

Technical Dialogue on MRV and Carbon Pricing in the Americas

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MRV and Practical Experience

– The EU ETS experience of Germany –

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Outline

- Why is Monitoring the backbone of ETS?
- Key elements for a robust MRV system
 - MRV – Legal Framework, Compliance Cycle
 - Monitoring Plan & Emissions Report
 - Accreditation, Verification & Penalties
 - Use of IT

Why is Monitoring & Reporting most relevant?

- EU ETS gives flexibility to 11,000 operators ...
... allows emissions to be cut where cheapest!
- Flexibility ends when **actual emissions must be reported**
- **Monitoring principle:**
„One tonne CO₂ emitted must be one tonne CO₂ reported!“
to avoid market distortions and to guarantee a level-playing-field!
- All operators shall **surrender** allowances in the Emissions Trading Registry on the basis of **complete** annual Monitoring & Reporting
- Monitoring & Reporting – „The flip side of the coin“
... **free allocation** vs. **compliance cost**

Why is Monitoring & Reporting most relevant?



Why is Monitoring & Reporting most relevant?



You can only control what you can measure!

General principles of Monitoring & Reporting

- Completeness (all sources covered, no data gaps)
- Transparency
- Credibility
- Accuracy (high level of certainty)
- Consistency
- Comparability (over time)
- Continuous improvement

MRV – Legal Framework in EU

EU ETS Directive 2003/87/EC

Phase 1 & 2 (2005–2012):

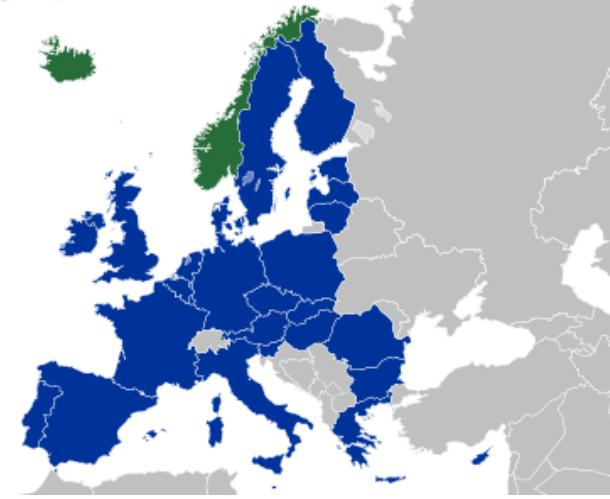
Monitoring & Reporting Guidelines (MRG – Decision 2007/589/EC):
provided the framework for monitoring, reporting & verification

- **Germany: GHG Emissions Trading Act** (“TEHG”) – but not all Member States had implemented MRG into national law

