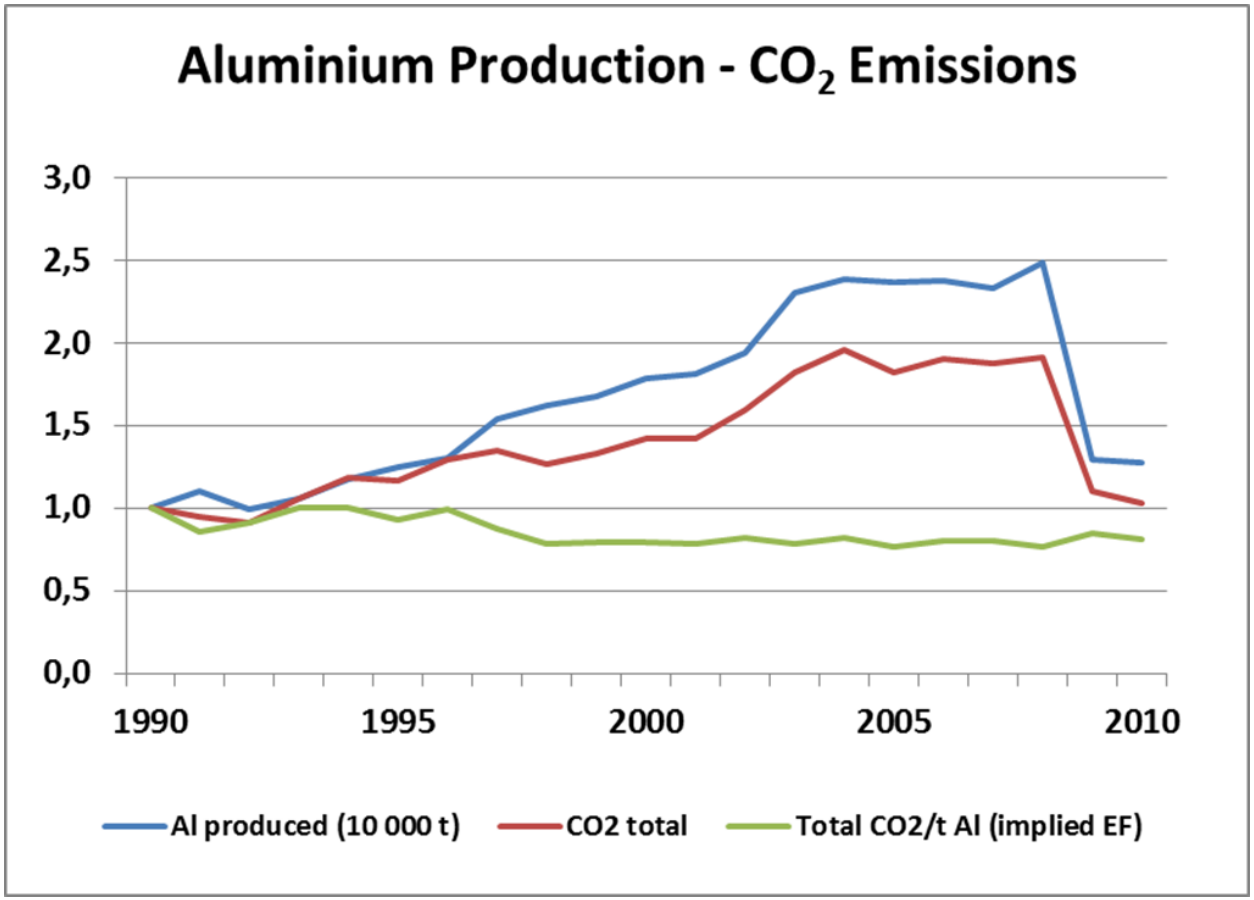
QC at NEA: Trend as expected



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