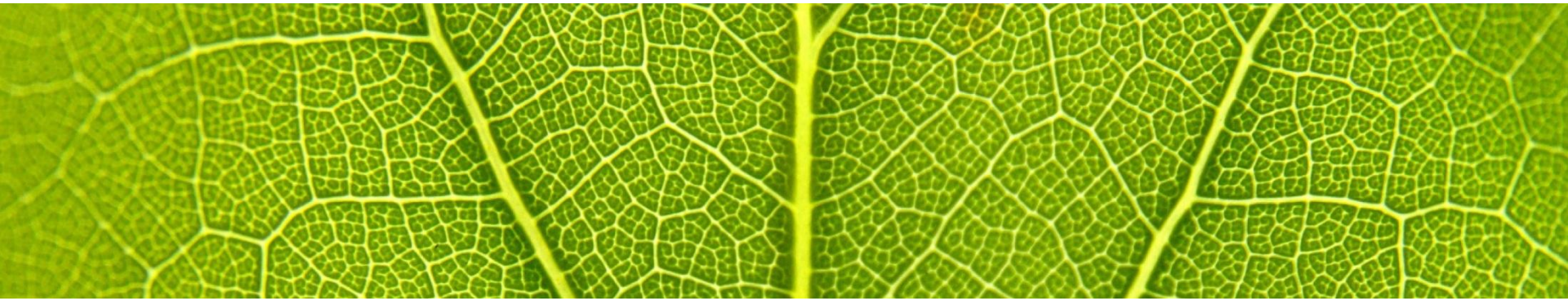
ECOFYS

sustainable energy for everyone



1st Autumn School of the International Partnership on Mitigation and MRV

Other MRV systems – An Overview

17/10/2012 Jochen Froehlich

Agenda

- **Overview existing systems**
- **MRV - Standards**
  - **GHG Protocol Initiative**
  - **ISO 14064 part 1-3**
- **Voluntary systems**
  - **Carbon Disclosure Project (CDP)**
  - **Clean Develop Mechanism (CDM)**
- **Mandatory systems**
  - **EU-Emission Trading Scheme (EU-ETS)**
- **Discussion**

Some terminology

- Accounting Methods
  - accounting rules contained in standards or guidelines such as the GHG Protocol or ISO14064
- Reporting Initiatives
  - schemes that either encourage/enable or require disclosure of emissions – at the level of a corporation; installation; region etc.
- Monitoring (ISO 14064)
  - continuous or periodic assessment of GHG emissions and removals or other GHG-related data
- Verification (ISO 14064)
  - systematic, independent and documented process for the evaluation of a greenhouse gas assertion against agreed validation criteria

Widely adopted methods and initiatives around the world

Global	Europe	North America	Asia-Pacific
• Carbon Disclosure Project (CDP)	• French Bilan Carbone	• US Regional Greenhouse Gas Initiative (RGGI)	• Japanese Voluntary ETS (J-VETS)
• WBCSD/WRI GHG Protocol Corporate Standard	• EU Emissions Trading Scheme (EU ETS)	• US Climate Registry (TCR) General Reporting Protocol	• Japanese GHG Reporting Scheme
• IPCC 2006 GHG Workbook	• UK Department for Environment, Food and Rural Affairs (DEFRA) Guidelines	• USEPA GHG Rule	• Australian Carbon Pollution Reduction Scheme (CPRS)
• ISO 14064: 2006 (Parts 1 and 3)	• UK Carbon Reduction Commitment (CRC)	• US Securities and Exchange Commission (SEC) Guidance	• Australian National Greenhouse and Energy Reporting (NGER) Scheme
• Climate Disclosure Standards Board (CDSB)	• UK Climate Change Levy Agreement (CCLA)	• Californian Climate Action Registry (CCAR)	
• Enterprise Carbon Accounting (ECA)[#]	• Dutch Energy Covenant	• US EPA Climate Leaders Inventory Guidance	
• International Local Government GHG Emissions Analysis Protocol (IEAP)	• The Carbon Trust Standard (CTS)	• Environment Canada GHG Emissions Reporting Program	
• Global Reporting Initiative (GRI)		• Chicago Climate Exchange (CCX)	
• API/IPIECA GHG Compendium*		• US GHG Protocol Public Sector Standard	
• WBCSD/WRI GHG Protocol Scope 3 Reporting Standard			