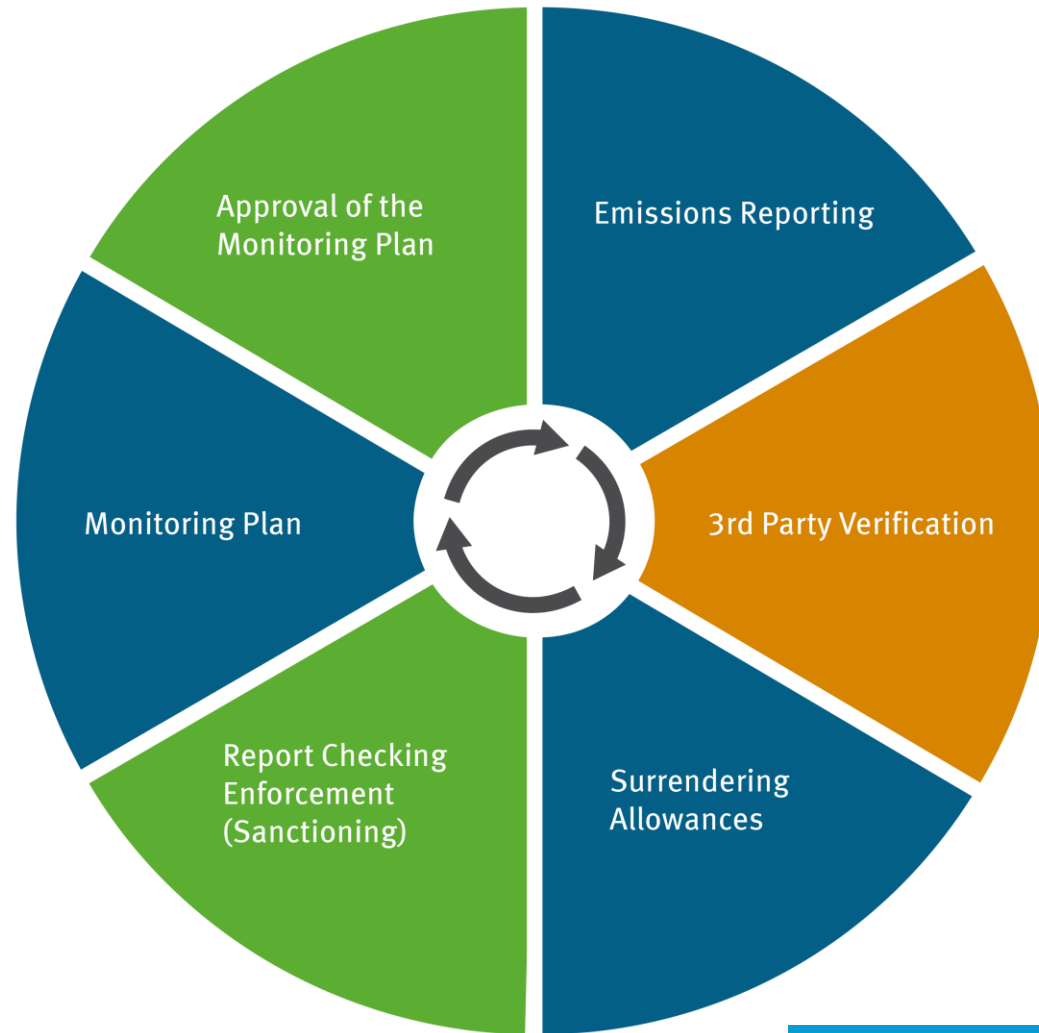
→ Need for more harmonization on EU level!

Phase 3 (2013–2020):

- **EU Monitoring and Reporting Regulation – MRR (2012)**
→ **Directly binding to operators!**
- **EU Accreditation and Verification Regulation (2012)**



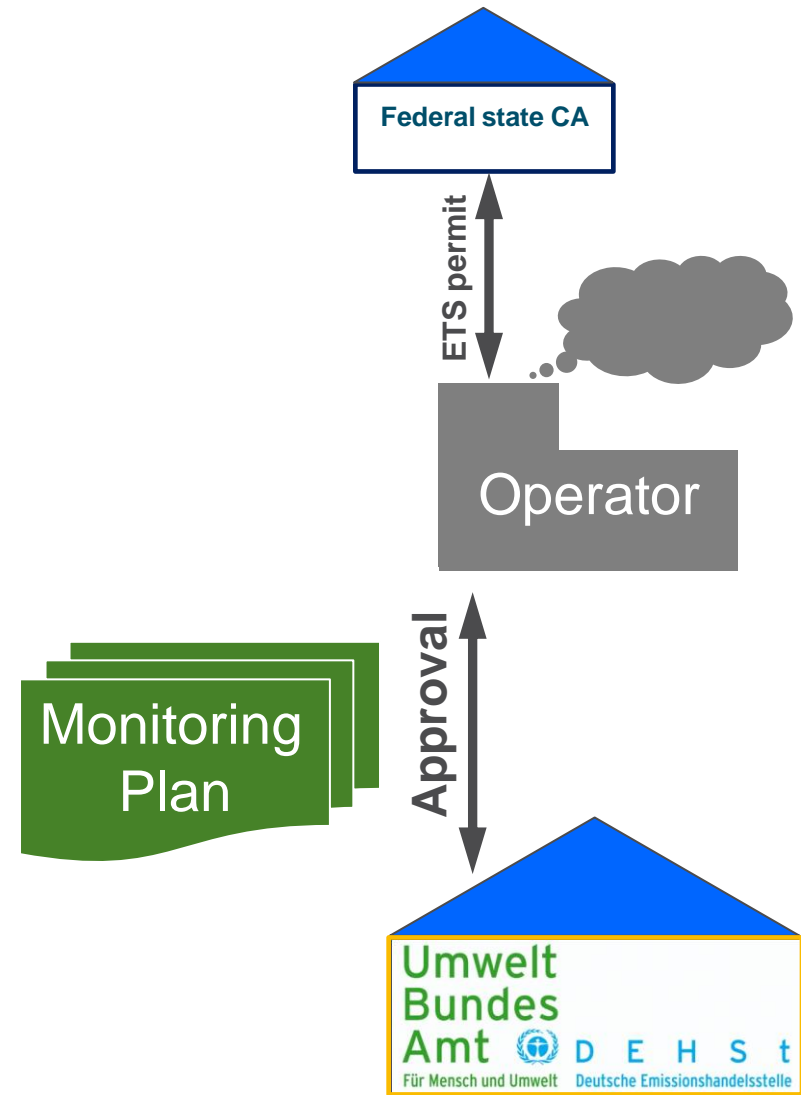
EU ETS Compliance Cycle - Monitoring and Reporting



- DEHSt's tasks
- Operator's tasks
- Verifier's tasks

Monitoring Plan

- Emissions reporting is based on an **installation-specific** Monitoring Plan
 - Setting out detailed, complete and transparent documentation concerning the **methodology** used for the determination of GHG emissions
 - Has to be **approved** by the competent authority before starting operation
- The better the monitoring plan, the higher the quality of the emissions report!



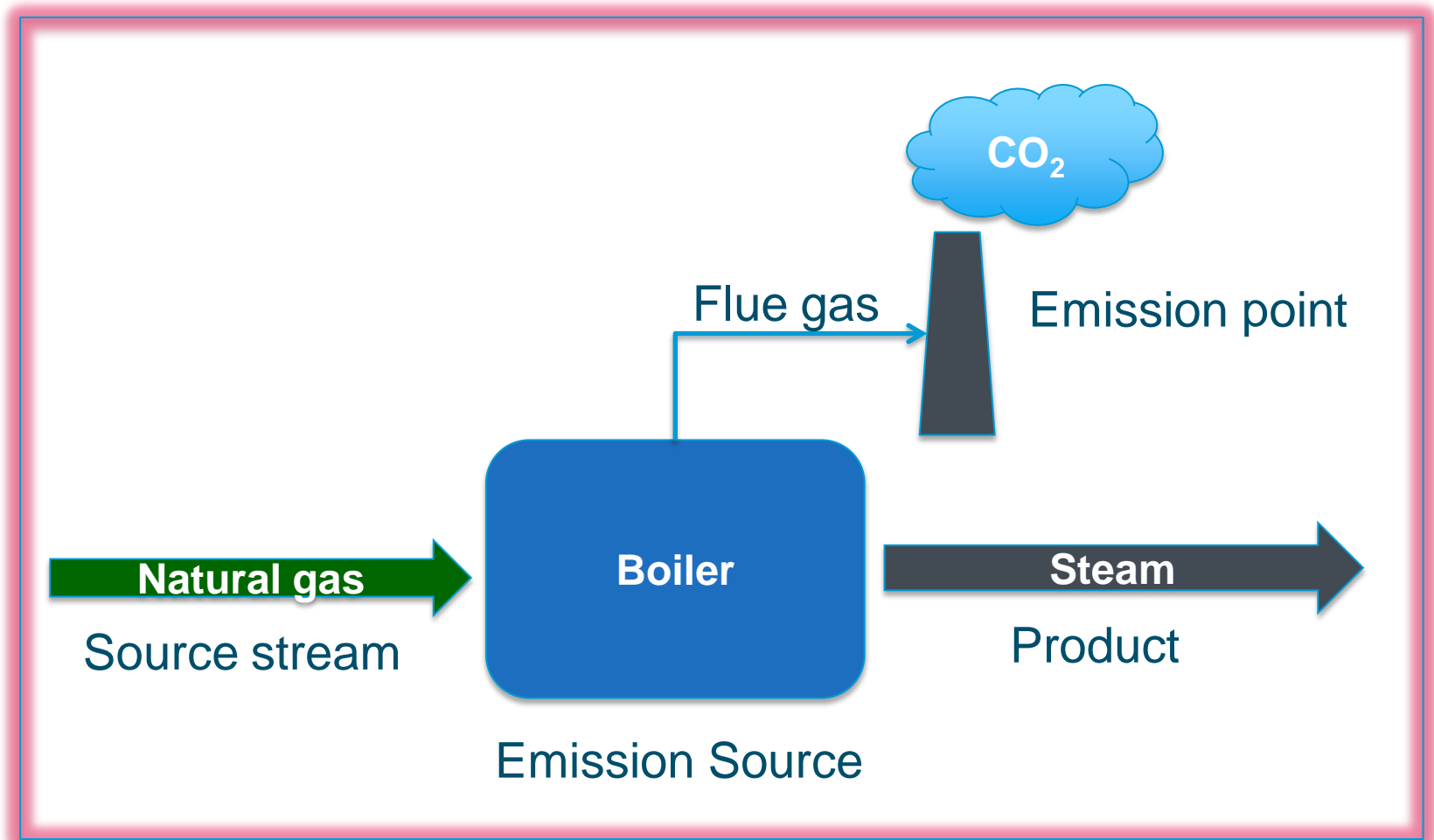
What is subject of MRV – What are the EU ETS installation boundaries?