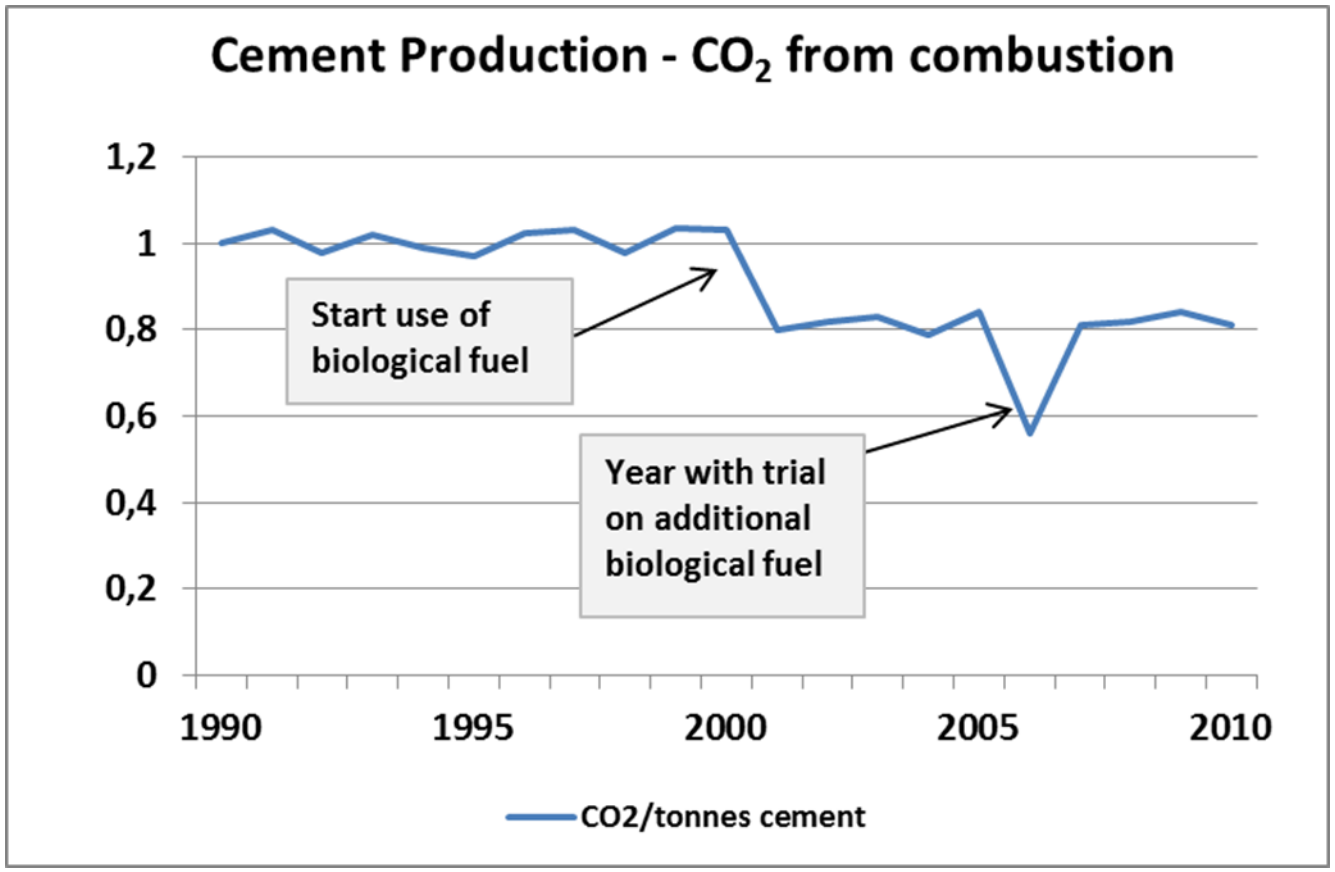
QC at NEA: Change in trend can be explained



