MRV Program Design Elements

Partnership for Market Readiness

MRV Training Workshop

Beijing, China

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Contents

- Overview of the design elements
- Presentations from experts:
  - China
  - USA
  - EU
  - Kazakhstan
- Summary and Q&A

Program Design Elements

- There are various design elements which must be considered for MRV programs
  - Principles and objectives
  - Institutional arrangements
  - Coverage
  - Monitoring & calculation methodology
  - Reporting requirements and compliance cycles
  - Data Quality Control and Quality Assurance
  - Data disclosure and presentation

- We will explore these design elements in this overview and then use practical examples to look at them in more detail

Principles

- Which principles are important and why?
  - Relevance
  - Completeness
  - Consistency
  - Transparency
  - Accuracy
- How do the principles influence the design of the MRV program?
  - Conservative vs accurate

- Which objectives are relevant for you?
  - **Value**: What will the program provide for the costs of implementation and ongoing operation? How are the costs shared between the reporting entities and the government authorities?
  - **Quality**: What aspects of quality are important? How does quality drive the program's integrity?
  - **Practicality**: How important is it for the program's requirements for reporting entities to be practical, reasonable and clear?

Institutional Arrangements

- Who is going to administer the program?
  - Is it an existing group or a new institution?
  - What authority do they have over facilities?
- Is there also a policy-maker who makes decisions relevant to the program?
- For the administrator of the MRV program:
  - What capabilities are required?
  - How many people are required?
  - Which other entities/groups/agencies do they need to interact with?

- What are the enforcement processes for non-compliance by reporting entities?
  - Does the program administrator or an existing enforcement agency manage non-compliance and enforcement processes?
- Does non-compliance with MRV program requirements also trigger other penalties or enforcement actions?
  - Are reporting requirements linked to operating permits or other environmental approvals?

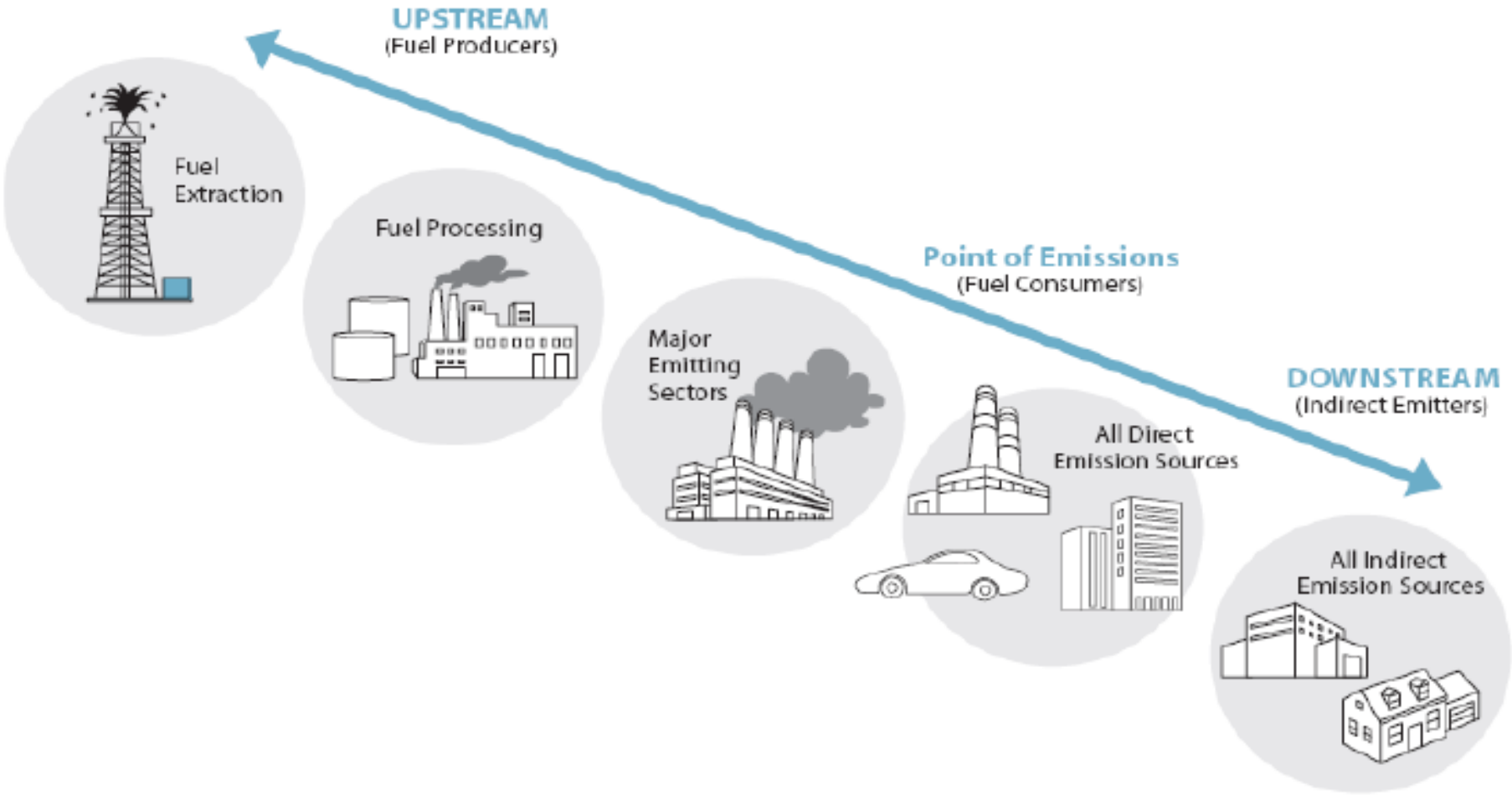
Coverage: **Who Reports What?**

1) Which entities will be subject to the requirements? (Who)

- Emission thresholds
- Energy and/or emissions thresholds
- Source categories
- Production tonnage thresholds
- Number of employees
- Publicly traded companies

- What is the reporting entity and where is the point of obligation for the program?
  - Owner of the facility/installation
  - Operator of the facility/installation (what does "operator" really mean?)
  - Entity named on the environmental permits which the facility/installation must have
  - Holding company which sits above the owner or operator of the facility/installation
- How can this obligation be transferred?

