Experiences with a National GHG Inventory System

Federal Environment Agency Austria
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May 2001

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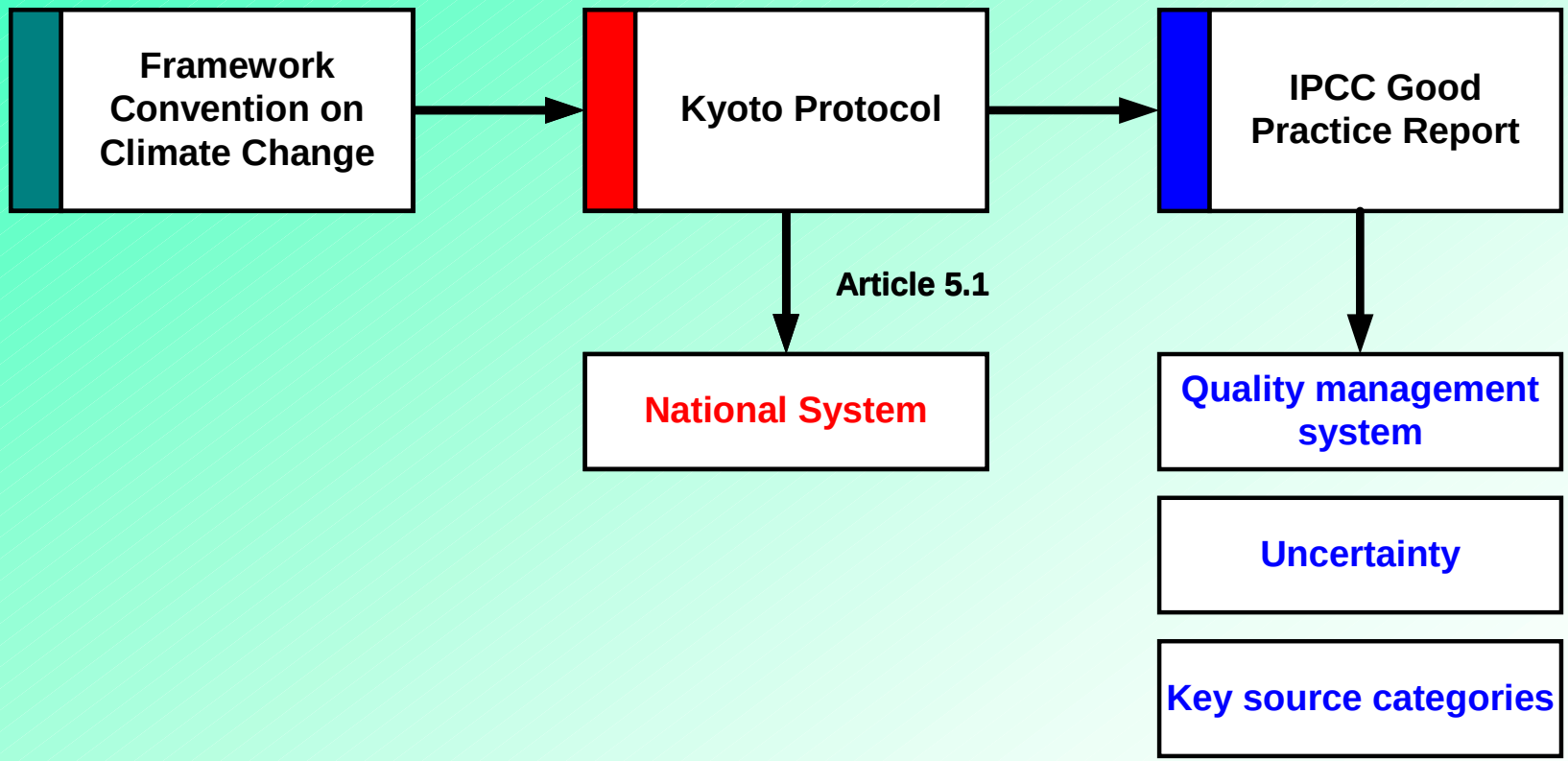
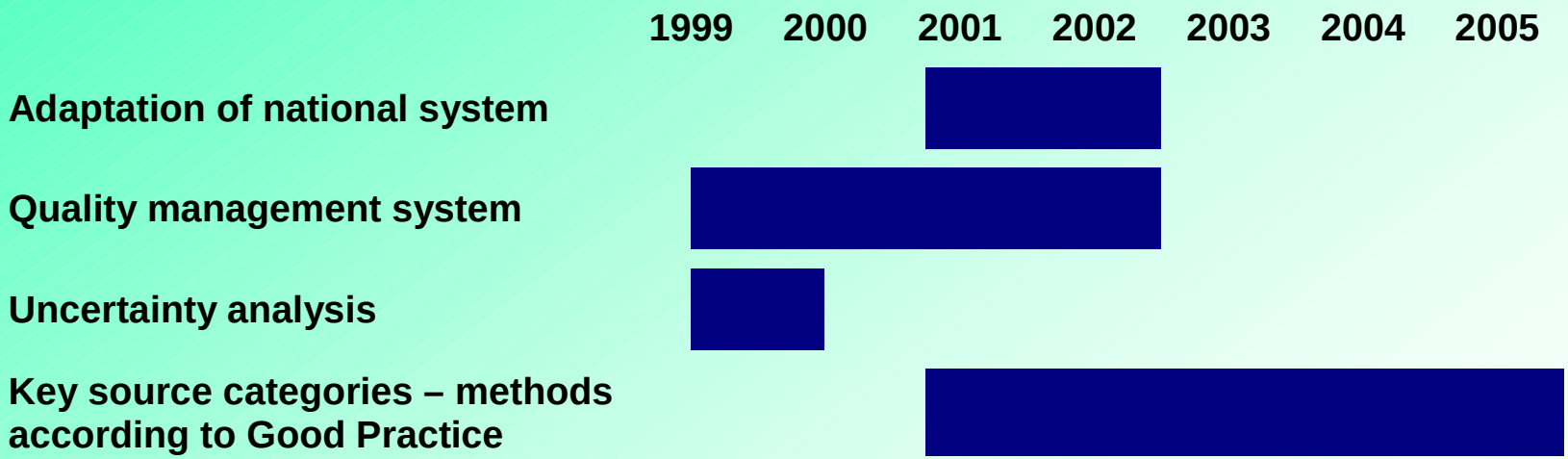
Introduction (1)