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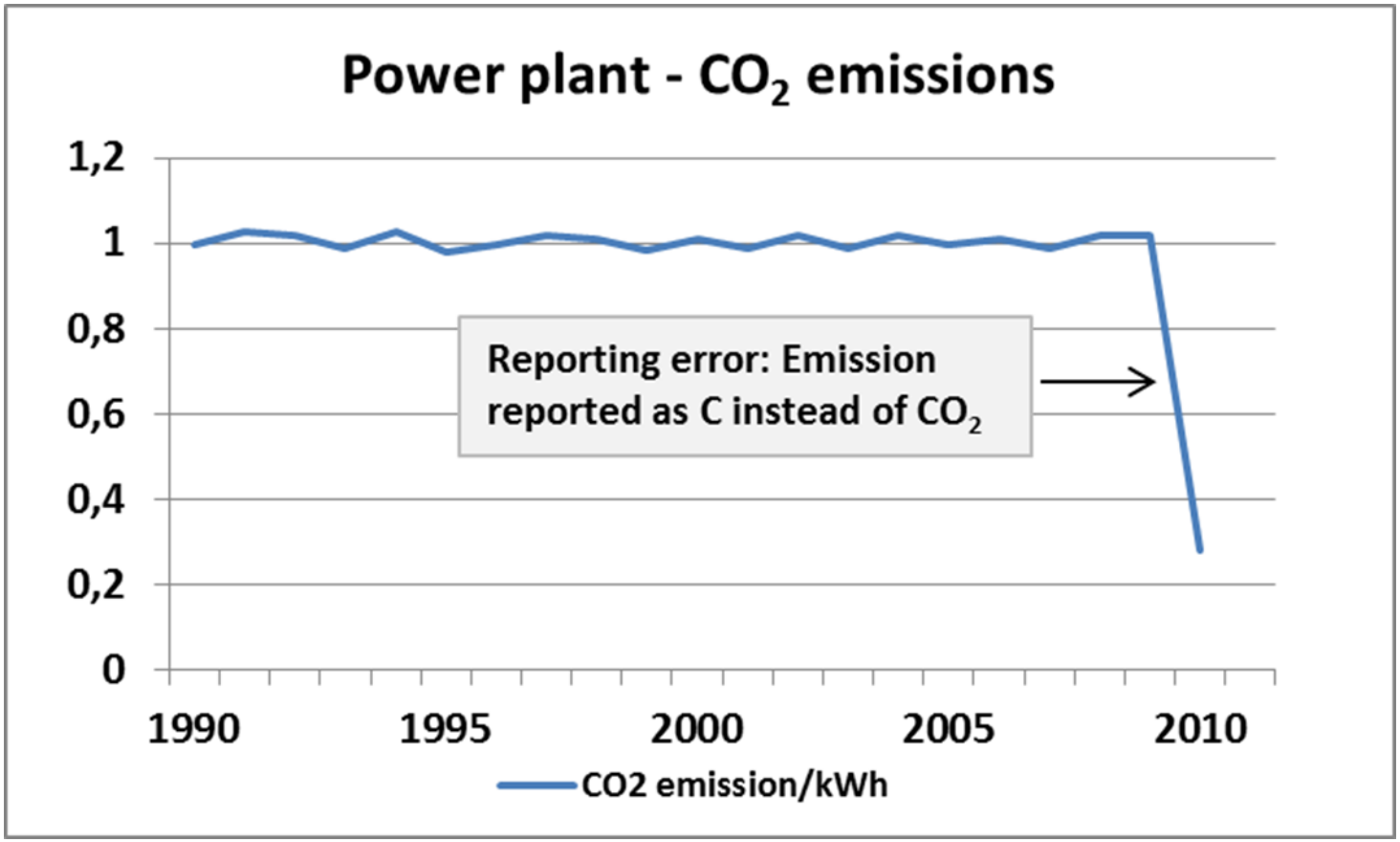
QC at NEA: Reporting Error



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Statistics Norway : QC for estimation of emissions of HFC/PFC:

- Check of times series both for emission factors and activity data
- For each individual gas and application category

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QA and Verification

QA on emissions reported from plants:

- Inspections by CPA - one-day unannounced visit at the site
- Audits by CPA or 3rd party

QA of the entire inventory

- UNFCCC centralized or in-country review
- Review by other experts
- Audits by the Auditor General of Norway

Verification studies

- Comparision of the emission estimates with estimates obtained by using other methods and approaches

- Comparision of the emission estimates with estimates from other countries/regions

