

Capacity Building for the Implementation of the EU Emissions Trading Directive in the new EU Member States

**Workshop
Brno, 7th – 8th November 2005**

Guide on Monitoring and Reporting

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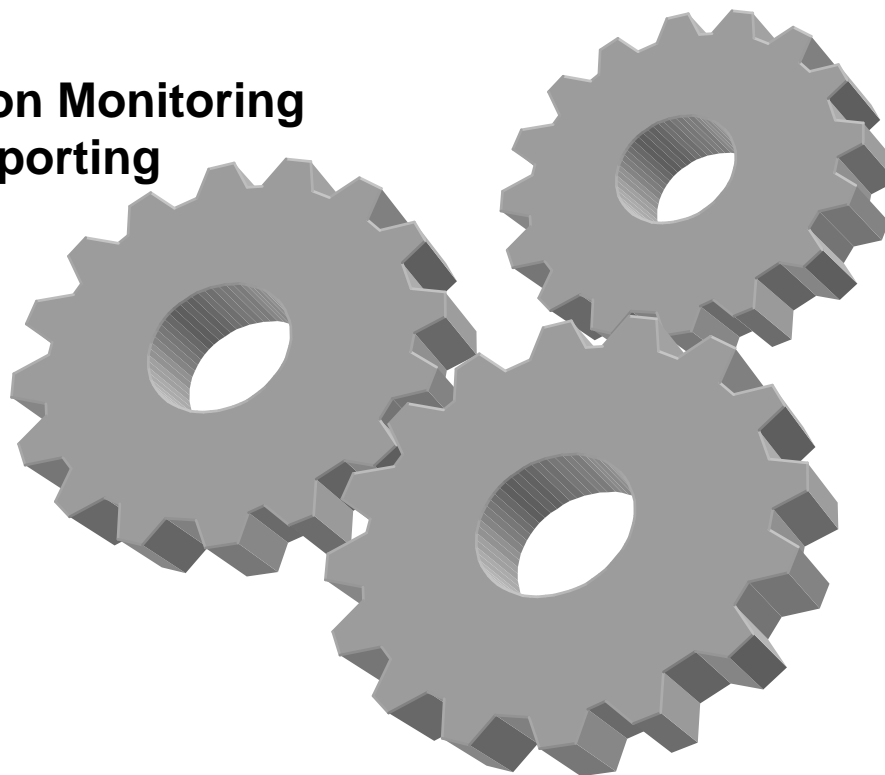
■ Content

1. **Scope of the Manuals**
2. **Manual No.1: Guide on Monitoring and Reporting**
3. **Manual No.2: Guide on Verification**
4. **Summary and Conclusion**



■ Interrelationship between Manuals

**Guide on Monitoring
and Reporting**

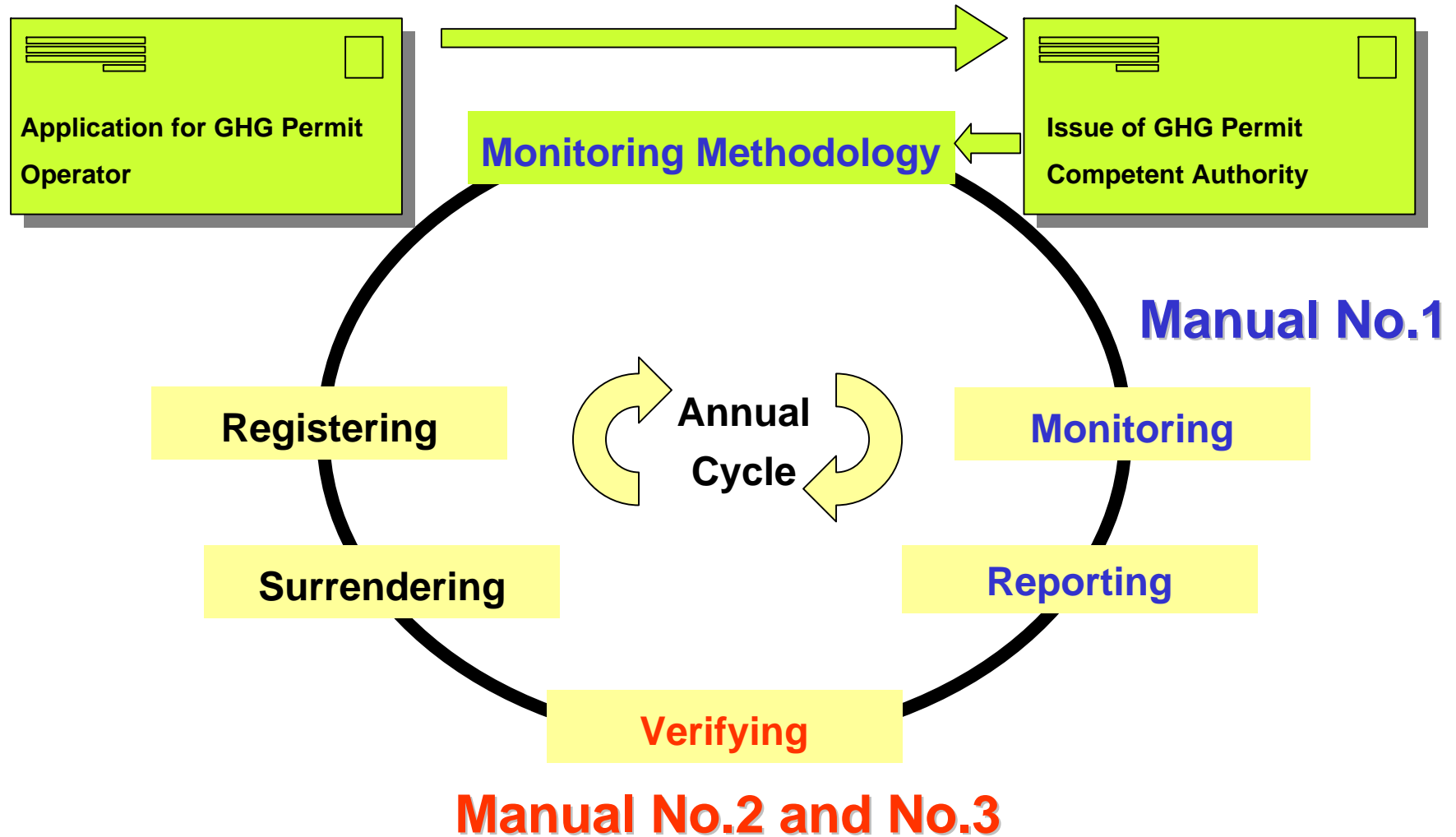


Guide on Accreditation

Guide on Verification



■ Scope of the Manuals



■ GHG Permit

Member States shall ...

... assure that from 1 January 2005 no installation covered by the EU ETS undertakes any activity unless its operator holds a GHG permit (*Article 4*)

Application for GHG Permit shall ...

... include measures planned to monitor and report emissions in accordance with the MRG (*Article 5*)

GHG Permit shall ...

... contain monitoring requirements, specifying monitoring methodology and frequency (*Article 6*)

(1) Theory not practise

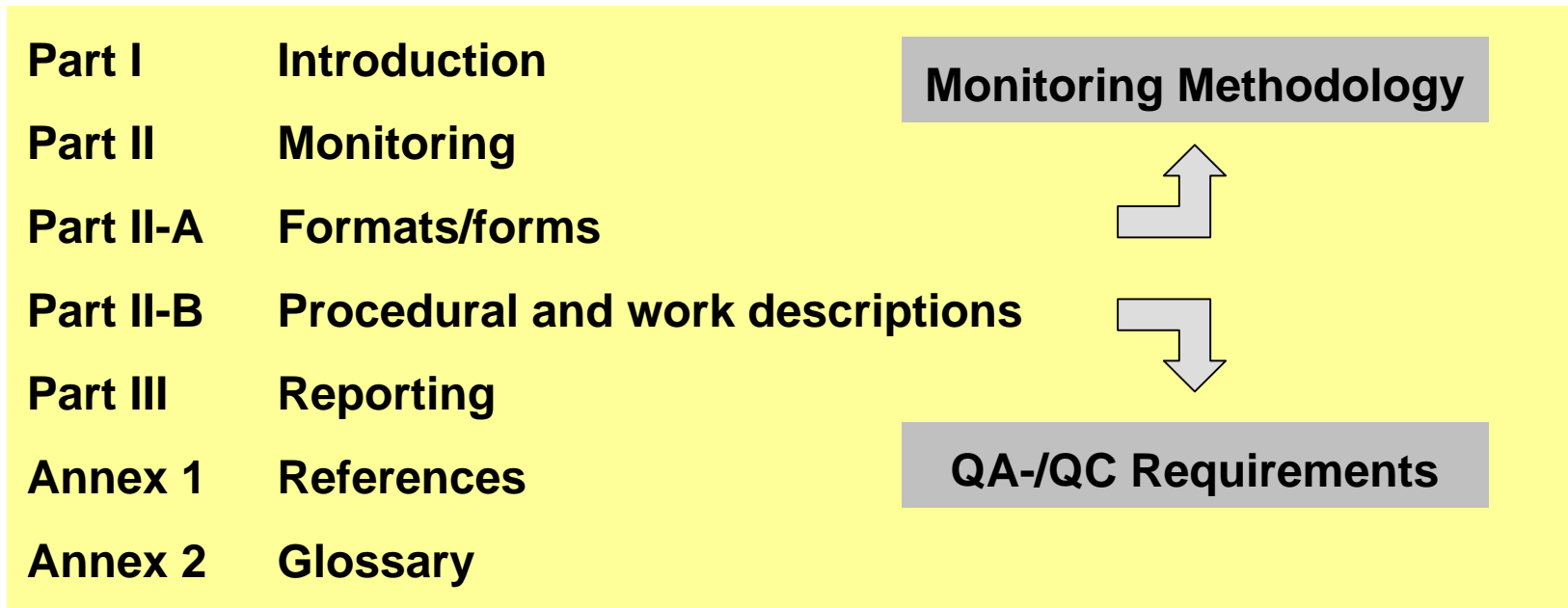
(2) Practise differs from MS to MS and within MS

■ Content

1. **Scope of the Manuals**
2. **Manual No.1: Guide on Monitoring and Reporting**
 - **Case Study**
 - **Formats / Forms**
 - **Procedural and Work Descriptions**
4. **Manual No.2: Guide on Verification**
5. **Summary and Conclusion**



■ Structure of Manual No.1



Case Study explains formats/forms and QA-/QC measures!

■ Case Study



- **Power Station**
- **400 MW**
- **2 Sources**
(combustion; flue gas cleaning),
- **3 Streams (linked to sources)**
(coal, timber, limestone)
- **2 Streams (not linked to sources)**
 - (FBA Furnace Bottom Ash and
 - PFA Pulverised Fuel Ash)



■ Formats/forms

Monitoring Methodology

1. Exact definition of the installation and activities
2. Information on responsibilities for M&R
3. List of fuel and material streams
4. List of sources
5. List of tiers
6. Description of the metering devices
7. Description of the sampling of fuel and materials
8. Description of the sources or analytical approaches
9. Description of CEM
10. Description of QA/QC for data management
11. Information on links with EMAS

■ (1) Definition of the Installation and Activities

A. Data of the Installation

- Category of Activity, Activity
- Codes (IPPC, EPER, CRF, NAP)
- Permits (IPPC, ETS)

B. Non-technical Summary of the details of the installation

- e.g. IPPC Permit and add aspects relevant for CO₂-emissions

C. Process flow sheet of the installation

- e.g. IPPC permit and add sources, streams, samplings, metering

D. CO₂ emissions of the installation

- allocated and reported emissions per year

■ Definitions (1)

LEVEL

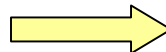
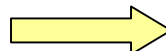
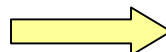
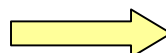
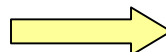
01: **Installation**

02: **Category of Activity**

03: **Activity**

04: **Source**

05: **Streams**



SIMPLE EXAMPLE

Power Plant

Energy Activities

Combustion

Gas Turbine

Natural Gas

INSTALLATIONS

means stationary technical units where one or more activities are carried out

ACTIVITIES

means the activities listed in Annex I of The ETS Directive

SOURCES

means separately identifiable points or processes in an installation from which GHG are emitted

■ Definitions (2)

LEVEL		COMPLEX EXAMPLE
01 Installation	→	Integrated Steel Works
02 Category of Activity	→	Energy Activities, <i>Production and Processing of Ferrous Metals</i>
03 Activity	→	Combustion, Coke Oven, <i>Sintering Installation, Installation for the Production of Steel</i>
04 Source	→	Incineration, Flue Gas Cleaning, <i>(N.N.)</i>
05 Streams	→	Coal, Gas Oil, Limestone, <i>(N.N.)</i>

Define the installation's:

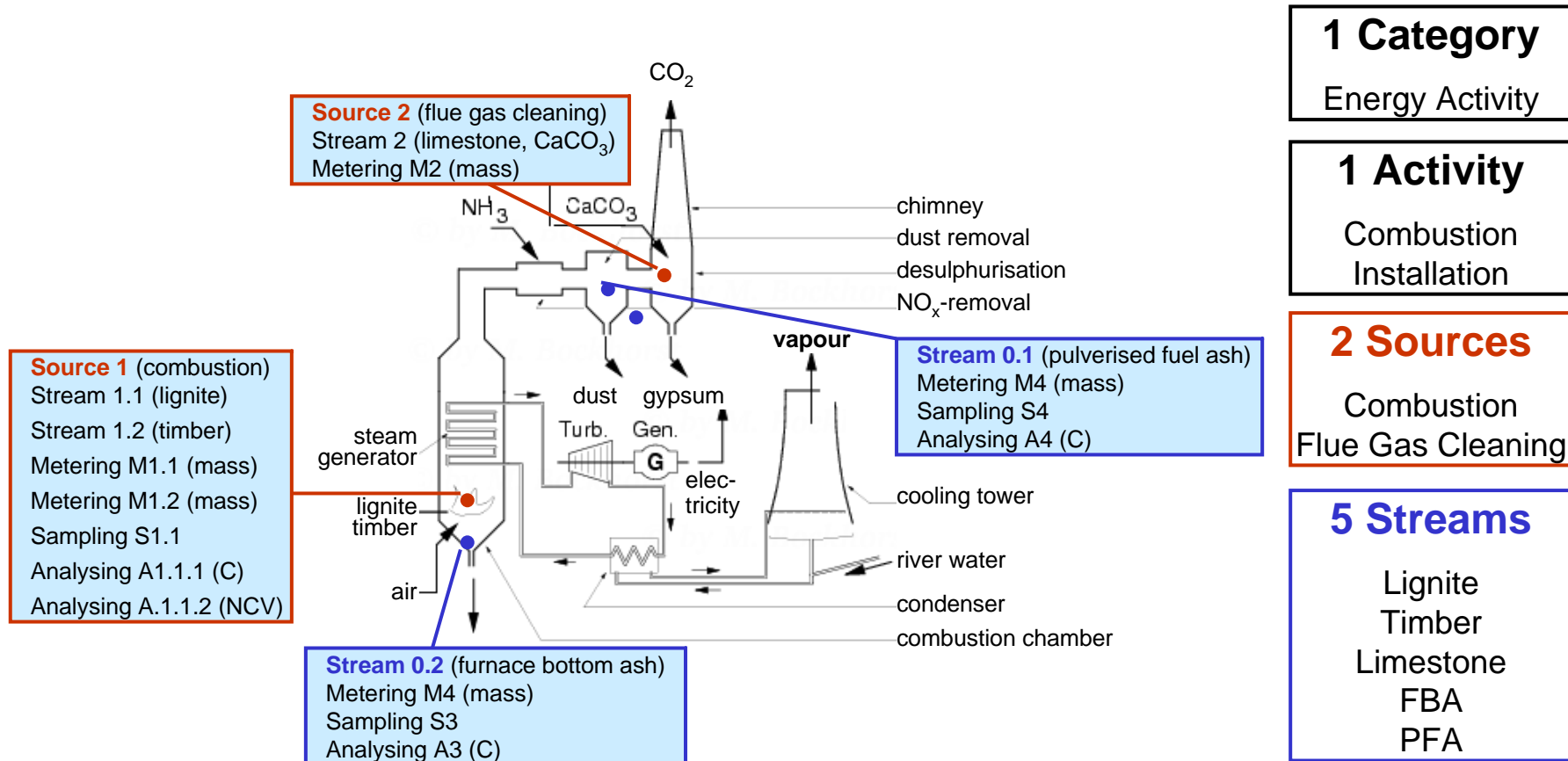
(1) Categories of activity

(2) Activities

(3) Sources

(4) Fuel and material streams

■ Case Study: Condensation Power Plant



■ (3) Fuel and Material Streams

Activity: Combustion Installation								
Total CO ₂ -emissions of the activity including biomass streams					774,618 t CO ₂ /a			
Total CO ₂ -emissions of the activity without biomass streams					709,579 t CO ₂ /a			
Total CO ₂ -emissions of the activity's biomass streams					65,039 t CO ₂ /a			
Code	Name	Amount [t/a]	Biomass [%]	CO ₂ -emissions				
				Amount [t/a]	Origin		Determination	
					Comb.	Process	Calcul.	Measure
1.1	Lignite	824,666	0	701,867	x		x	
1.2	Timber	39,543	100	65,039	x		x	
2.1	Limestone	17,540	0	7,712		x	x	
0.1	Ash (FBA)	7,020	0	Output streams with no impact on CO ₂ -emissions but on the oxidation factor of fuel stream 1.1				
0.2	Ash (PFA)	28,074	0					


■ (4) Sources

Activity: Combustion Installation							
Total CO ₂ -emissions of the activity including biomass streams						774,618 t CO ₂ /a	
Total CO ₂ -emissions of the activity without biomass streams						709,579 t CO ₂ /a	
Total CO ₂ -emissions of the activity's biomass streams						65,039 t CO ₂ /a	
Sources			Streams (of fuel and material)				
Code	Name	CO ₂ without biomass	Code	Name	Amount [t/a]	CO ₂ -emissions	
						[t CO ₂ /a]	Biomass
1	combustion	701,867	1.1	lignite	824,666	701,867	No
			1.2	timber	39,543	65,039	Yes
2	flue gas cleaning	7,712	2.1	limestone	17,540	7,712	No

■ (5a) Tier Approach - Preparations

Table I of Annex I of the MRG:

Columns A, B and C contain tier values of **major sources!**

	increasing magnitude 		
Object	Class 1	Class 2	Class 3
Installation	A	B	C
Stream	de minimis	minor	major
Source	de minimis	minor	major

Major sources including major streams of fuels and material are those, which, if ranked in the order of their decreasing magnitude, cumulatively contribute at least 95% of the total annual emissions of the installation.

■ (5b) Thresholds for Classification

Column	Total annual emissions of the installation
A	emissions \leq 50,000 t/a
B	50,000 t/a < emissions \leq 500,000 t/a
C	emissions > 500,000 t/a

Installation: [as indicated in Data of the Installation]		
Total annual CO ₂ -emissions of the installation (without biomass)	Threshold for minor streams (sources)	Threshold for „de-minimis“ streams (sources)
\leq 50,000 t CO ₂ /a	2,500 t CO ₂ /a	500 t CO ₂ /a
> 50,000 t/a	5% i.e. > 2,500 t CO ₂ /a	1% i.e.> 500 t CO ₂ /a

■ (5c) “de minimis”, Minor, Major Streams (Sources)

Installation: Condensation Power Station [709,579 t CO₂/a]		
Total annual CO₂-emissions of the installation (without biomass)	Threshold for minor streams (sources)	Threshold for „de-minimis“ streams (sources)
> 50,000 t/a	5% i.e. > 2,500 t CO₂/a	1% i.e.> 500 t CO₂/a
709,579 t CO₂/a	35,479 t CO₂/a	7,096 t CO₂/a

■ (5d) de minimis, Minor, Major Streams (Sources)

Installation: Power Station 709,597 t CO ₂ /a			CO ₂ -emissions		
MAJOR	Streams		Amount [t CO ₂ /a]	% of total emissions	Σ(% of total emissions)
	No.	Name			
MAJOR	1.1	Lignite	701,867	98.9	98.9
	Go to MINOR if sum of percentages is ≥ 95%				
	Go to DE MINIMIS if sum of percentages is ≥ 99%				
MINOR	2.1	Limestone	7,712	1.1	100
	Go to DE MINIMIS if sum of percentages is ≥ 99%				
DE MINIMIS	-	-	-	-	100
	Sum of percentages must be in the last line 100%				

- (1) Stream 1.1 is a major stream and source 1 is a major source!**
- (2) Stream 2.1 is a minor stream and source 2 is a minor source!**
- (3) No “de minimis” stream (source)!**

■ (5e) Tier Approaches for Major Sources

Total emissions of the installation [t CO ₂ /a]				Category (accord. Table 1, Annex 1, MRG)
Excl. biomass emissions *		709,579	A: emissions* ≤ 50 kt/a []	
Incl. biomass emissions		774,618	B: 50 kt/a < emissions* ≤ 500 kt/a []	
Biomass emissions		65,039	C: emissions* > 500 kt/a [X]	
Code of the activity: n.a. (only one activity)				Name of the activity: combustion installation
Code of the source: 1				Name of the source: combustion
Code of the stream: 1.1				Name of the stream: lignite
	Req. tier	Sel. tier	Values and units	Statement concerning any non-conformity between required and selected tier!
Activity data	3a/3b	3a	824,666 t/a	
Net calorific value	3	3	8,41 TJ/kt	
Emission factor	3	3	101,2 tCO ₂ /TJ	
Composition data	n.a.	n.a.	-	
Oxidation factor	2	2	0,99	
Conversion factor	n.a.	n.a.	-	

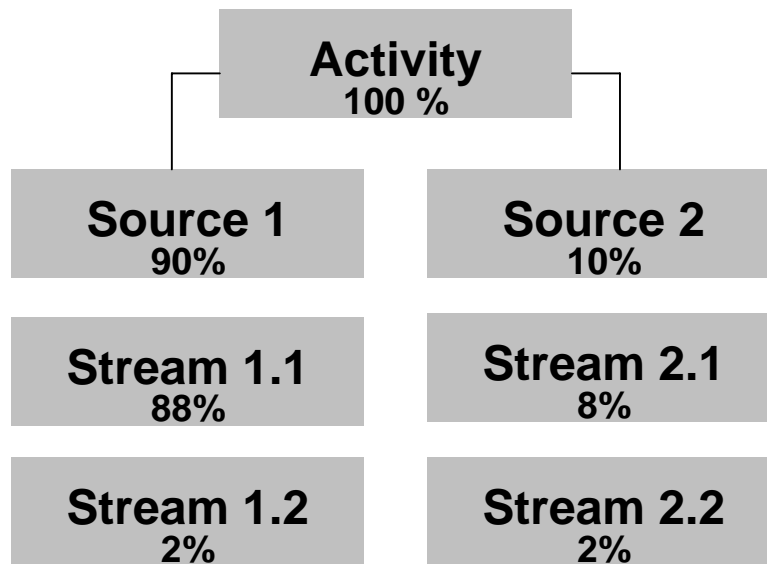
■ (5f) Tier Approaches for Major Sources

Total emissions of the installation [t CO ₂ /a]				Category (accord. Table 1, Annex 1, MRG)
Excl. biomass emissions *		709,579	A: emissions* ≤ 50 kt/a	[]
Incl. biomass emissions		774,618	B: 50 kt/a < emissions* ≤ 500 kt/a	[]
Biomass emissions		65,039	C: emissions* > 500 kt/a	[X]
Code of the activity: n.a. (only one activity)				Name of the activity: combustion installation
Code of the source: 1				Name of the source: combustion
Code of the stream: 1.2				Name of the stream: timber
	Req. tier	Sel. tier	Values and units	Statement concerning any non-conformity between required and selected tier!
Activity data	n.a.	2b	39,543 t/a	Fuel stream 1.2 is a pure biomass stream with no tier requirements.
Net calorific value	n.a.	1	15.3 TJ/kt	
Emission factor	n.a.	1	107,5 tCO ₂ /TJ	For memo item calculation only!
Composition data	n.a.	n.a.	-	
Oxidation factor	n.a.	1	0,99	
Conversion factor	n.a.	n.a.	-	

■ (5g) Sources versus Streams

Table I of Annex I of the MRG:

Columns A, B and C contain tier values of **major sources!**



... are those, which, if ranked in the order of their decreasing magnitude, cumulatively contribute at least 95% of the total annual emissions of the installation.

(1) Source 1 and 2 are major sources and Table I contains mandatory tier values!

(2) Streams 1.2 and 2.2 are minor streams!

■ Formats/forms

Monitoring Methodology

1. **Exact definition of the installation and activities** ✓
2. **Information on responsibilities for M&R**
3. **List of fuel and material streams** ✓
4. **List of sources** ✓
5. **List of tiers** ✓
6. **Description of the metering devices**
7. **Description of the sampling of fuel and materials**
8. **Description of the sources or analytical approaches**
9. **Description of CEM**
10. **Description of QA/QC for data management** ⇒ **Procedural and Work Descriptions**
11. **Information on links with EMAS**

■ Procedural and Work Descriptions

Quality Assurance, Quality Control and Data Management

1. Identification of greenhouse gas sources
2. Sequence and interaction of monitoring & reporting procedures
3. Responsibilities and competence
4. Methods of calculation or measurement
5. Measuring equipment
6. Reporting and records
7. Internal review
8. Corrective and preventive action



■ WD 2: Sequence, Interaction of M&R-Procedures

- **Monitoring requirements**
GHG permit and monitoring methodology
- **Determination of CO₂ emission for each source**
Metering, sampling, analysing, responsibilities and qualification
- **First line check by operator**
Complete, plausible, transparent
- **Determination of CO₂ emissions**
Measurement or calculation, tier approach
- **Preparing the annual emission report**
National requirements
- **Verification of the annual emission report**
Accredited verifier, scope competence
- **Submission of the annual emission report**
Dead line March 31st, national requirements

■ Reporting

ETS Directive no special reporting format required

MRG special reporting formats required
(shall be used as basis)

UK Form ETS7 for Annual Monitoring Report
(*Form ETS2 for Monitoring Plan*)

Germany Electronic reporting procedure with integrated
verification report / statement

(1) Member State specific reporting formats and procedures!

(2) No recommendation is given in Guide on Monitoring & Reporting!

■ References

- **DEFRA / SEPA (May 2004)**
Competent Authority Guide to the Commission Decision establishing Guidelines for Monitoring and Reporting in accordance with the EU ETS
- **DEFRA / SEPA (June 2004)**
Example for the Completion of Monitoring and Reporting Plan Template
 - coal fired power station
 - oil fired power station
 - iron and Steel
 - glass
 - gas fired power station
 - small scale combustion
 - cement
 - pulp and paper
- **DEHST (January 2005)**
Monitoringkonzept (in German)
- **DEFRA / SEPA (August 2005)**
EU ETS – Annual Emission Report
Guidance to Operators for the Completion of Form ETS 7

■ Content

1. **Scope of the Manuals**
2. **Definition of Key Terms**
3. **Manual No.1: Guide on Monitoring and Reporting**
4. **Manual No.2: Guide on Verification**
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■ Structure of Manual No.2

Part I	Introduction
Part II	Verification process
Part II-A	Verification requirements based on ETS Directive
Part II-B	Verification requirements based on MRG
Part III	Verification report and verification statement
Annex 1	References
Annex 2	Glossary



■ Verification Requirements (ETS Directive)

Strategic Analysis

- Basis for verification, overview of all the activities and their significance for emissions

Process Analysis

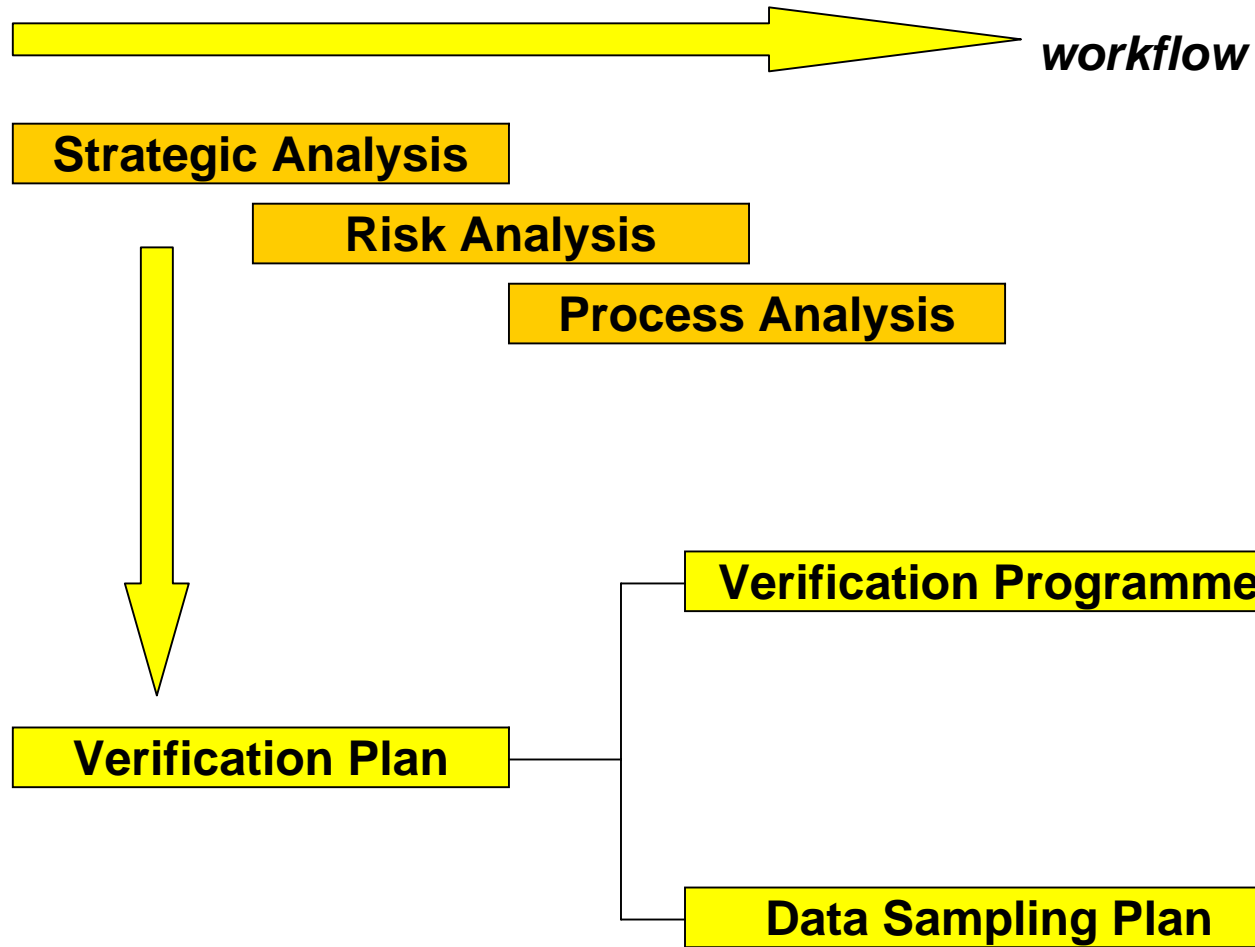
- Site visit and spot-checks to determine the reliability of the reported data and information

Risk Analysis

- Evaluation of the data of each source regarding reliability
- Identification of those sources with a high risk of error
- Consideration any effective risk control methods applied by the operator



■ Verification Process (MRG)



■ Strategic Analysis

Complexity of the installation

- Categories of activities, activities, sources and streams?
- Calculation or measurement?

Operational structure, especially data management system

- What kind of (and how many) sampling, analysing, metering?
- What kind of data collection, processing and archiving?

Organizational structure, especially responsibilities

- Who is operator and “CO₂ manager”?
- What kind of responsibilities are delegated and to whom?

QA-/QS-measures

- Handbook, procedural descriptions, work descriptions?
- Stand alone system or integrated system (QMS, EMS)?

■ Process Analysis

Site visit

- site of the installation (compliance audit)
- installation's head office (if data are processed there)
- other locations (e.g. supplier)

Confirm/check, whether

- monitoring and reporting complies with GHG permit,
- data management is effective,
- QA-/QC-processes are implemented,
- personnel is aware of responsibilities and duties,
- physical meters are in line with and maintenance plan/system,
- no essential changes have occurred,
- abnormal operations are handled clearly (e.g. repairs)

■ Verification Requirements (MRG)

1. Understanding of activities
2. Understanding of data management systems
3. Establishing an acceptable material level
4. Analysing the data risks
5. Drawing up a verification plan
6. Carrying out a verification plan
7. Checking the accuracy level
8. Request to provide missing data and/or to revise calculation

Strategic A.
Process A.
Strategic A.
Risk A.
Strategic A.
Process A.
Risk A.
Strategic, Process, Risk A.



■ Verification Report and Statement

LEGAL REQUIREMENTS

1. Validation / verification report

The verifier shall prepare a report on the validation process stating whether the annual emission report is satisfactory.

(ETS Directive)

2. Verification / validation judgement

At the end of the verification process, the verifier shall make a judgement with respect to whether the emissions report contains any material misstatement.

(MRG)



■ Verification Judgement or Statement

Verified without comments

- no material errors, omissions and misstatements
- monitoring and reporting in accordance with the GHG permit
- any inconsistencies have been resolved and are no longer an issue

Verified with comments

- non-conformities with the GHG permit have been detected, that
 - could be resolved by the operator and/or
 - have not caused material errors, omissions and misstatements

Not verified

- non-conformities with the GHG permit have been detected, that
 - could not be resolved by the operator and
 - have caused material errors, omissions and misstatements

■ References

- **DEFRA** (*August 2005*)
**EU Emissions Trading Scheme
Guidance on Annual Verification**
- **IETA** (*September 2005*)
Verification Protocol, version 2.0 (2005)
**Verification of Annual Emission Reports of installations engaged in
EU emission trading**

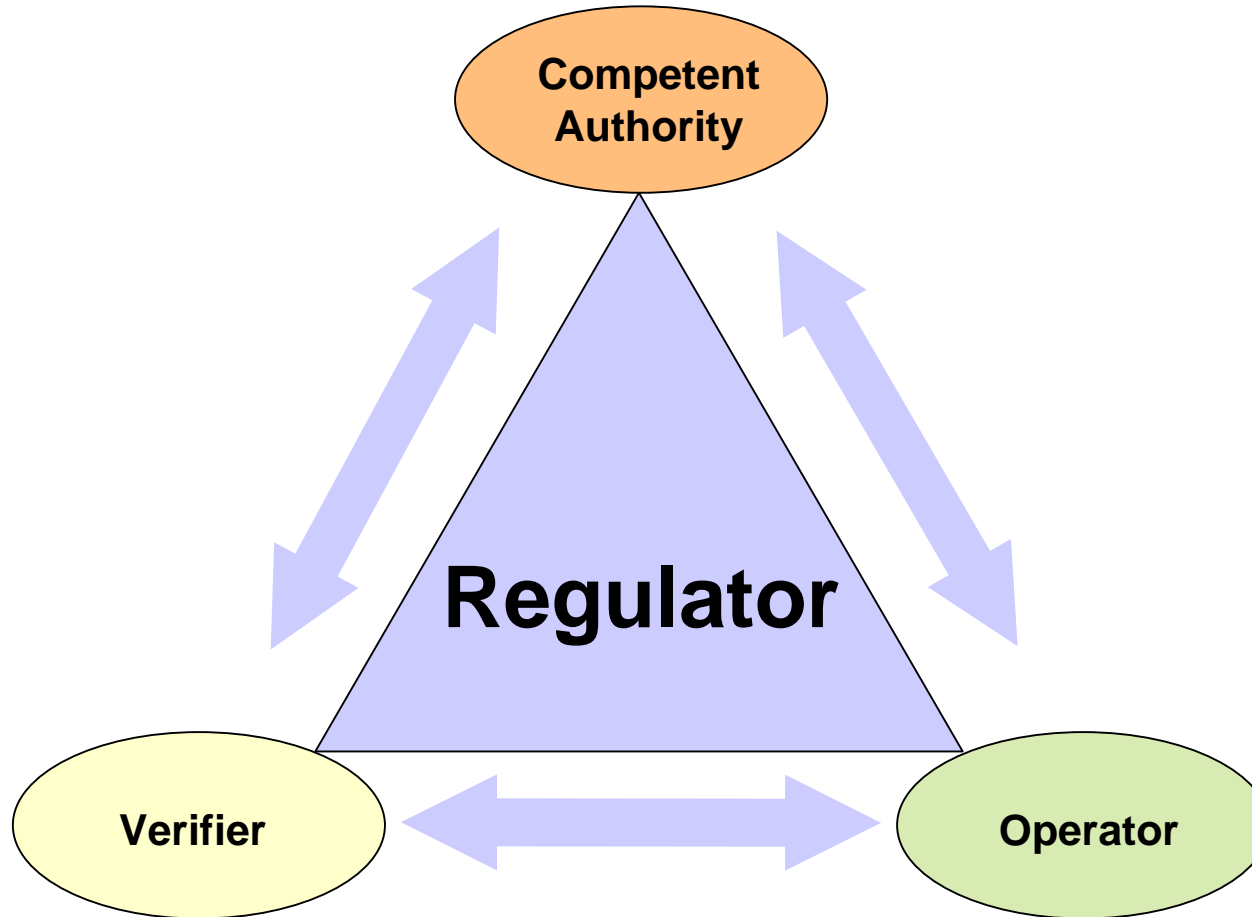


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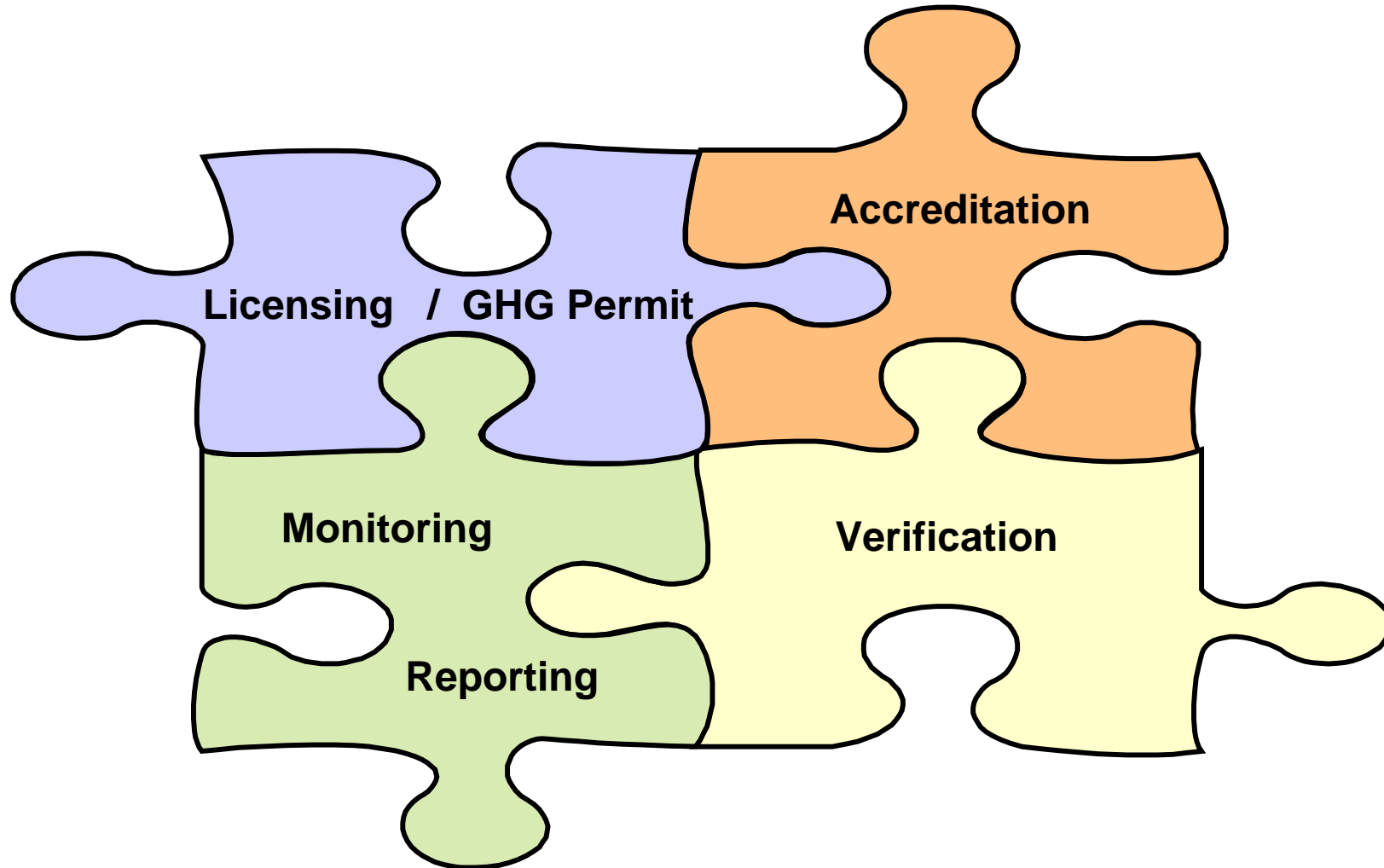
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■ Key Actors



■ Key Processes



■ Selected TÜV Expertise in Emissions Trading

2002 – 2003

Development of draft MRG

2004 – 2006

Support to the Commission's Work related to the implementation, evaluation and further development of the MRG

2005 – 2006

Support to the Commission's Work related to the review of the MRG

2004

Verification of application forms for the allocation of EU allowances

2004 – today

Examination for publicly certified verifier for emissions trading

2004 – today

Validation, verification of CDM-projects (*Designated Operational Entity*)

2004 – today

Pre-Determination of JI-projects (*applied for Independent Entity*)

■ **Any Questions? Please contact:**

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