Introduction (2)

Timetable for steps to be taken



National system (1)

Current system

International obligations:

- UNFCCC / Kyoto Protocol
- UNECE / CLRTAP
- EU CO_2 Monitoring Mechanism
- Austrian Air Quality Protection Act
- EU IPPC Directive / EPER (European PRTR)

➪ **Austrian air emission inventory**

- ➪ **all pollutants**
- ➪ **all emission sources**
- ➪ **all reporting formats**

National system (2)

Adaptation of the national system according to Art. 5.1 Kyoto Protocol

Definition:

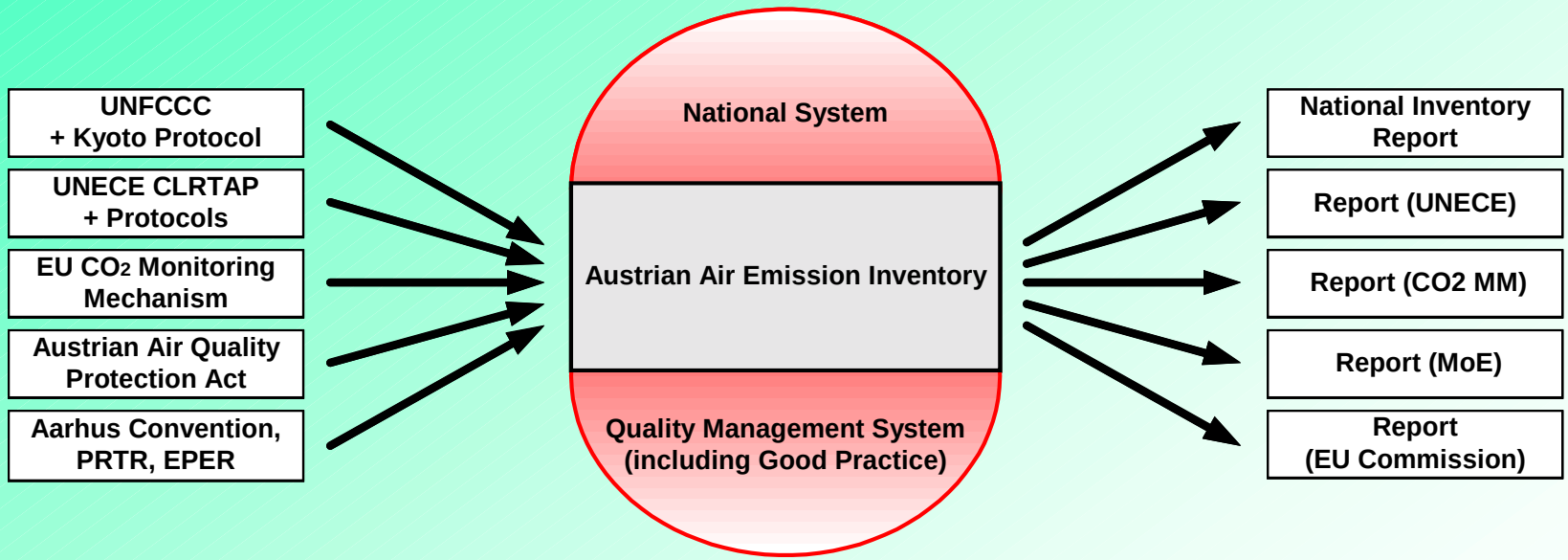
A national system includes all institutional, legal and procedural arrangements ... for estimating anthropogenic emissions ... of all greenhouse gases ... and for reporting and archiving inventory information.

Adaptation:

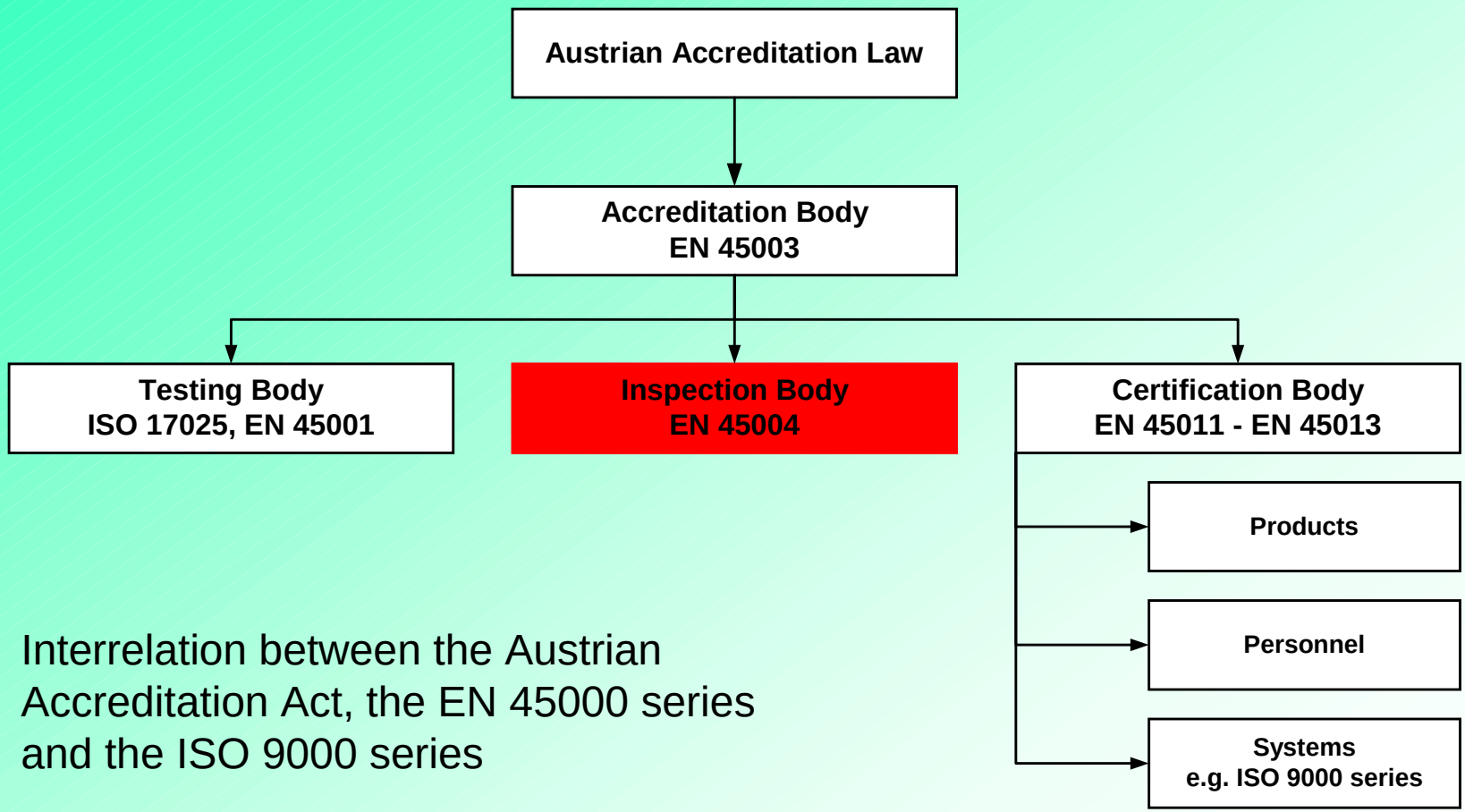
- Intensified collaboration with external institutions
- Adapted processes for compilation of emission inventories → realized by means of QM system

National system (3)

Future system



Quality management system (1)



Interrelation between the Austrian Accreditation Act, the EN 45000 series and the ISO 9000 series

Quality management system (2)

Comparison EN 45000 series - ISO 9000 series

Similar:

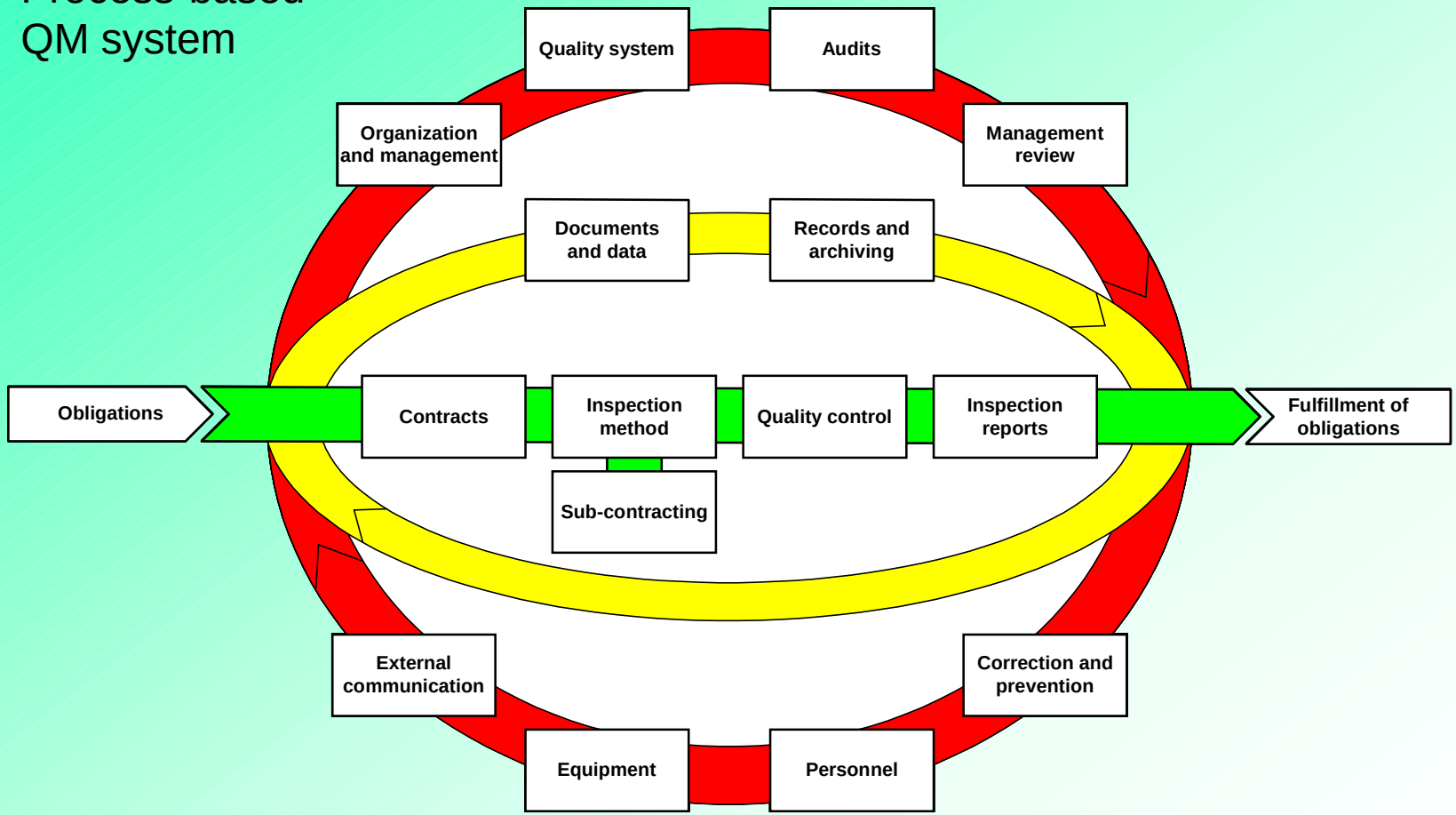
Normative references for a QM system

Further requirements of EN 45000 series:

- Accredited bodies under the EN 45000 series are obliged to strict independence, impartiality and integrity.
- Personnel must be free from any commercial, financial and other pressure.
- External persons or organizations must not influence the results.

Quality management system (3)

Process-based
QM system



Uncertainty analysis (1)

Work

performed by the Austrian Research Centers Seibersdorf

Winiwarter, W.; Rypdal, K.; accepted for publication in Atmospheric Environment, 2001.

Procedure

1. Compilation of emission sources
2. Prioritization and first estimate of uncertainty
3. Uncertainty assessment for input parameters
4. Monte Carlo analysis

Uncertainty analysis (2)

Emission Source	CO_2	CH_4	N_2O
Energy conversion	×		×
Industry	×		
Transport	×		×
Energy – other sources	×		
Fugitive emissions – gas and liquid fuels	×		
Industrial processes – cement	×		
Metal industry processes – iron and steel	×		
Enteric fermentation – cattle		×	
Agricultural soils		×	×
Abandonment of managed lands	×		
Solid waste disposal		×	

Most relevant emission sources with regard to uncertainty

Uncertainty analysis (3)

Total uncertainty		CO_2	CH_4	N_2O	Total GHG emissions
1990	Mean	63,20	9,48	6,59	79,27
	Standard deviation	0,73	2,29	2,95	3,89