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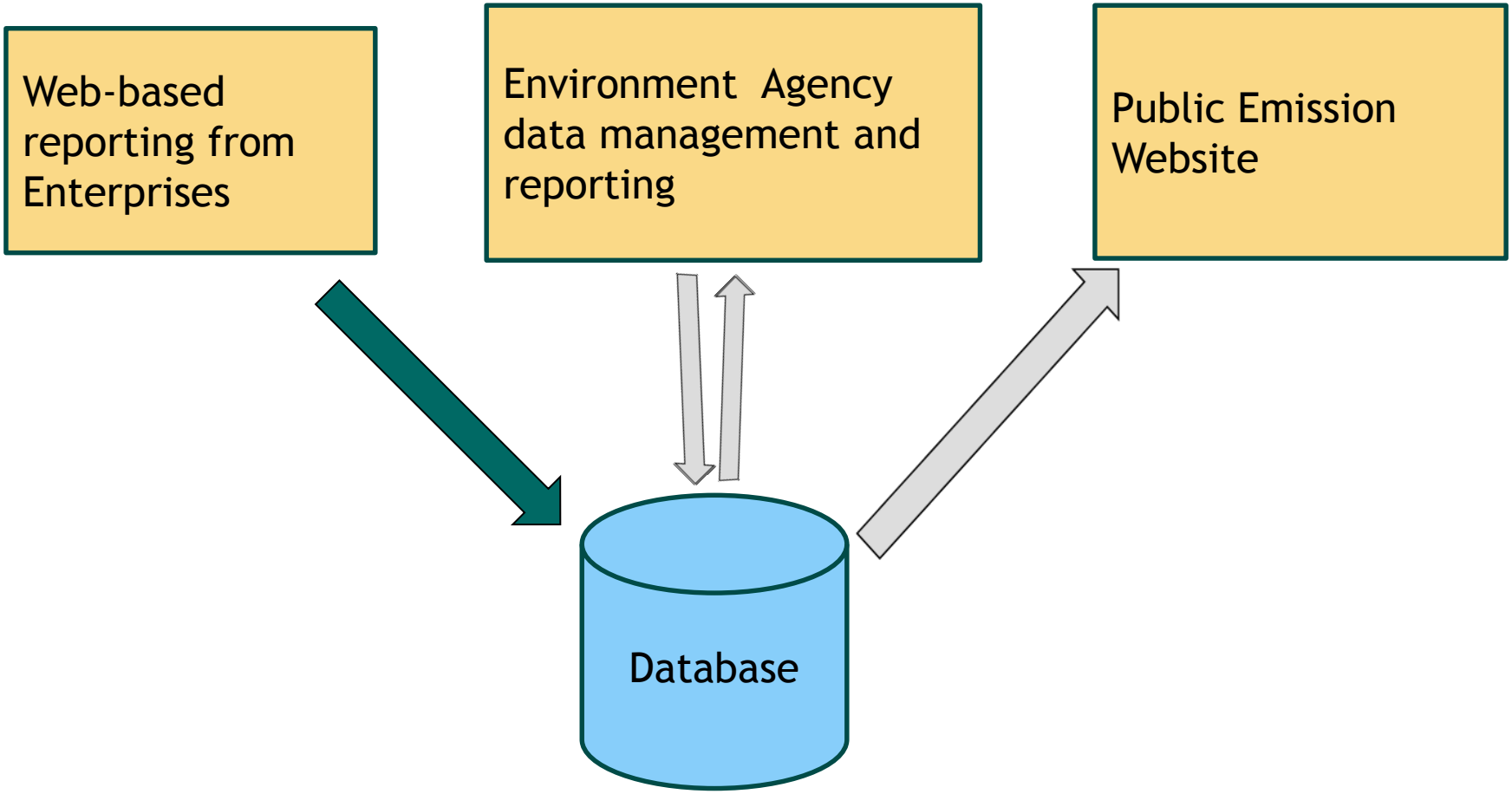
Dataflow from Enterprises