Point of Regulation



S. 2191

- Upstream: Oil, Gas, PFCs, SF6
- Downstream: Coal
- HFCs handled in a separate production/consumption cap (like Title VI)

Source: US EPA

Decision Factors for "who"

- The objectives of the program
- The percentage of total emissions seeking to be captured in the economy
- The desired number of facilities reporting under the program
- Cost to the reporters
- Cost to the program administrator
- Existing reporting programs (voluntary or mandatory, GHG or non-GHG) and the consequent reporting burden
- Capacity of the reporters and program administrator

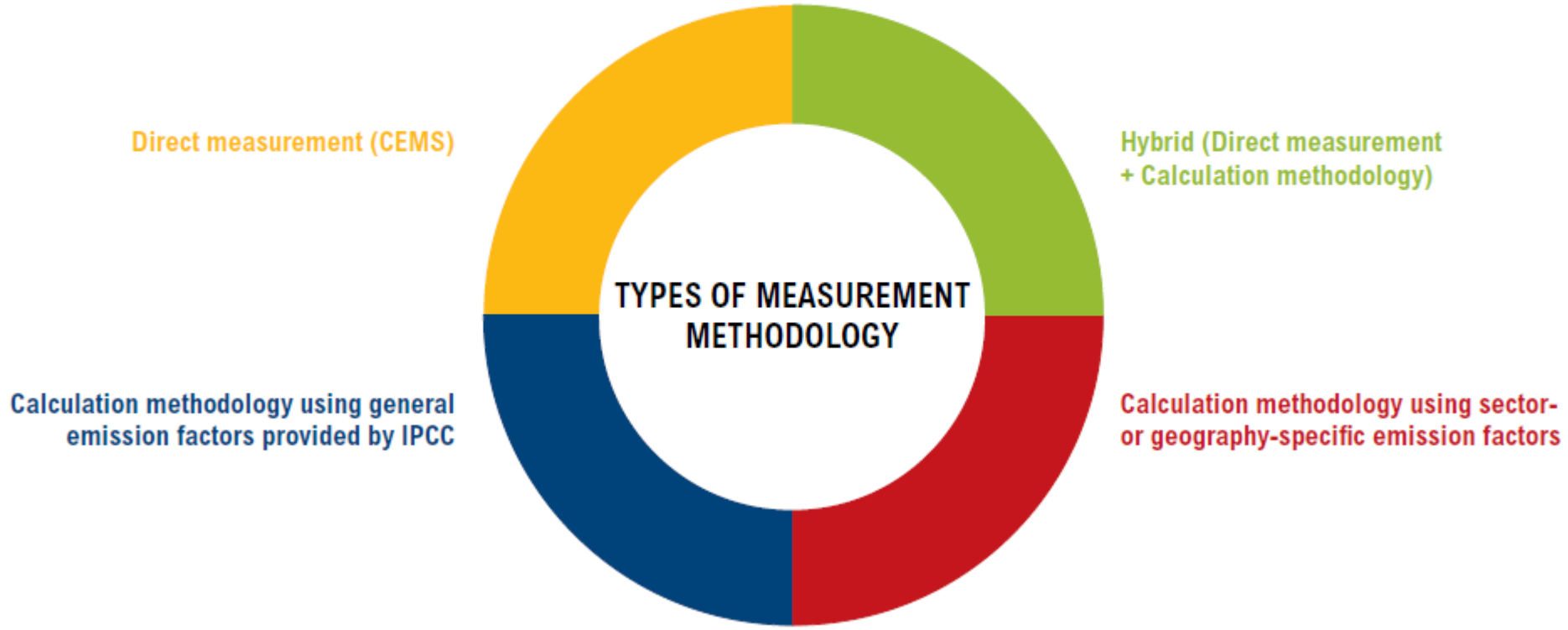
2) What emissions information will be collected from those entities? (What)

- Direct Emissions
  - One source or multiple sources of emissions
  - Includes all sources or exclude some (mobile/small sources)
  - Boundaries setting (land titles, operational control, and transfer points for materials and/or energy)
- Include indirect emissions from power/heat/steam or not

Monitoring & calculation methodology

- Direct measurement
- Calculation based on emission factors
- Hybrid

Types of Measurement Methodology



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Tier Approach

Large Emission Source/Sector

Mid Emission Source/Sector

Small Emission Source/Sector

High Requirements

Low Requirements

Report Information

- Basic Information
- Monitoring Plan
- Emission Information
  - Total
  - Disaggregated
- Third Party/Assurance Statement
- Supporting Data
  - Production data
  - Energy consumption data
  - Others
- Retained Information (Retained but not report)

Consideration for setting up the compliance cycles

- Existing reporting cycles for reporting entities
- Time between the end of the reporting period and the deadline for reporting to allow for data collection, QA/QC and management approvals
- Availability of qualified people to do the third party work which is required (ie, verification)
- Capacity of the program administrator to receive and process reports during certain times of the year

Other elements

- Data Quality Control and Quality Assurance
- Data Disclosure and Presentation

- China

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- Existing MRV programs in China
  - ETS Pilots
    - 5 cities: Beijing, Shanghai, Shenzhen, Tianjin, Chongqing
    - 2 provinces: Guangdong, Hubei
  - National level
    - About to release
    - 6 sectors

MRV Program Design Elements - China

Coverage

Pilots	Sectors	GHGs
Beijing	Power, Heat, Cement, Petrochemical, Service (Education, Health, Retail, State agency, Bank, Real Estate etc.), Other Industries (e.g. Transportation equipment manufacturing, Liquor production)	Only CO2: (1) Direct emissions: fossil fuel combustion, industrial processes (2) Indirect emissions: Purchase and consume electricity and heat
Shenzhen	Power, 26 Industries (e.g. Electronic), Building , (Future: Transportation)	
Shanghai	Power Industry: Iron&steel, Petrochemical, Chemical, Non-ferrous metal, Building materials, Textile, Paper making, etc Service: Aviation, Port, Airport, Railways, Commerce, Hotels, Finance	
Guangdong	Power, Cement, Iron&steel, Petrochemical	
Hubei	Power, Iron&steel, Petrochemical, Cement, Vehicle manufaturing, Non-ferrous metal, Glass, paper making	
Chongqing	Power, Aluminium, Ferroalloy, Calcium carbide, Caustic soda, Cement, Iron&steel	
Tianjin	Power, Iron&steel, Chemical, Heat, Petrochemical, Oil and gas production, Building	