Sources: Company GHG Emissions Reporting – A Study on methods and Initiatives (EU-Commission)

…and around 60 others that are less widely adopted

World Bank methodologies for CDM projects	Öko-Institut GEMIS
IFC Carbon Emissions Estimator Tool	California Air Resources Board (CARB) for AB32
UK Regional Development Agency Carbon Assessment Tool	IETA EU MRV Guidelines for New Sectors and Gases
Corporate Register	Chinese Energy and GHG Management Program
UNEP GHG Indicator Method	International Accounting Standards Board (IASB) guidance
UNEP/World Bank GHG Standard for Cities	Mexican GHG Program
EBRD GHG Assessment Method	Philippines GHG Accounting and Reporting Program
UK Local Government Association Nottingham Declaration	Brazilian GHG Protocol Program
CAC40, DAX, NYSE and FTSE Disclosure Rules	Indian GHG Inventory Program
UK Sustainable Development Commission Guidance	Korea National GHG Registry
UK Voluntary Emissions Trading Scheme	South Africa NBI/BUSA-DEAT Initiative
BSI PAS 2050	WWF Climate Savers Program
The Carbon Trust Footprint Company	EMEP/CORINAIR EF Guidebook
Int. Assoc. of Oil & Gas Producers (OGP) Protocol	Respect Europe Business Leaders CC Initiative
New Zealand ETS	WEF Global GHG Registry
Swiss ETS	WBCSD CSI Protocol
CDM Executive Board methodologies	Int. Forum of Forest and Paper Associations Tool
IETA JI/CDM Validation and Verification Manuals	WBCSD/WRI Cross-Sectoral GHG Tools
South African mandatory GHG reporting scheme	WBCSD/WRI Sector-specific GHG Tools
Covenant of Mayors Climate Alliance	WBCSD/WRI Product Life Cycle Standard
Spanish MC3 calculation method	International Aluminum Institute Protocol
US/Canada Western Climate Initiative (WCI)	Cement Sector GHG Protocol
US Midwestern Greenhouse Gas Accord	WBCSD/WRI LULUCF Guidance
London Green500 Initiative	WBCSD/WRI Project Protocol
ISO14067	WBCSD Pulp & Paper Sector Calculation Tool
Carbon Trust SME Guidance	Voluntary offset provider tools
US EIA 1605(b) Program	UK Act on CO2 calculator
ACI Airport Carbon Accreditation Scheme	EpE Protocol for Waste Management Activities
German DEHSt Formular-Management-System (FMS)	Beverage Industry Sector Guidance for GHG Reporting
German PCF project	UK DEFRA Offset Provider Code of Practice

Sources: ERM - IPIECA GHG Reporting Workshop

Features of the 'Top 30' methods/initiatives

Feature	Number with this feature (%)
• Methodological basis linked to WBCSD/WRI GHG Protocol?	48%
• Emission factors quoted/referenced?	47%
• Sector specific guidance provided?	43%
• SME specific guidance provided?	10%
• Relative flexibility in standards (i.e. level of user interpretation allowed)?	Low – 23% Medium – 67% Medium to High – 10%
• Is verification/ assurance required?	Required – 37% Recommended – 10%
• Public disclosure is required?	63%
• Sets GHG reduction targets?	Required – 37% Recommended – 23%
• Provides incentives?	Reputational – 63% Regulatory/Investor – 33% Financial – 27%

Sources: ERM - IPIECA GHG Reporting Workshop

Main conclusions on MRV

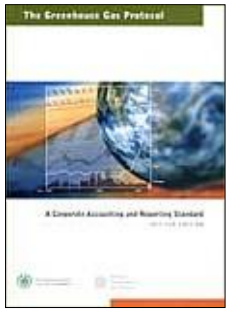
- More than 100 methods and initiatives is a large number!
- High risk that multiple methods in use across different regions and jurisdictions, with different interpretations in use, will cause uncertainty and lack of comparability for companies, investors, policy makers and other stakeholders.
- There is lack of standardization or minimum requirements on a number of methodological issues (e.g. boundary setting, inclusion of Scope 3 emissions, choice of emission factors, allowance for offsets, verification/assurance, reporting thresholds).

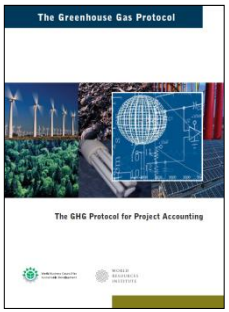
Agenda

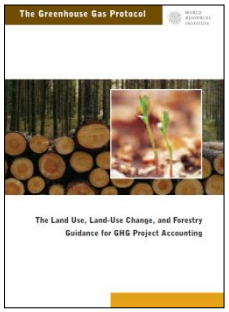
- **Overview existing systems**
- **MRV - Standards**
  - **GHG Protocol Initiative**
  - **ISO 14064 part 1-3**
- **Voluntary systems**
  - **Carbon Disclosure Project (CDP)**
  - **Clean Develop Mechanism (CDM)**
- **Mandatory systems**
  - **EU-Emission Trading Scheme (EU-ETS)**
- **Discussion**

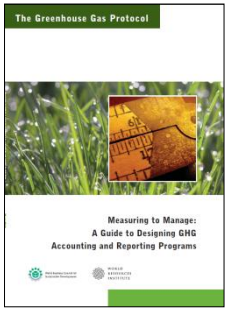
GHG Protocol Initiative

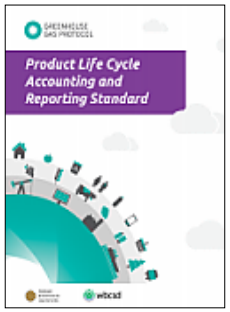
- Convened in 1998 by WBCSD & WRI
- Mission: to develop international GHG accounting & reporting standards for business through an inclusive & transparent multi-stakeholder process
- Two modules: corporate inventories & GHG projects

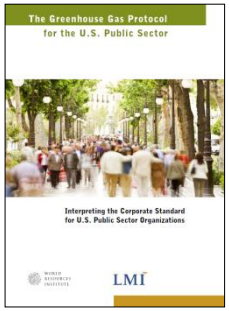


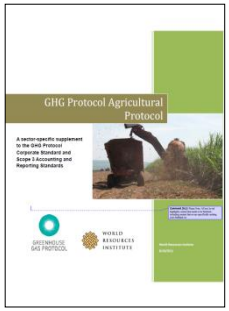


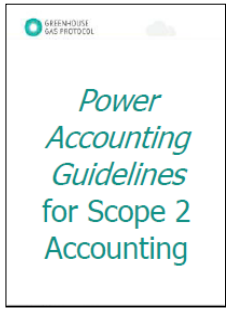






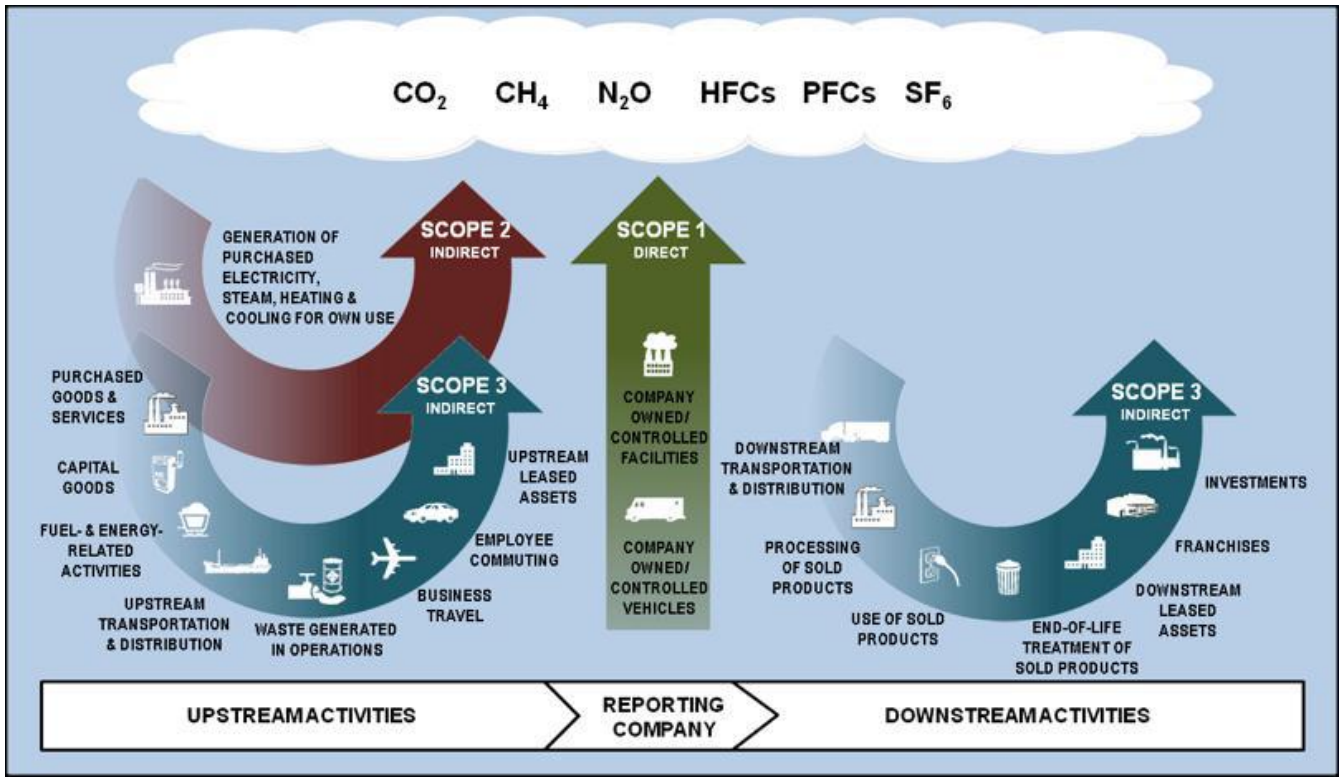






What is corporate GHG accounting and disclosure?

The identification, calculation, categorization and reporting of GHG emissions occurring in defined boundary



GHG protocol - Adoption of the Corporate Standard

Voluntary Climate Initiatives

- U.S. EPA Climate Leaders Program
- WWF Climate Savers Program
- Respect Europe Business Leaders Initiative for Climate Change (BLICC)
- USAID Greenhouse Gas Pollution Prevention Program

Industry Initiatives

- WBCSD Cement Protocol
- International Forum of Forest and Paper Associations
- International Aluminium Association
- International Iron and Steel Institute
- International Petroleum Industry Environmental Conservation Association
- NZ Business Council for Sustainable Development
- European, Japanese, Canadian, and Australian Cement Industry Associations

GHG Registries

- California Climate Action Registry
- Wisconsin GHG registry
- WEF Global Registry

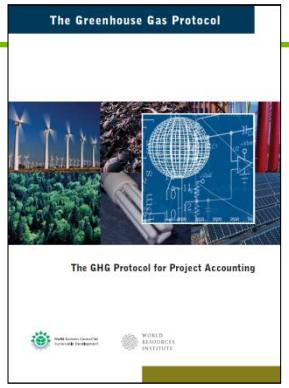
Reporting Initiatives

- Global Reporting Initiative
- CERES Sustainable Governance Initiative
- French REGES Protocol

Trading Schemes

- EU & UK Emissions Trading Scheme
- Chicago Climate Exchange

GHG Protocol - Project Standard



Project Standard – What is it?

Tool to help project developers to account for GHG reductions made by means of specific reduction projects (offsets/credits)

Objectives of GHG Protocol Project Standard

- Simplify GHG quantification & reduce transaction costs
- Improve environmental integrity
- Promote consistency across different trading schemes
- Increase investor confidence/reduce uncertainty

Designing GHG Accounting & Reporting Programs

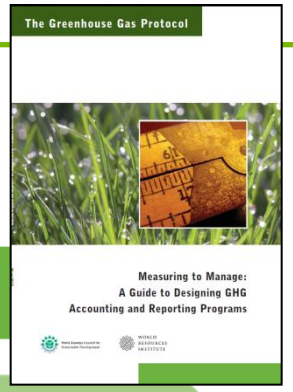


FIGURE 1.3 Steps in Designing and Implementing a GHG Program

CHAPTER 2 Program Objectives and Principles	CHAPTER 3 Elements of GHG Program Structure	CHAPTER 4 Accounting and Reporting Specifications	CHAPTER 5 Inventory Quality Management	CHAPTER 6 Implementation Processes
2.1 What should be the objectives of the program?	3.1 Which sectors, sources, and gases should the program cover?	4.1 How should organizational boundary approaches be defined?	5.1 Which inventory quality management methods should be adopted by the program?	PHASE I: PROGRAM DESIGN
2.2 What GHG accounting principles should the program adopt?	3.2 What geographical boundaries should the program adopt?	4.2 How should indirect emissions be treated?		6.1 Establishing partnerships
2.3 What program design principles should the program adopt?	3.3 How should the reporting entity be defined?	4.3 How should base year establishment and adjustment be addressed?		6.2 Identifying program objectives and principles
		4.4 Should emission accounting thresholds be established?		6.3 Developing program structure and specifications
		4.5 Should sector-specific calculation protocols be adopted?		PHASE II: PROGRAM IMPLEMENTATION
		4.6 What reporting requirements should be specified?		6.4 Building local capacity
				6.5 Recruiting and training business participants
				6.6 Collecting, reviewing, and publishing inventories
				PHASE III: PROGRAM REVIEW
				6.7 Conducting a structured feedback process
				6.8 Identifying next steps

Source: GHG Protocol Inititative

GHG Protocol – Additionality

- **What is it and why does it matter?**
  - Criterion to assess and justify whether or not the GHG reduction would have occurred in the absence of the project
  - Ensures environmental integrity of the reduction when used as an offset

- **Challenges**
  - Most parties involved in the transaction (buyer, broker, seller, and sometimes host country) have an incentive to overestimate the reduction and maximize their own financial gain
  - As the baseline emissions is always hypothetical (what would have happened without the project) there can never be complete certainty

GHG Protocol – Accounting Principles

- **Relevance**
  Use data, methods, criteria, and assumptions that are appropriate for the intended use of reported information
- **Completeness**
  Consider all relevant information that may affect the accounting and quantification of GHG reductions, and complete all requirements
- **Consistency**
  Use data, methods, criteria, and assumptions that allow meaningful and valid comparisons
- **Transparency**
  Provide clear and sufficient information for reviewers to assess the credibility and reliability of GHG reduction claims
- **Accuracy**
  Reduce uncertainties as much as is practical
- **Conservativeness**
  Use conservative assumptions, values, and procedures when uncertainty is high

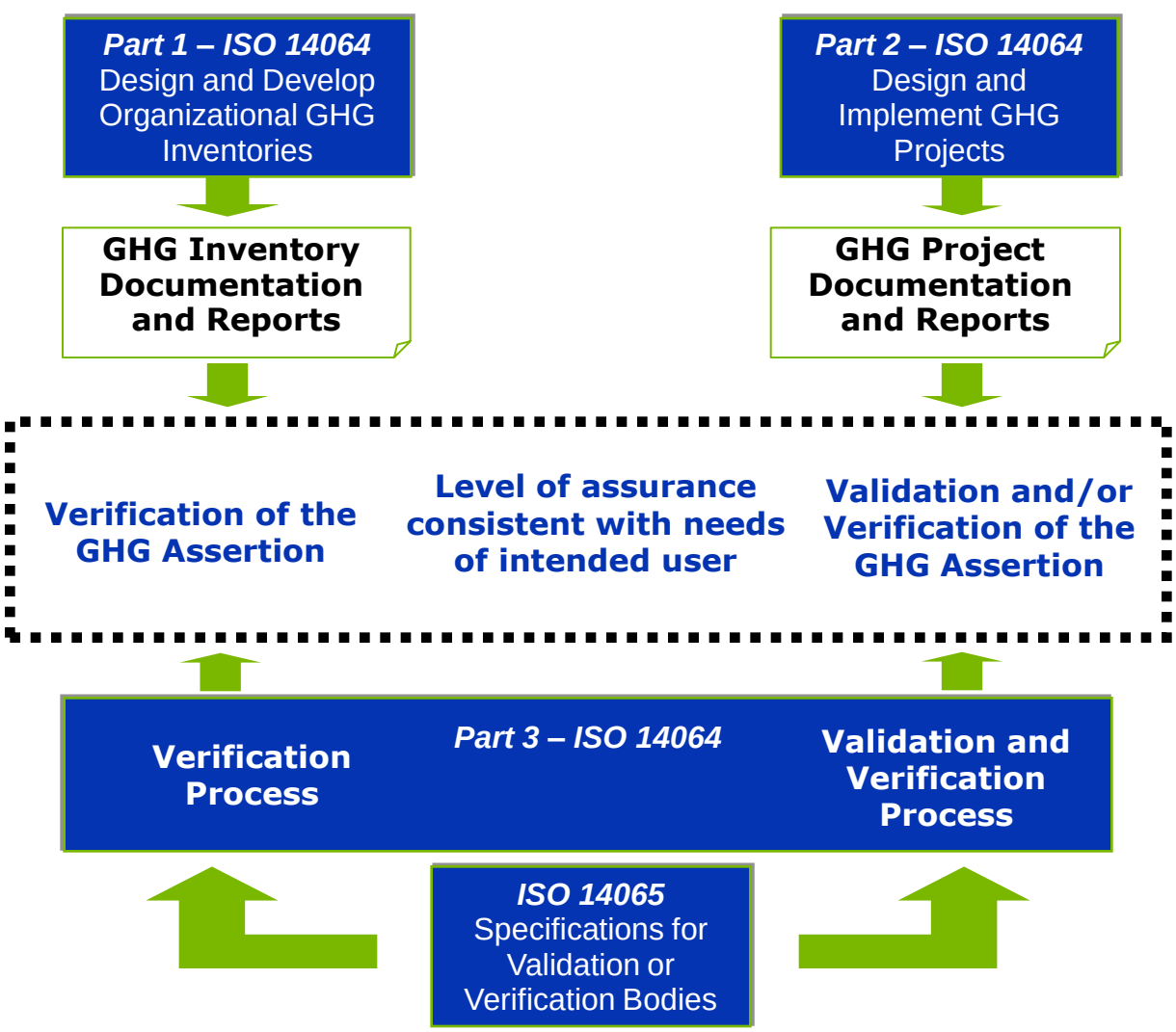
Agenda

- **Overview existing systems**
- **MRV - Standards**
  - **GHG Protocol Initiative**
  - **ISO 14064 part 1-3**
- **Voluntary systems**
  - **Carbon Disclosure Project (CDP)**
  - **Clean Develop Mechanism (CDM)**
- **Mandatory systems**
  - **EU-Emission Trading Scheme (EU-ETS)**
- **Discussion**

ISO 14064 - Overview

- Began in 2002 with identification of need for harmonization of diverse GHG programs proliferating at international, national, regional and local levels
- Included over 11 international negotiation meetings and the efforts of experts representing over 36 countries
- The ISO 14064 standard was released for use in March 2006
- ISO 14065 (GHG verification bodies & Accreditation) – last version April 2012
- ISO 14067 (Carbon Footprint of Products) – under work

ISO 14064 - Framework



Conformance with applicable:

- **GHG Program(s) – CCX, CCAR, US EPA Climate Leaders**
- **Legislation – federal, state/provincial, local**
- **Protocols/Standards – industry guidance (CCAP, IPIECA, etc.), the GHG Protocol, CDM, technical and safety standards/ codes, etc.**

ISO 14064 – Part 1: GHG Inventories

Scope, Definitions, Principles

GHG inventory design and development

- Organizational boundaries
- Operational boundaries
- Quantification of GHG emissions and removals

GHG Inventory components

- GHG emissions and removals
- Organizational activities to reduce GHG emissions or increase GHG removals
- Base year GHG inventory

GHG inventory quality management

- GHG information management and monitoring
- Document retention and record keeping

GHG reporting

- GHG report planning
- GHG report content
- GHG report format
- GHG report dissemination

Verification (Internal/1st party)

ISO 14064 – Part 2: Projects

Scope, Definitions, Principles

Introduction to GHG projects

Requirements for GHG projects

1. General requirements
2. Describing the project
3. Identifying GHG sources, sinks and reservoirs for the project
4. Determining the baseline scenario
5. Identifying GHG sources, sinks and reservoirs for the baseline scenario
6. