

**Umwelt
Bundesamt**



DEHSt
Deutsche
Emissionshandelsstelle

Study visit Chile



Monitoring and Reporting: Monitoring Plan

Delia Fahle, Rebeca Sahagún Martínez

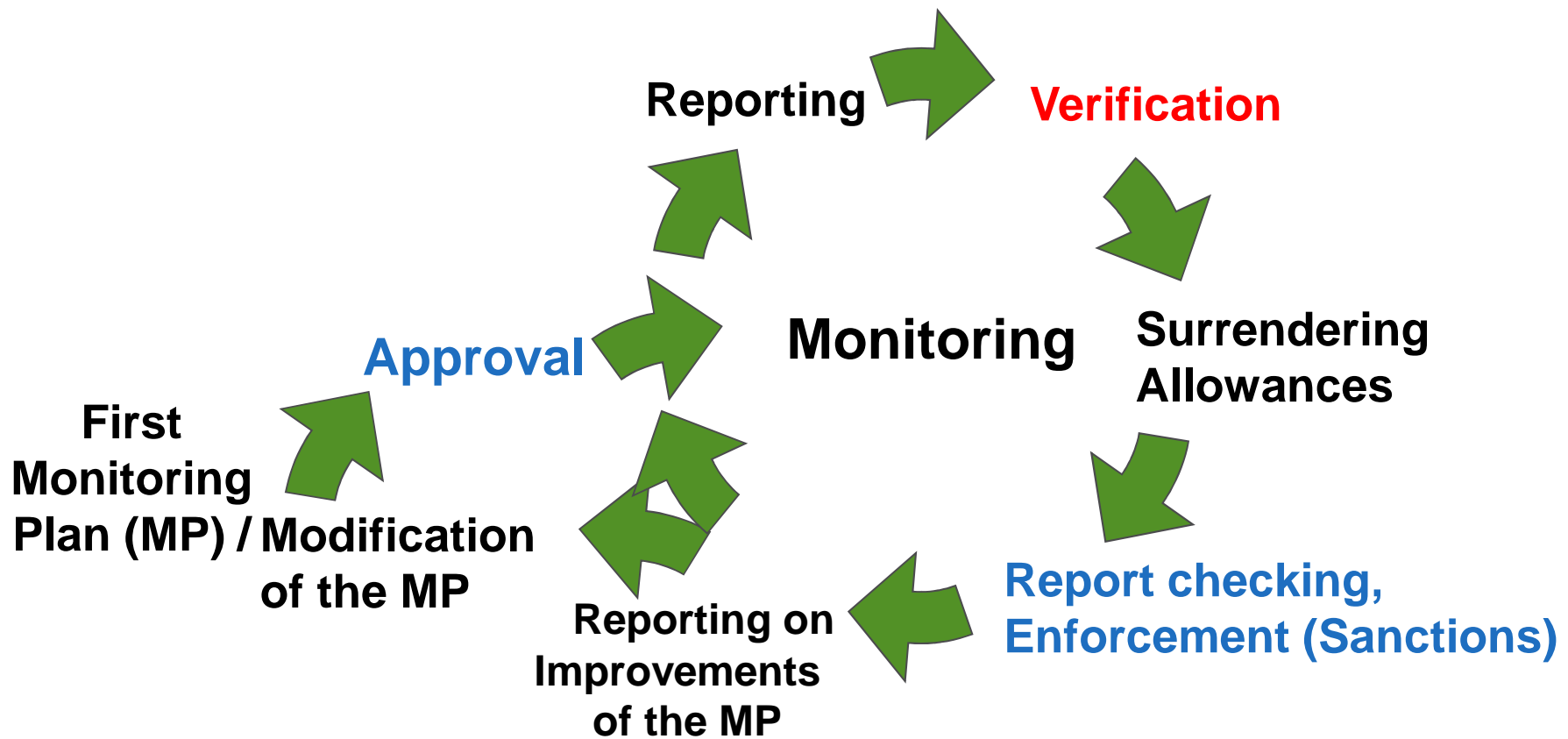
E 2.2 Chemical Industry and Industrial Combustion Installations
13th of December 2017 – DEHSt / German Emissions Trading Authority

Outline

- Why do we need a Monitoring Plan?
- Data Collection: Form-Management-System (FMS)
- Data Evaluation: Installation of Data Base (ADB)
- Assistance for Operators

Why do we need a Monitoring Plan?

EU ETS Compliance Cycle for Monitoring, Reporting and Verification



black: Operator's tasks
blue: Authority's tasks
red: Verifier's tasks

Reasons for a Monitoring Plan (MP)

- MP is the first step in the compliance cycle
 - the better the MP the better the emissions report (ER)
- An approved MP guarantees legal security for the operator; assures that the monitoring methods are ok and can be used for creating an ER
- An approved MP binds the operator to the described monitoring methods
 - the competent authority has checked the determination of e.g. calculation factors before the emissions report is created

Content of a Monitoring Plan (I)

MP describes all relevant data and monitoring methods for the installation

- Installation boundaries (description, flow chart)
- Technical processes of the installation (combustion, production of chemicals,...)
- List of all source streams
 - That means
 - all fuels in case of combustion installations or
 - e.g. all carbon containing input and output streams for chemical installations.
- For each source stream the expected emission amount has to be declared. The installations emissions are relevant for the category of the installation and therefore for the requirements for each single source stream.
- For each source stream the operator has to describe how the amount and the relevant calculation factors are estimated.

Content of a Monitoring Plan (II)

- For each source stream the operator has to describe how the amount and the relevant calculation factors are estimated:

Source stream amount:

- Measuring devices inclusive quality control and uncertainty assessment
- Conservative estimations

Calculation Factors (net calorific value, emissions factor, biomass content,...):

- Sampling plan
- Analysis frequency
- Applied norms for analyses
- Accreditation of laboratories
- Usage of standard factors
- Conservative estimations

- The legal requirements base upon the amount of installations emissions: the more GHG are emitted, the higher are the requirements

Experience of DEHSt with first approval of MPs

- Approximately 1.900 installations in Germany
 - In around 50% of all MPs the operator was asked
 - to correct mistakes in the MP or
 - to give more information (necessary evidences or clarifications).
 - Many MPs had to be corrected by the operator more than one time.
 - Many administrative orders of the MPs contain collateral clauses.
- The quality of the MP defines the quality of the emissions report!

Monitoring Example 2. Trading Period: Harry Heater

No./Description of fuel or material stream: 2 Mix of natural gas type H from grid and natural gas type L from the Netherlands			
Deviation from required tier level according to MRG applies because of...			
<ul style="list-style-type: none"> <input type="radio"/> Minor source stream (see specifications in Ch. 6.1) <input type="radio"/> De minimis source stream (see specifications in Ch. 6.1) <input type="radio"/> Pure biomass fuel or material (see specifications in Ch. 6.2) <input type="radio"/> Category B or C installations: Compliance with the highest tier level specified in Annexes II-XI MRG regarding one or several parameters is not feasible for technical reasons or would cause unreasonable high costs (please enclose reasons and evidence in a separate document to be enclosed with the monitoring plan). <input type="radio"/> Category A installations: Compliance with the tier level specified in Table 1 Annex I MRG regarding one or several parameters is not feasible for technical reasons (please enclose reasons and evidence in a separate document to be enclosed with the monitoring plan). 			
	Level specified in MRG	Level to be applied	Source of information or description of data collection method
<ul style="list-style-type: none"> ▪ Fuel/material stream¹⁵ 	4	4	Determination of natural gas consumption by supplier through officially verified turbine meter with volume corrector, documented in monthly delivery notices. Overall uncertainty for measurements: 1.7 %. Control measurements of incoming natural gas are also taken by the company using an officially verified ultrasonic meter with volume corrector. Overall uncertainty of measurements 1.6 %. For evidence of conformity with the selected accuracy requirements see chapter 7 of the monitoring plan. For possible discrepancies between either natural gas measuring systems see free text under <i>Additional information...</i>
<ul style="list-style-type: none"> ▪ Net calorific value 	3	3	DIN EN ISO 6976 (calculation calorific values)
<ul style="list-style-type: none"> ▪ Emission factor 	3	3	DIN EN ISO 6976 (Determination of carbon content in the gas composition through process GC)
<ul style="list-style-type: none"> ▪ Composition data 	---	---	---
<ul style="list-style-type: none"> ▪ Oxidation factor 	According to TEHG amendment of 07/08/2007; Annex 2, Part 1 no. 2 Oxidation factor = 1.0		
<ul style="list-style-type: none"> ▪ Conversion factor 			
... where applicable, add further source streams relevant to Activity 1 (by copying the shaded area)!			

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 NOx
- 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

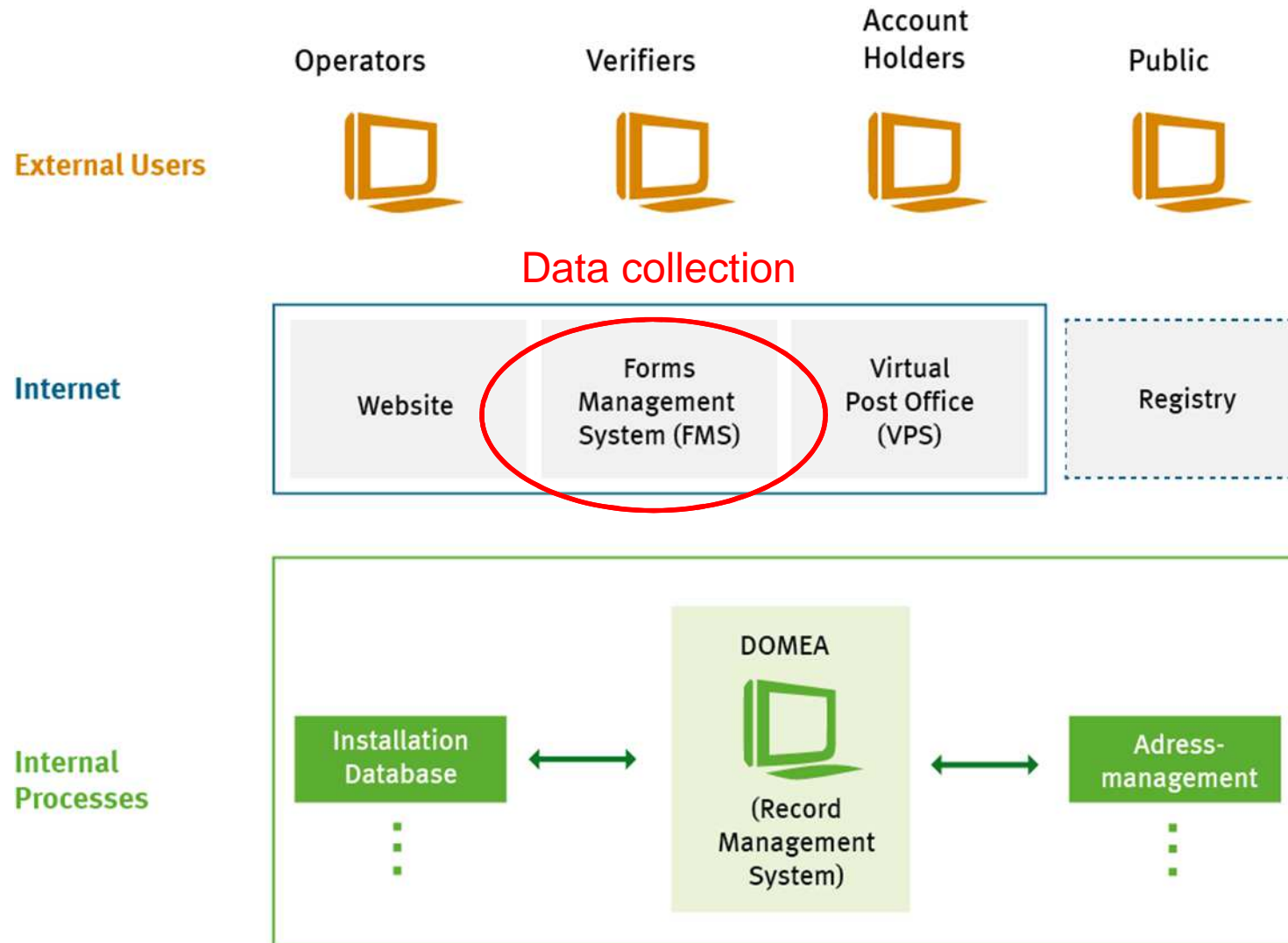
- Typical mistakes:
 - Default values are not in line with Art. 45 MRR
 - Exceeding of the relevant calibrating range
 - uncertainty of CEMS has been subtracted from the estimated yearly concentration (this is permitted for CEMS used for Federal Immission Control Act, but not for CEMS used for MRR)
 - 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

Data Collection: Form-Management-System (FMS)

IT-Structure DEHSt



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

The screenshot shows the DEHSt website interface. At the top, there is a navigation bar with the DEHSt logo and the text 'Für Mensch und Umwelt Deutsche Emissionshandelsstelle'. To the right of the logo, there is a list of links: 'Kundenservice +49 (0)30 8903 5050 | Hilfe | Kontakt | Inhaltsverzeichnis | Glossar | Presse | Über uns | Deutsch'. Below the navigation bar, there is a horizontal menu with four items: 'FMS-Startseite', 'Stationäre Anlagen', 'Luftverkehr / Aviation' (which is highlighted in blue), and 'Strompreiskompensation'. Below the menu, there is a breadcrumb trail: 'FMS-Startseite > Luftverkehr / Aviation'. The main content area is titled 'Formular-Management-System - Luftverkehr / Aviation'. It contains several paragraphs of text: 'Please, choose on left side the application.', '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.', 'As a rule, data which have been entered in the pre-version remain unchanged.', '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".', and '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](#).' On the left side of the main content area, there is a sidebar with a list of links: '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', and 'Monitoring Plan Annual Emissions 2010-2012'. On the right side of the main content area, there is a 'Support' section with the title 'Telefon, Fax und E-Mail' and contact information: '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)

FMS is an Electronic Form to provide Installation's Data

Allgemeine Informationen

DEHSt Aktenzeichen	14310-0000
Version	(nicht ausgefüllt)
Letzte Änderung	28.01.2016
Modus	Lesemodus

Formularverwaltung

- Deckblatt
 - Betreiber
 - Versandbevollmächtigter
 - Zusammenfassung
 - Betriebsänderungen
- Anlage
 - Ansprechpartner (1)
 - Produktion (Elektrische Energie)
 - Produktion (Thermische Energie)
- Messgeräte
 - Messgerät (Track scales manufacture)
 - Messgerät (Turbine meter manufacturer)
 - Messgerät (Draft survey)
 - Messgerät (Truck scale manufacturer)
- Analyseverfahren
 - Analyseverfahren (Bomb calorimeter)
 - Analyseverfahren (Radmacher-Hoverat)
 - Analyseverfahren (Process gas chrom)

Überwachungsplan nach § 6 TEHG

Angaben zur Anlage

Name des Betreibers
Heater Corporation

Name der Anlage
CHP Station Helen Heater

Bundesland
Rheinland-Pfalz

Nummer der Betriebseinrichtung
[Federal State]-[No.]

Angaben zum Überwachungsplan

Hat die Anlage ein DEHSt-Aktenzeichen?
 ja nein

DEHSt-Aktenzeichen
14310-0000

Überwachungsplan ist gültig ab
01.01.2013

Werden CO₂-Emissionen überwacht?
 ja nein

Werden N₂O-Emissionen überwacht?
 ja nein

Prüfung

Deckblatt
→ Ein Wert ist erforderlich.

Betriebsänderungen
→ Ein Wert ist erforderlich.
→ Ein Wert ist erforderlich.

Example of an Emissions Report made by an Operator

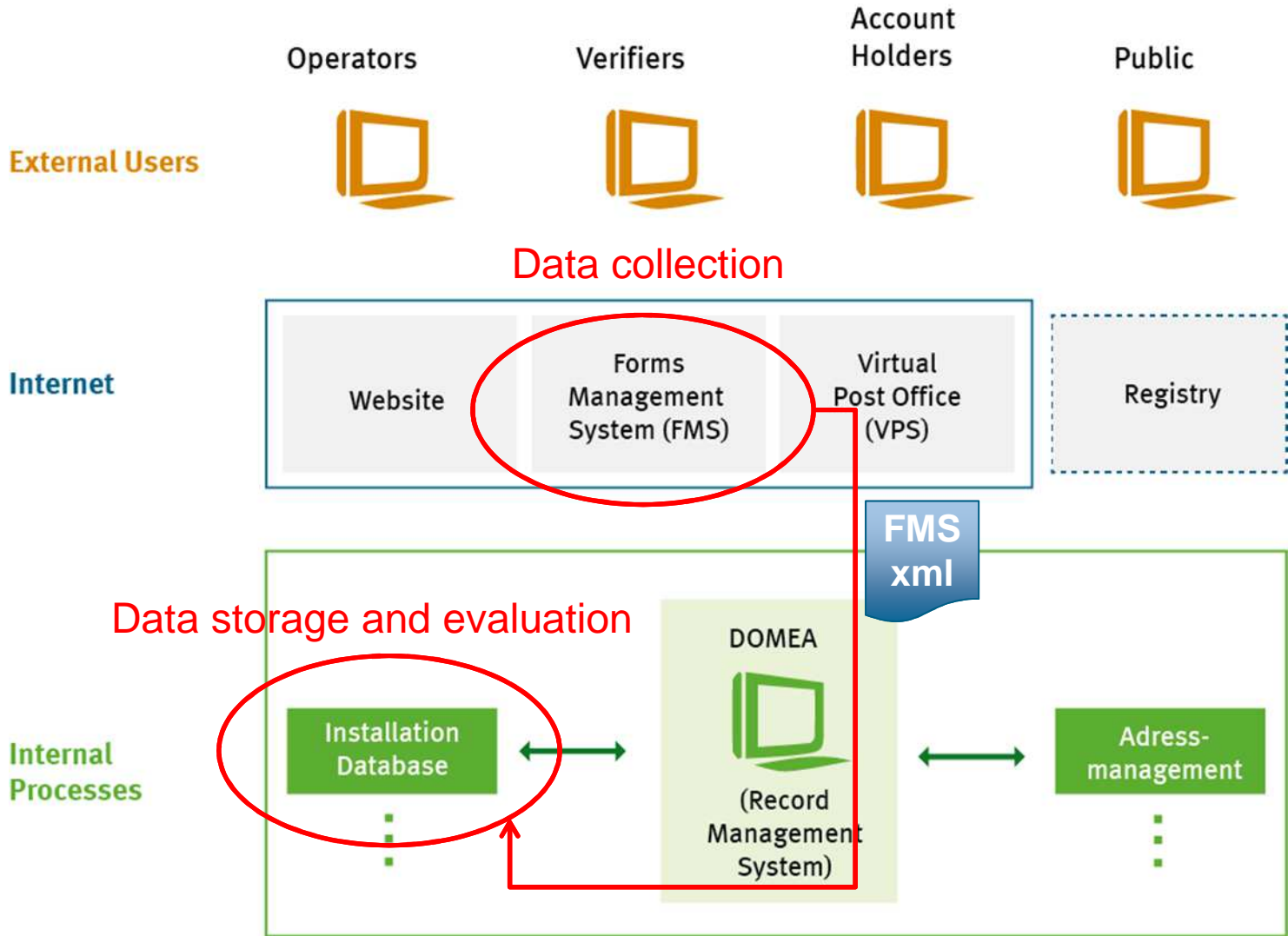
FUEL STREAM (EMISSION FACTOR RELATED TO CALORIFIC VALUE)			
Is there any deviation from the tier of the Monitoring Guidelines (target-tier)?	No.		
Consumed fuel			
Quantity	121,547.5 t		
Tiers according to the Monitoring Guidelines (target-tier)	4		
Tiers according to the monitoring plan (chosen tier)	4		
Net calorific value			
Value	28,3380	GJ/t	Default value 28.3000
Tiers according to the Monitoring Guidelines (target-tier)	3		
Tiers according to the monitoring plan (chosen tier)	3		
Emission factor			
Value	0.0925	t/GJ	Default value 0.0930
Biomass percentage	00 %		
Tiers according to the Monitoring Guidelines (target-tier)	3		
Tiers according to the monitoring plan (chosen tier)	3		
Oxidation factor	1.0		
CO₂-emissions			
	318608.208 t CO ₂		
The material data is ...	X	appropriate.	not appropriate.
The information about the tiers is...	X	appropriate.	not appropriate.
The report was carried out according to the chosen tier?	X	Yes.	No.

FMS guides the Operator through the Application

- Set of forms plus some special selectable forms depending on the type of installation
 - Guides the operator through the system
 - Helps to give all obligatory information
- Automated checks and information on missing or implausible data (forms with missing data are written in red letters)
 - Helps to give all obligatory and plausible information
- Operator and verifier have different access rights
 - Both work on the same data set, but with different write protection
 - No transfer of data necessary

Data Evaluation: Installation of Data Base (ADB)

IT-Structure DEHSt



ADB is a helpful Tool for Data Evaluation

- Internal administration of all installations
- Used for different processes, e.g. checking monitoring plans, validation/checking of emissions reports, calculation of allocation
- Offers functions for checking data consistency, completeness and plausibility
 - Statistical analysis (e.g. source stream parameters)

ADB is a helpful Tool for Data Evaluation

Vorgänge zum Aktenzeichen

Aktenzeichen:
 Betreiber:
 Anlagenbezeichnung:
 Bearbeiter:

- 2020 Emissionsberichte
 - Emissionsbericht 2014, VNr. 135
 - Arbeitsversion (abgeschlossen (Sb.), Emissionsbericht
 - Kraftwerk
 - CO2, Kraftwerk**
 - Zwischenversionen
 - Emissionsbericht 2013, VNr. 130
 - 2020 Überwachungspläne
 - 2020 Mitteilungen zum Betrieb
 - 2020 Ausgangszuteilung

Stoffströme

Prüfen

Herkunft	Stoff (Katalog)	Menge	Einh.	Emissionen [t CO2]	Stoff Nr.	Klassifizierung	Fehler
Verbrennung	Rohbraunkohle	750.889	t	677.432,833	B1	emissionsstark	○○○
Verbrennung	Trockenbraunkohle	2.214,9	t	4.845,593	B5	emissionsschwach	○○○
Verbrennung	Heizöl schwer	5,246	t	16.763,855	B2	De-Minimis	○○○
Verbrennung	HEL	10,8	t	34,092	B6-	De-Minimis	○○○

Parameter Bezug

Parameter				Angaben zu Abweichungen	
Name	Wert	Einh.	Ermittlungsmethode	Parameter	Erläuterung
Menge	750.889	t			
EF	0,1128	t/GJ	Analyse		
Hu	7,998	GJ/t	Analyse		
Biogener Anteil	0	% C			
Nachh. Biom.	0	% C			
OxF	1	[1]			
CO2 (FMS)	677.432,833	t			

„ADB“ is the German abbreviation for installation data base.

Automated Checks are implemented in the ADB




- Automated checks of data plausibility (e.g. in the emissions report)
 - Comparing data from different years
 - Comparing data of similar installations

→ Very useful assistance for our daily work!

→ But: **Database can only check single data!**

Some checks are only possible with technical understanding of the installations/manpower (e.g. completeness of the source streams)

ADB has Automated Checks to support the person in charge of reviewing the installation

Übersicht Probleme		Prüfmodul und Ausführungen				
Zeile: <input type="text" value="1"/> von: <input type="text" value="7"/>		<input type="button" value="Speichern"/> <input type="button" value="Abbrechen"/>				
		Manuell (Sb.)	FM-Nummer	Elementname	Prüfergebnis	Kommentar Sb.
▪		<input type="checkbox"/>	PM207_CHK_001_b		Für den Stoffstrom „Ersatzwert für Flüssigbrennstoff“ mit der Nummer 6 ist der Berechnungsparameter EF mit dem Wert 0,26006 außerhalb des festgelegten zulässigen Bereichs (0,0 bis 0,25).	
▪		<input type="checkbox"/>	PM208_CHK_005		Für den Stoffstrom „Heizöl EL nach DIN 51603, Teil 1“ mit der Nummer 1 und der Bezeichnung „Heizöl EL“ wurde angegeben, dass es sich um einen De-Minimis-Stoffstrom handelt. Die aus diesem Stoffstrom resultierenden Emissionen übersteigen aber die für diese Anlage maßgebliche Obergrenze.	
▪		<input type="checkbox"/>	PM205_CHK_002		Der im FMS technisch zugrunde gelegte Überwachungsplan sowie die ggf. weiteren angewandten Überwachungspläne (siehe Reiter „Angaben aus EmB“) liegen nicht in der ADB vor oder sind nicht für das Berichtsjahr 2015 gültig. (Ggf. liegt ein Überwachungsplan in einer Zwischenversion vor, mit Status „Antrag abgelehnt“.)	

Assistance for Operators

Assistance for Operators by DEHSt

- Guidelines for Creating a Monitoring Plan and an Emissions Report
- Tools as assistance for Creating a Monitoring Plan e.g.
 - for Calculating the Minimum Analysis Frequency
 - Example of a Sampling Plan
 - Example of a Monitoring Plan
 - Presentations held by DEHSt-Staff
- Guidelines for obligatory Software (Form-Management-System, Virtual Post Office,...)
- Customer Service (Requests via e-mail or phone)

Assistance for Operators by EU KOM

- Templates for e.g. ...
 - Creating a Monitoring Plan
 - Determining Unreasonable Costs
 - Assessing Monitoring Plans by Competent Authority or Operator
- Guidances for e.g. ...
 - General Aspects of Monitoring Plans
 - Uncertainty Assessment of Measuring Devices
 - Sampling and Analysis
- Relevant Homepage of EU KOM:
https://ec.europa.eu/clima/policies/ets/monitoring_en#tab-0-1

Thank you for your attention!

Delia Fahle

Rebeca Sahagún Martínez

E-Mail: emissionstrading@dehst.de

Internet: www.dehst.de

This presentation is based on a speech held by the German Emissions Trading Authority (DEHSt) and is not clear for publication. Check against delivery. References and quotations from the presentation must at all times be approved in written form by the DEHSt.

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