- Coverage
  - National level
    - Sector
      - Power
      - Chemical
      - Iron & steel
      - Non-ferrous metal
      - Cement and flat glass
      - Aviation
    - GHGs: CO2 (direct & indirect), and others

- Thresholds
  - Beijing
    - ETS: 10,000 tCO2 / 5,000 tce consumption
    - Report: 5,000 tCO2 / 2,000 tce consumption
  - Shanghai
    - ETS: 20,000 tCO2 (Industry), 10,000 tCO2 (other)
    - Report: 5,000 tce
  - Shenzhen
    - ETS: 5,000 tCO2 / 20,000 sqm. (Building)
    - Report: 3,000 tCO2

Verification

	Need a MP?	Emission report submission	Verification report submission	Verification contract signed with
Beijing	No	End of March		Competent authority /Company
Shenzhen	No	31 March	30 April	Company
Shanghai	Yes	15 April		Competent authority
Guangdong	Yes	10 March		Competent authority
Hubei	Yes	End of February	End of April	Company
Chongqing	Not specified	20 January	20 April	Competent authority
Tianjin	Not specified	30 April		Not specified

- Compliance
  - Beijing
    - Refuse to report: fine 50-100k RMB, suspension of subsidies & approval of investment
    - Under-reporting: Withhold double allowances
  - Shenzhen
    - refuse to report: fine 50-100k RMB

- Energy consumption reporting vs Emission reporting
  - Verification
  - Owner/operator
  - Location
  - Activities

- Pilot practical experience & challenge
  - Costs vs Accuracy
  - Consistency vs Accuracy
  - Company location vs emission location
  - Company merge, split, acquisition

- USA

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USA GHG Reporting Program Elements

- Level of Reporting
- Coverage (see table)
- Thresholds (see slides)
  - "All-In"
  - 25,000 metric tons CO2e
  - Certain Suppliers
- Methodologies
- Data Collection
- Verification (see slide)

USA GHG Reporting Program Coverage

Power	Refining & Petrochem.	Other Chemicals	Combustion	Waste	Metals	Minerals	Pulp & Paper	High GWP Gases
-Electricity Generation - Electrical Equipment Mfg. - Use of Electrical Equip.	- Petroleum Refineries - Petrochem. Production	- Adipic Acid -Ammonia -Hydrogen Production - Nitric Acid - Titanium Dioxide - Phosphoric Acid	- Stationary Combustion	- Municipal Landfills - Industrial Waste Landfills - Waste Water Treatment	- Aluminum - Ferroalloy - Iron & Steel - Lead - Zinc - Magnesium - Silicon Carbide	- Cement - Glass - Lime - Misc. Carbonate Use - Soda Ash Production	- Pulp & Paper	- Fluorinated GHG Prod. - HCFC-22 Prod./HFC-23 Destruction - Electronics Mfg. - Pre-Charged Equip. Imp./Exp. - Suppliers of Industrial Gases

Petroleum & Natural Gas Systems – Direct Emissions	Fuel Suppliers	Carbon Capture &Sequestration	Mining
- Onshore Production - Offshore Production - Natural Gas Processing - Natural Gas Transmission/Compression - Natural Gas Distribution - Underground Natural Gas Storage - Liquefied Natural Gas Storage - Liquefied Natural Gas Import/Export	- Coal based Liquid Suppliers - Petroleum Product Suppliers -Natural Gas Distribution Companies -Natural Gas Liquids Suppliers	- Suppliers of CO2 - Injection of CO2 - Geologic Sequestration of CO2	- Underground Coal Mines

Courtesy of US EPA

US EPA GHG Reporting Program Thresholds

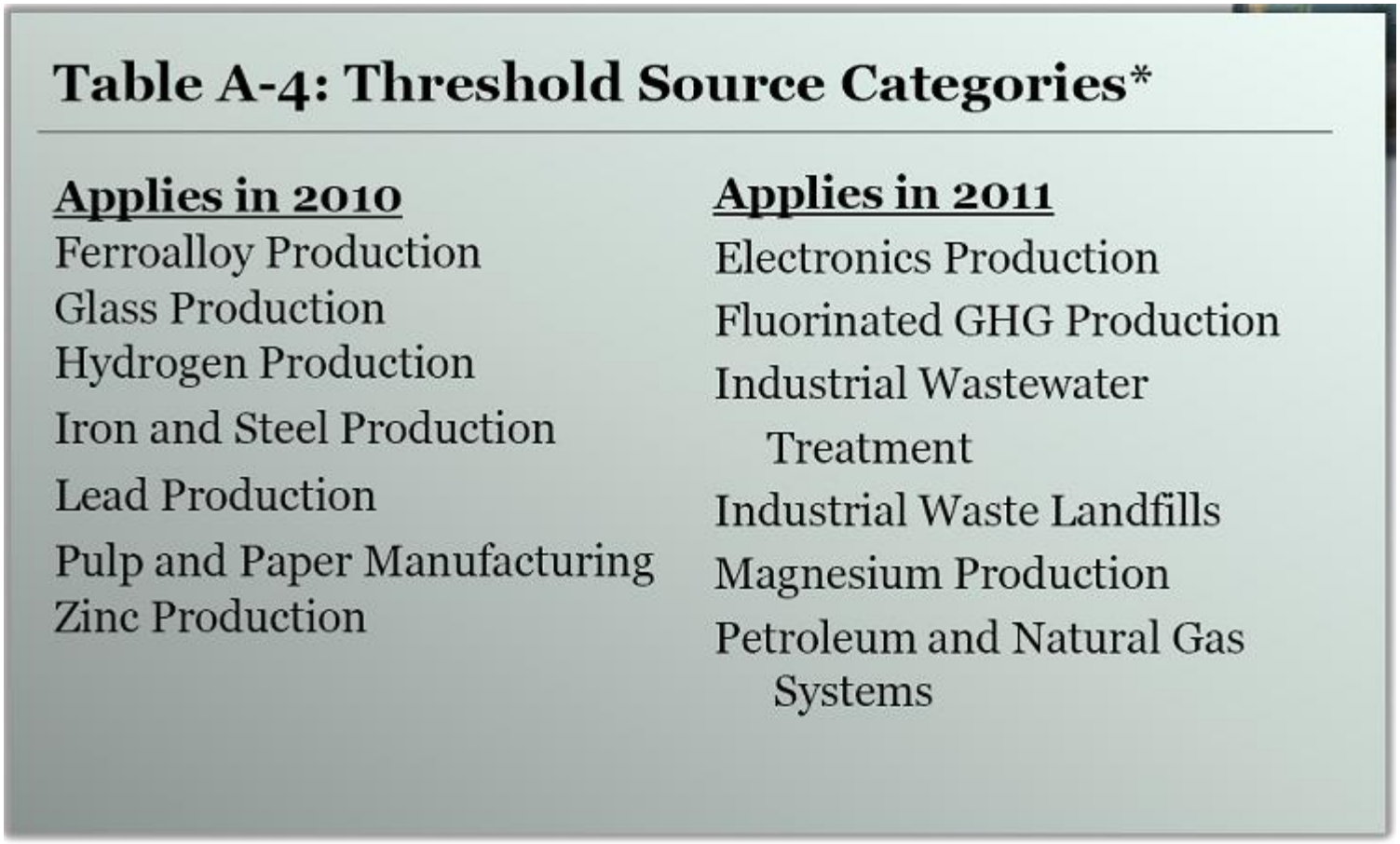


Table A-4: Threshold Source Categories*

Applies in 2010

Ferroalloy Production
Glass Production
Hydrogen Production
Iron and Steel Production
Lead Production
Pulp and Paper Manufacturing
Zinc Production

Applies in 2011

Electronics Production
Fluorinated GHG Production
Industrial Wastewater Treatment
Industrial Waste Landfills
Magnesium Production
Petroleum and Natural Gas Systems

** >25,000 metric tons CO_2e per year from all source categories, combustion units, and miscellaneous use of carbonates.*

US EPA GHG Reporting Program Thresholds

Table A-3: All-in Source Categories

Applies in 2010

- Electricity Generation if report CO_2 year-round through Part 75
- Adipic Acid Production
- Aluminum Production
- Ammonia Manufacturing
- Cement Production
- HCFC-22 Production/ HFC-23 Destruction Processes
- Lime Manufacturing
- Nitric Acid Production
- Petrochemical Production
- Petroleum Refineries
- Phosphoric Acid Production
- Manure Management Systems*
- Silicon Carbide Production
- Soda Ash Production
- Titanium Dioxide Production
- Municipal Solid Waste Landfills that generate $CH_4 \geq 25{,}000$ metric tons CO_2e per year

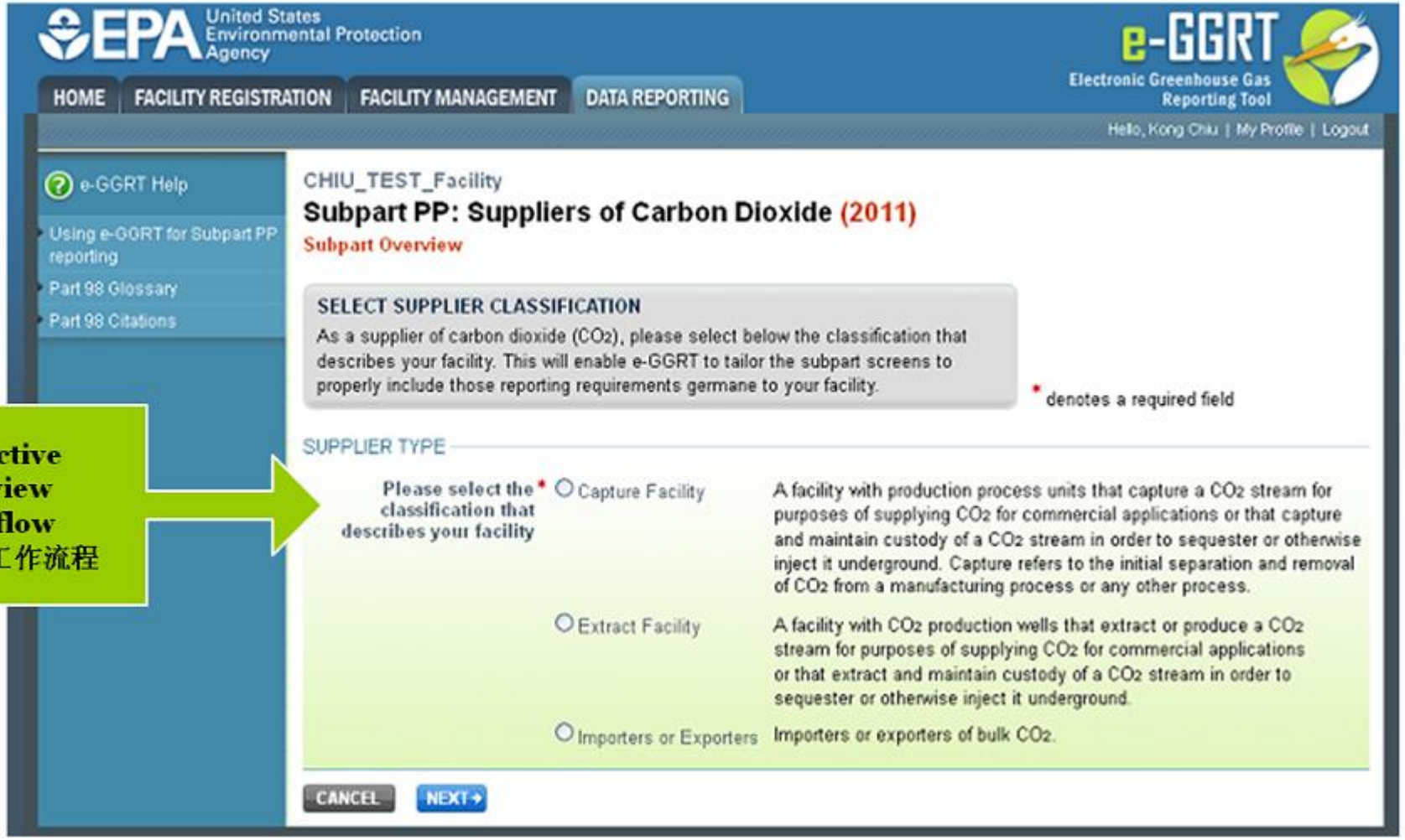
Applies in 2011

- Carbon Dioxide Injection
- Electrical Equipment Use
- Electrical Equipment Manufacturing
- Geologic Sequestration
- Underground Coal Mines that liberate 36.5 million actual cubic feet CH_4 per year

US EPA GHG Reporting Program: Collection

- Electronic Data Collection and Management 电子数据搜集和管理
- EPA's electronic Greenhouse Gas Reporting Tool (e-GGRT) EPA电子温室气体汇报工具(e-GGRT)
- Web-based application for facilities/suppliers to report directly to EPA 设施/供应商直接通过网上系统汇报给EPA
- For Reporting Year 2010, included 29 individual sub-part modules, each with self-guided web forms 2010年有29中子部分模块，每一部分有网上自助表格
- Additional 12 Source Category modules added in mid-2012 2012年中期，新增12中排放源模块
- Also includes option for direct data upload via XML 可选择通过XML来直接上载数据
- Annual Reports are electronically submitted and CROMERR Compliant年度报告以电子形式上交，符合联邦电子报告条规（CROMERR）

Electronic Reporting Tool 电子汇报工具



Interactive Interview Workflow
互动界面工作流程

US EPA GHG Reporting Program Verification

- Reporter Self-Certifies
- Electronic Verification
  - Pre-submittal warning for reporters entering data outside reasonable ranges or missing data
  - Post-submittal verification through logic checks, use of outside data sets, and statistical analyses across facilities
  - Improvements to ranges & algorithms over time with real data
- Staff review and direct follow-up
- Staff review electronic verification results
- Phone/email follow-up- built in secure communications via e-GGRT
- Resubmissions, as needed

- EU

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  - Austrian Environment Agency
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EU – The importance of high quality data

- EU ETS = market instrument
  - Allowances = monetary value
  - Market players want to know their balance → need to buy or sell?
- EU ETS = environmental regulation
  - Competent authority wants to monitor, if targets are reached
  - Competent authority has to protect the integrity of the system
- Both want assurance that

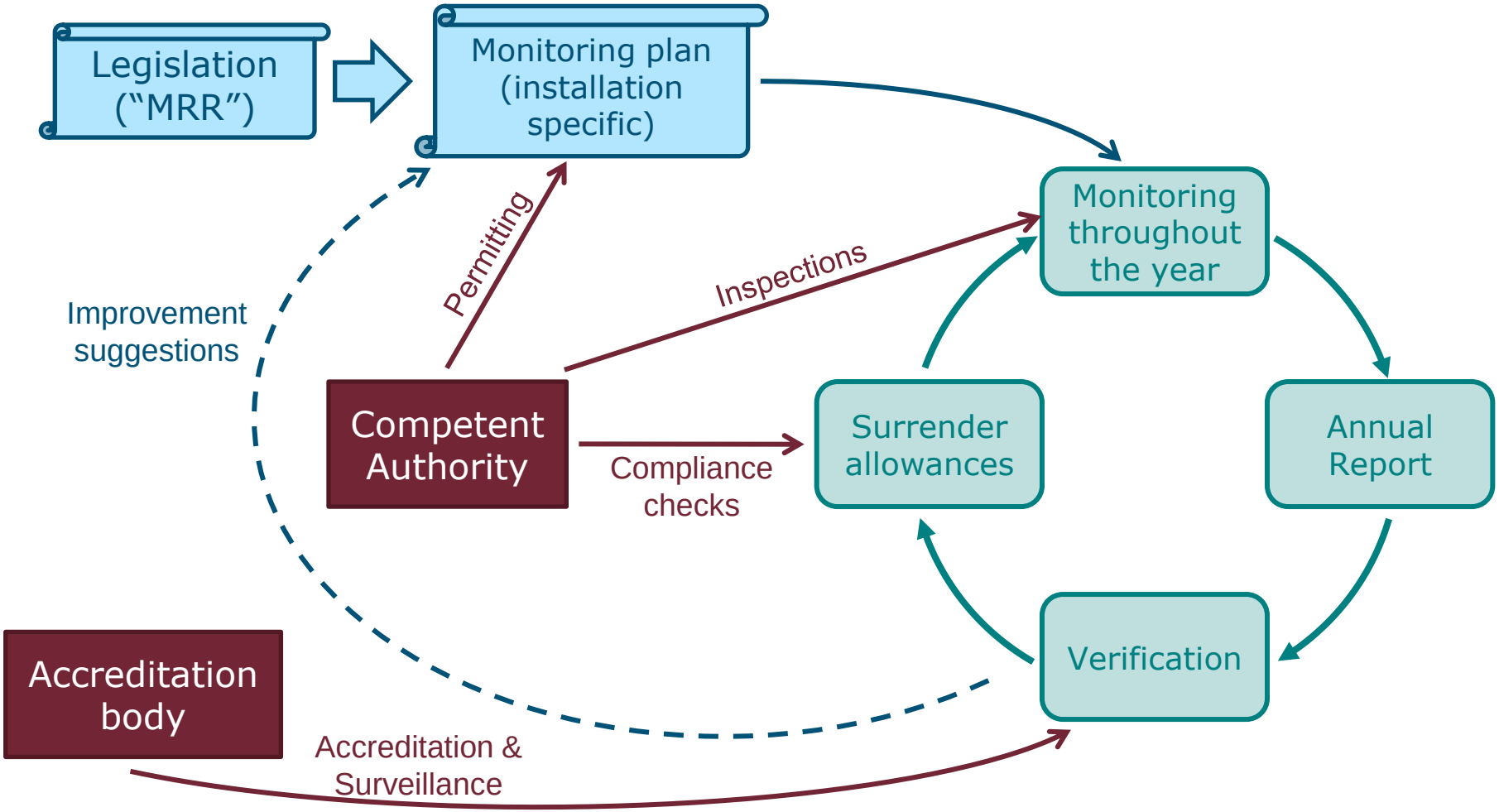
1 ton CO_2 emitted = 1 ton CO_2 reported

EU – MRV principles

- Completeness *(and avoid double counting)*
- Consistency & Comparability
- Transparency
- Accuracy
- Improvement of performance
- Cost effectiveness

- **Mandatory cap-and-trade system**
- Each covered installation must have a GHG emissions permit and a monitoring plan approved by the "competent authority"
- Reporting period = calendar year
- Operator of the installation responsible for monitoring
- 3rd party verification (contracted by operator, verifier must have accreditation)

EU – The “compliance cycle”



Picture by umweltbundesamt

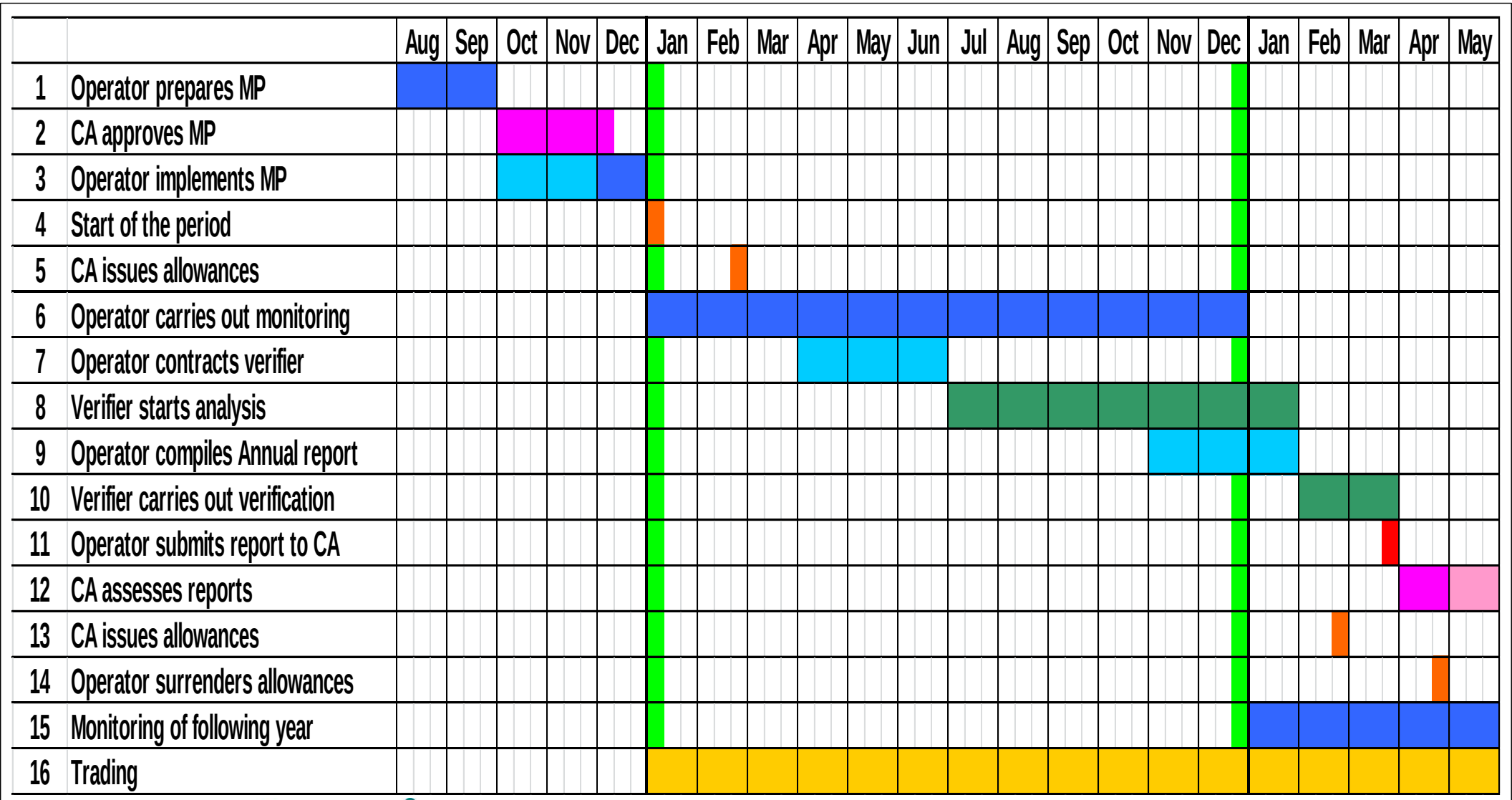
EU – Methods for determining emissions

- In the EU ETS, the aim is to balance data quality and costs
- Use as far as possible available data and existing equipment
- Therefore the Monitoring and Reporting Regulation (MRR) provides for a building block system:
  - Options for overall approach (measurement, standard calculation, mass balance)
  - Options for each parameter (fuel consumption, emission factors,...)
  - Different tiers (=precision levels) possible
- For bigger emissions higher data quality is required

EU – MRV System boundaries

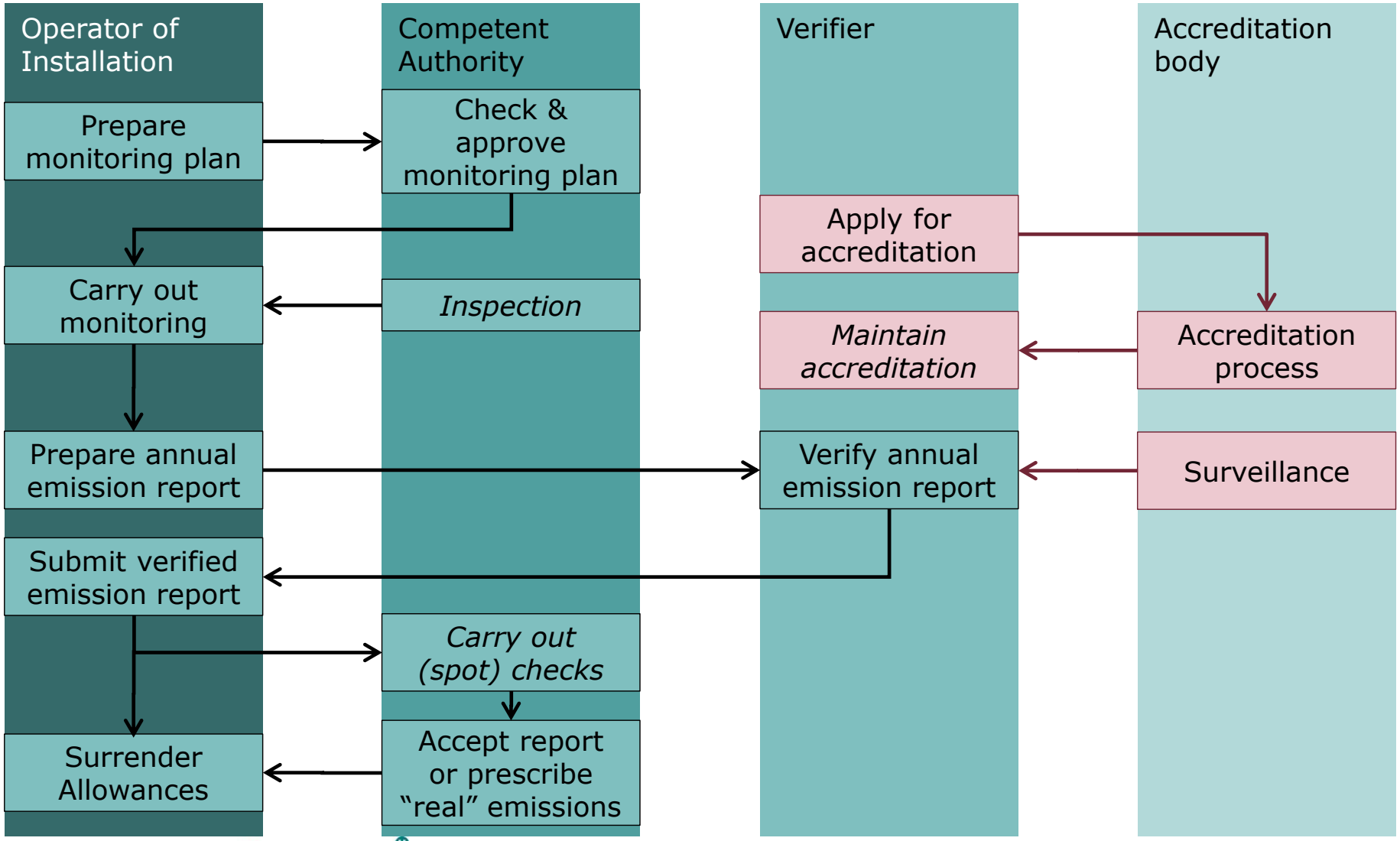
- Emissions:
  - means the release of greenhouse gases into the atmosphere from sources in an installation *[…]* of the gases specified in respect of that activity
- Installation:
  - means a stationary technical unit where one or more activities listed in Annex I are carried out and any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution
- Operator:
  - means any *[legal or natural]* person who operates or controls an installation or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of the installation has been delegated

EU – MRV Schedule



Picture by ENVIRONMENT AGENCY AUSTRIA umweltbundesamt

EU – MRV Governance structure



- Design elements provide a useful structure for creating an MRV program design
  - Each one of the design elements can be considered in turn to build up an outline of the total MRV program
  - The situation within the program jurisdiction will determine the options available for each of the design elements (ie, “what works here?”)
- Once the outline of a program design is created, further detail can be developed under each of the design elements

- The MRV program design must consider the interaction and trade-offs between the various design elements.
- For example:
  - Applicability of the program influences the choice of definition for a facility/installation
  - Reporting schedules influence the required capabilities of the institutions (and verifiers)
  - Program objectives will help to define which non-emissions data is important

Questions?

Thank You

For more information on the Partnership for Market Readiness (PMR), please contact:

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- Kazakhstan

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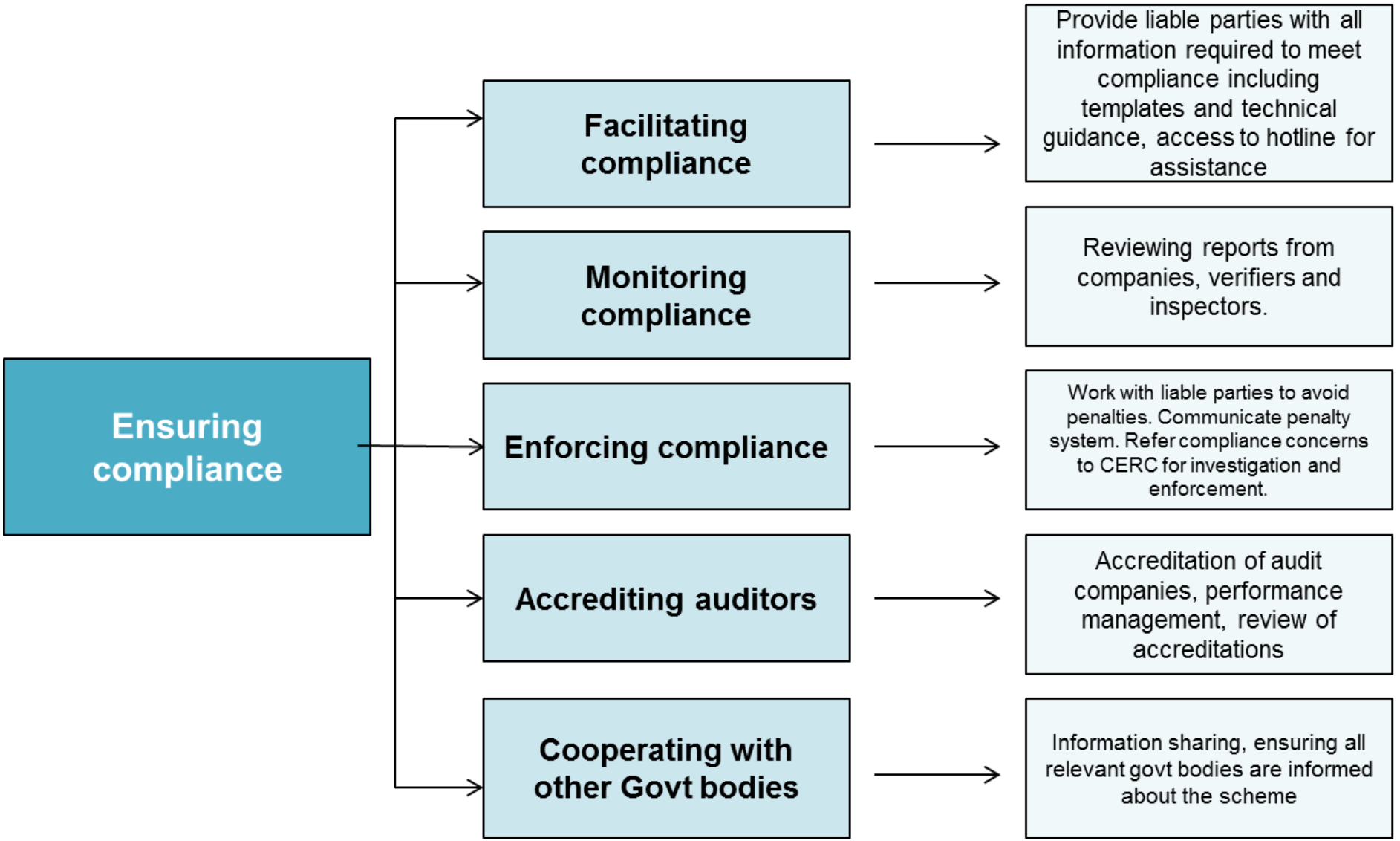
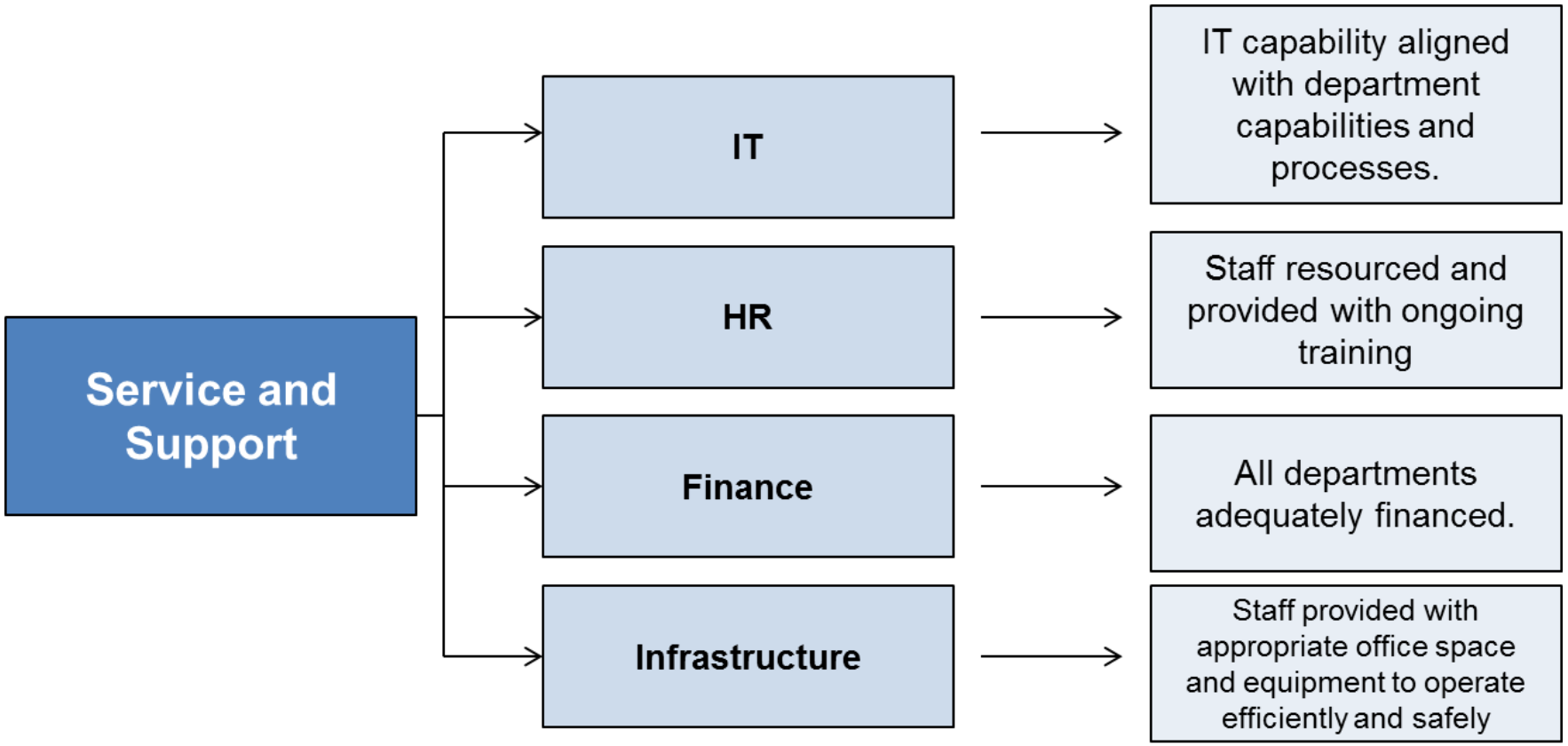
- The ETS is overseen by the Ministry of Environment Protection (MEP)
  - Responsible for relevant policy decisions
- **ETS Administrator** is a company which is owned by MEP and has the responsibility for various Green Development initiatives
  - Zhasyl Damu is establishing its capabilities to effectively administer the Kazakhstan ETS, including the **facility-level MRV program**
  - Recent efforts on **Capability Mapping** and developing an **Operating Model**

- Objectives of capability mapping:
  - Provide a clear picture of the capabilities which the KZ ETS administrator will need to deploy
  - Help MEP/Zhasyl Damu to better understand
    - when different capabilities will be need to ready and how the workload will vary across the year
    - the risks involved in operating the ETS
    - the resources which will be needed to successfully administer the ETS from 2014 onwards
  - Support the budget and planning processes to ensure that administration of the ETS is appropriately funded

Kazakhstan – Capability Mapping



Kazakhstan – Capability Mapping



- The Operating Model lays out how the program interacts with other organisations and how it operates internally
- A "team structure" is suggested for the internal operations
  - Teams are established to manage the broad tasks
  - A team can grow and shrink, using staff or contractors, to deal with variable work load across the year. Staff can be trained to be in multiple teams and respond to demand

Kazakhstan – Operating Model