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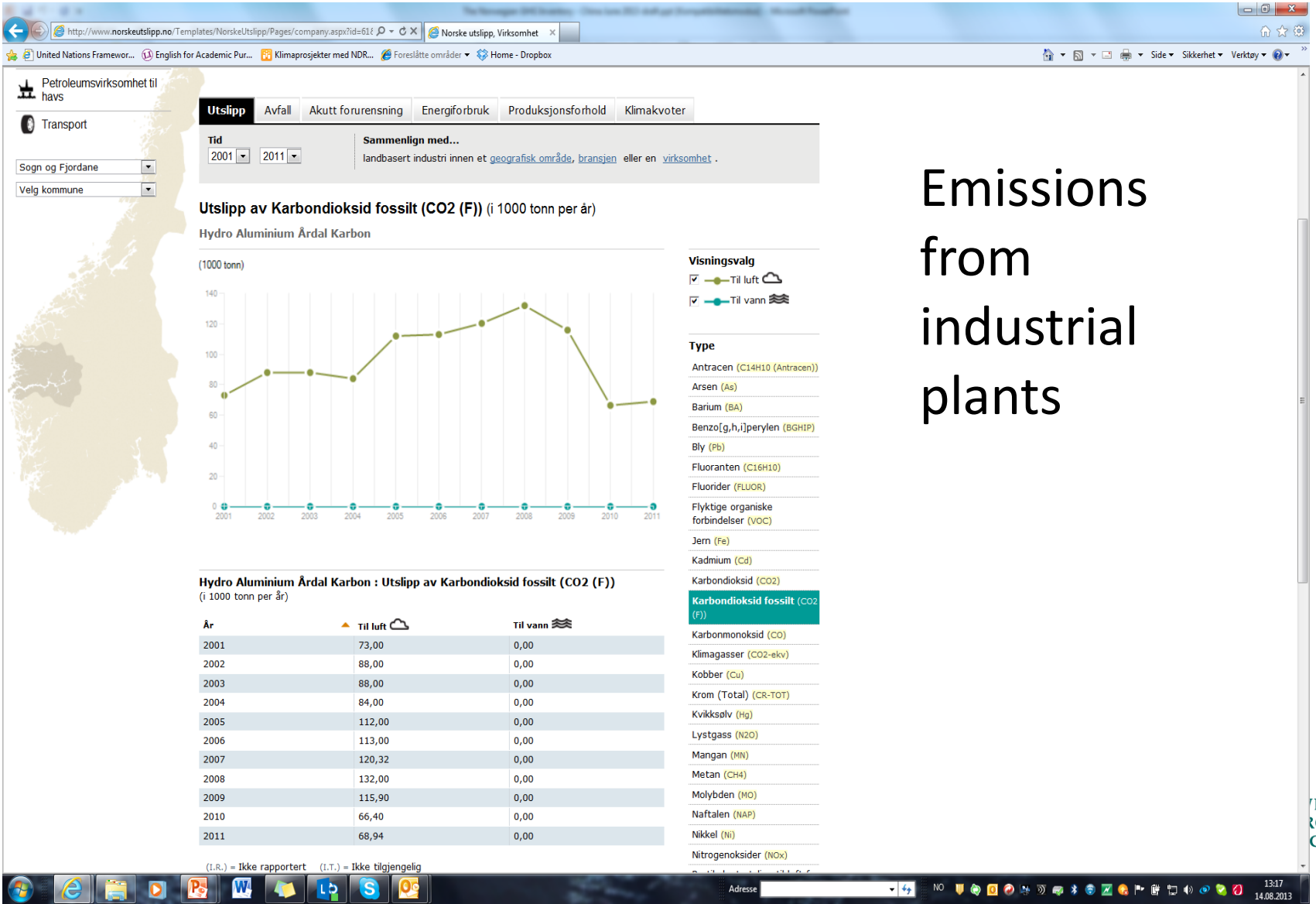
Public web site



År	Til luft	Til vann
2001	73,00	0,00
2002	88,00	0,00
2003	88,00	0,00
2004	84,00	0,00
2005	112,00	0,00
2006	113,00	0,00
2007	120,32	0,00
2008	132,00	0,00
2009	115,90	0,00
2010	66,40	0,00
2011	68,94	0,00

Emissions from industrial plants

Lessons learned

- Process for continuous improvements
- From simple to more advanced
- Complexity must be adjusted to capacity
- Legal basis for data collection
- Use data from single entities, including ETS companies
- Develop stringent QA/QC procedures
- Importance of documentation and good routines for data storage
- Detailed GHG inventories important for policy development

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Thank you