All parts of the ETS installation...

- under the control of the operator
- necessary for running the installation's activities, e.g.
 - all potential emission sources listed in Annex IV MRR
 - Furnaces, kilns, flares, etc.
- covered by the GHG emissions permit

→ Clear definitions: entities, enterprises, operators, installations, facilities, establishments, sub-installations ...

Explanation of terminology used in ETS



Most important aspects of a Monitoring Plan

- Non-technical description of the installation and its activities
- **Flow chart** (simple diagram) which shows:
 - **Source streams** used (e.g. coal, natural gas etc.)
 - **Emission sources** (e.g. boilers)
 - **Measuring instruments** determining the amount of the source streams
 - **Location of sampling points**
- List of activities according to ETS-Directive (e.g. combustion)
- List of source streams
- Description of methods used to determine the parameters relevant for GHG calculation

Tier approach – What is meant?

Tier = data quality level

General rule:

- The **larger one emitter is**, as higher the monitoring requirements are, and therefore higher tiers are required.
- For smaller emitters lower monitoring requirements and lower tiers are required.

Activity data (amount of source stream)	Calculation factor
Tier 1 = $\pm 7,5 \%$	International standard value
Tier 2 = $\pm 5 \%$	National standard value
Tier 3 = $\pm 2,5 \%$	Individually determined by analysis
Tier 4 = $\pm 1,5 \%$	---

Low data quality



High data quality

Installation category	Number of installations in Germany	Total annual emissions
Category C >500 kt CO ₂ -eq/a	145	380.4 Mio. t CO ₂ -eq
Category B >50 kt CO ₂ -eq/a	412	62.5 Mio. t CO ₂ -eq
Category A <= 50 kt CO ₂ -eq/a [installation with low emissions, i.e. 25 ...]	1348 [1077]	18.3 Mio. t CO ₂ -eq [8.7 Mio. t CO ₂ -eq]

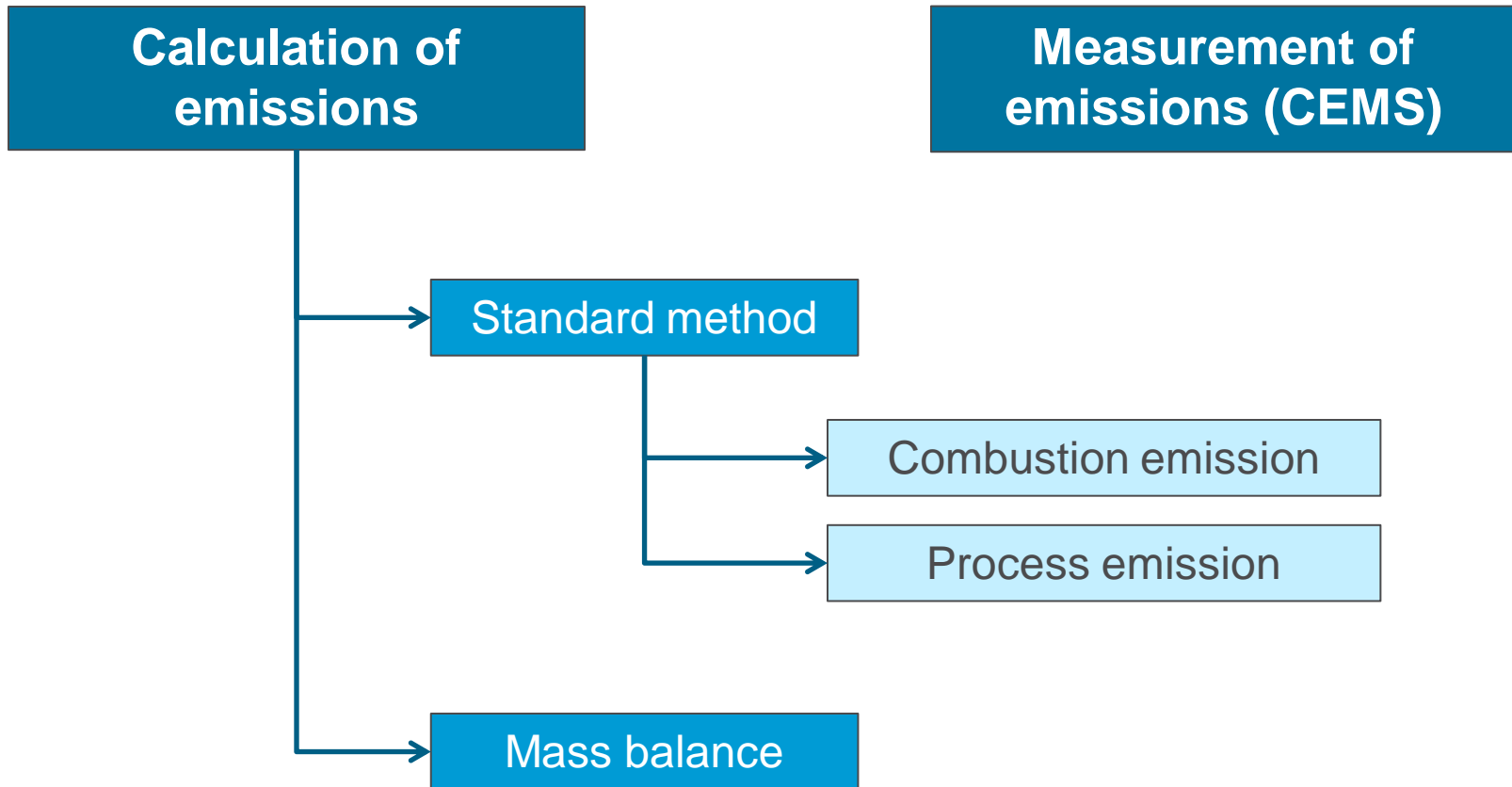
82 %

14%

4%

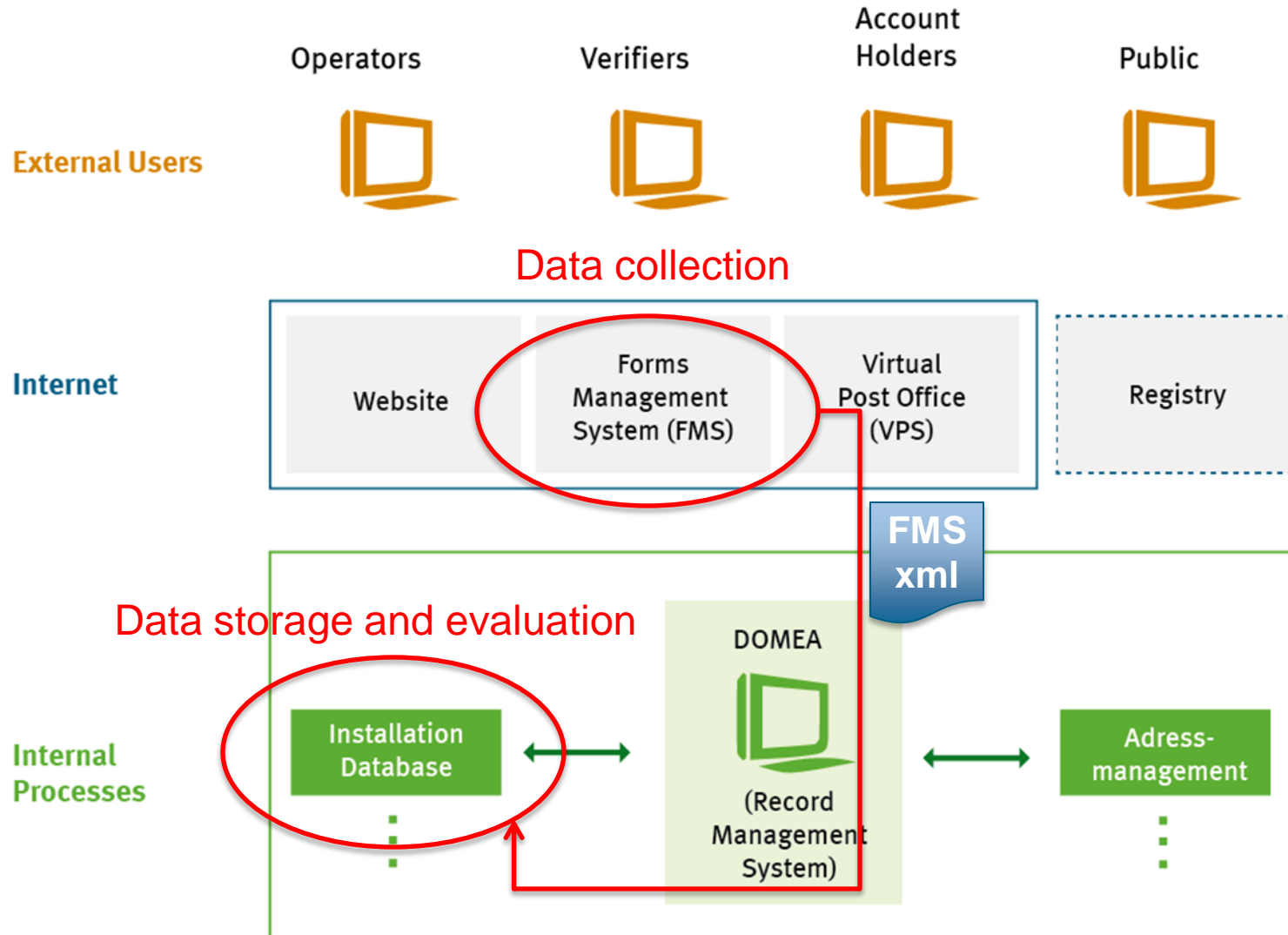
[1,9%]

Principle methods for determination of emissions (Art. 21 MRR)



Use of IT: Data Collection & Data Evaluation

IT-Structure DEHSt



Assistance for operators: Virtual communication – fast and safe!

- Server-based **electronic monitoring plan** and **emissions report**
 - Guides the operator through the system
 - Automated checks on missing or implausible data
 - Reduces the potential for errors
 - Different user roles / access rights for operator and verifier
 - Increases the cost-effectiveness of checking reports on the part of DEHSt
- National guidance papers
- FAQ

FUEL STREAM (EMISSION FACTOR RELATED TO CALORIFIC VALUE)			
Is there any deviation from the tier of the Monitoring Guidelines (target-tier)?	No.	<input type="text"/>	
Consumed fuel			
Quantity			
Tiers according to the Monitoring Guidelines (target-tier)	121,547.5	t	
	4	<input type="text"/>	
Tiers according to the monitoring plan (chosen tier)	4	<input type="text"/>	
Net calorific value			
Value	28.3380	GJ/t	Default value 28.3000
Tiers according to the Monitoring Guidelines (target-tier)	3	<input type="text"/>	
Tiers according to the monitoring plan (chosen tier)	3	<input type="text"/>	
Emission factor			
Value	0.0925	t/GJ	Default value 0.0930
Biomass percentage	00	%	
Tiers according to the Monitoring Guidelines (target-tier)	3	<input type="text"/>	
Tiers according to the monitoring plan (chosen tier)	3	<input type="text"/>	
Oxidation factor	1.0	<input type="text"/>	
CO₂-emissions			
	318608.208	t CO ₂	
The material data is ...	<input checked="" type="checkbox"/> appropriate.	<input type="checkbox"/> not appropriate.	
The information about the tiers is...	<input checked="" type="checkbox"/> appropriate.	<input type="checkbox"/> not appropriate.	
The report was carried out according to the chosen tier?	<input checked="" type="checkbox"/> Yes.	<input type="checkbox"/> No.	

12 years of lessons learned in the EU

Issues / problems associated with the approval of MPs:

- Intransparent description of monitoring methods
- Issues concerning activity data or calculation factors
- CEMS
- Transfer of CO₂
- Formal issues

In around 50% of all MPs the operators were asked to correct mistakes or to deliver additional information (clarifications or necessary evidences).

Typical errors in Emission reports:

- Missing source streams, emission sources (flares, sour gases of sulphur recovery plants, hydrogen for SCOT units etc.)
- Supplier data not available / not delivered
- Frequency of analyses

Enforcement, Non-Compliance and Penalties

Sanctions, fines and penalties needed for enforcement

- GHG monitoring based on trust in operator/supplier data
- Independent verification helps, but cannot ensure reliable M&R
- Sanctions for surrendering non-sufficient allowances (**100 €/t CO₂**)
- Fines for breaches of duty of care, i.e. cases of deliberate and negligent acting (in Germany: between **50 and 500 T€**)
 - Operator does not surrender a monitoring plan
 - Operator does not submit an emissions report
 - Operator submits a report that is not in line with monitoring plan
 - Operator **does not report all actual emissions**

→ The amount of impending sanctions must be **higher** than potential benefits!

Conclusions & recommendations

- Legal framework, monitoring & reporting regulation directly binding for operators
- Accreditation: Who verifies the verifier?
- Powerful competent authority with professional scepticism, strict enforcement incl. financial penalties (sanctions)
→ “A tonne must be a tonne”
- Use of IT wherever possible – not only Excel
 - Electronic Data Collection & Data Evaluation
 - Safe & user-friendly Emissions Trading Registry

→ **Solid MRV is a key pre-requisite for linking!**

Thank you!

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Experiences with CEMS (Continuous Emissions Measuring) I

- CEMS can be interesting for installations
 - that have a lot of input and output source streams, which do not easily reach the required tiers or
 - where CEMS is already existing e.g. for determination of NO_x
- 44 CEMS for CO₂
 - combustion, refinery and chemical installations
 - Only 16 meet the highest tiers
- 20 CEMS for N₂O
 - nitric acid and adipic acid installations
 - Only 11 meet the highest tiers

Experiences with CEMS II

- Typical mistakes:
 - Default values are not in line with Art. 45 MRR
 - Exceeding of the relevant calibrating range
 - uncertainty of CEMS has been subtracted from the estimated yearly concentration (this is permitted for CEMS used for Federal Immission Control Act, but not for CEMS used for MRR)
 - Missing quality assurance
 - No corroborating calculation
- ➔ Operator needs a lot of knowledge about CEMS to comply with all MRR requirements
- ➔ Adding of MRV requirements to the national administrative instruction for CEMS

Form-Management-System (FMS) is available via the DEHSt Website

The screenshot shows the DEHSt website with the following elements:

- Header:** "Umwelt Bundes Amt" logo with "DEHSt" and "Für Mensch und Umwelt Deutsche Emissionshandelsstelle". Navigation links: "Kundenservice +49 (0)30 8903 5050 | Hilfe | Kontakt | Inhaltsverzeichnis | Glossar | Presse | Über uns | Deutsch".
- Navigation Bar:** "FMS-Startseite", "Stationäre Anlagen", "Luftverkehr / Aviation" (highlighted), "Strompreiskompensation".
- Breadcrumbs:** "FMS-Startseite > Luftverkehr / Aviation".
- Main Content:**
 - Formular-Management-System - Luftverkehr / Aviation**
 - Text: "Please, choose on left side the application."
 - Text: "The DEHSt reserves for itself to adapt the versions of the form applications to a new stage of development at any time, to provide further functionalities as well as to optimize or cancel existing functionalities."
 - Text: "As a rule, data which have been entered in the pre-version remain unchanged."
 - Text: "Please note that all applications which are offered over this page have a common user administration at their disposal. You find these under 'User Management for the Aviation Sector'."
 - Text: "Please note that DEHSt provides its software applications for a certain period of time only. We switch off old applications, which are no longer valid for reporting or applying for allocation. However, should you need access to an old software please contact our [customer service](#)."
- Left Sidebar (Applications):**
 - > Report Annual Emissions 2013-2020
 - > Monitoring Plan Tonne-Kilometre Data 2014 (special reserve)
 - > Monitoring Plans for Annual Emissions 2013-2020
 - > Report Annual Emissions 2010-2012
 - > Monitoring Plan Annual Emissions 2010-2012
- Right Sidebar (Support):**
 - Support**
 - Telefon, Fax und E-Mail**
 - Telefon: +49 (0)30 8903-5050
 - Fax: +49 (0)30 8903-5010
 - E-Mail: emissionstrading@dehst.de
 - Internet: www.dehst.de

www.formulare.dehst.de

(For stationary installations only in German. Aviation in English)