	2σ	**2,3%**	**48,3%**	**89,6%**	**9,8%**
1997	Mean	67,76	8,34	6,81	82,91
	Standard deviation	0,71	1,98	2,93	3,67
	2σ	**2,1%**	**47,4%**	**85,9%**	**8,9%**

Random uncertainty		CO_2	CH_4	N_2O	Total GHG emissions
1990	Mean	63,54	11,41	1,99	76,94
	Standard deviation	0,30	1,64	0,26	1,73
	2σ	**1,0%**	**28,7%**	**25,6%**	**4,5%**
1997	Mean	68,05	10,02	2,27	80,34
	Standard deviation	0,34	1,43	0,27	1,53
	2σ	**1,0%**	**28,5%**	**23,9%**	**3,8%**

Results

Key source categories (1)

Method

Good Practice Report, Chapter 7 (Methodological Choice and Recalculation)

- *Tier 1 Level Assessment*

  (emission sources adding up to over 95% of total emissions)
- *Tier 1 Trend Assessment*

  (emission source trend diverging significantly from the total trend)

Key source categories (2)

Emission source	CO_2	CH_4	N_2O	HFC	PFC	SF_6
Energy	13		1			
Industrial Processes	4			1	1	1
Solvent and other product use	1					
Agriculture		2	1			
Land-use change and forestry						
Waste		2				

Number of key source sub-categories based on emission data for 1999

➪ These key source categories account for 96% of total greenhouse gas emissions.

Conclusions

- On legal authority, the Federal Environment Agency Austria prepares the professional base for all international reporting obligations regarding air emissions.
- The Federal Environment Agency Austria takes all steps in order to be prepared that the Kyoto Protocol enters into force as scheduled.
- The following steps are being taken:
  - Adaptation of the national system
  - Quality management system and accreditation
  - Uncertainty analysis
  - Key sources

  → Emission inventory improvement program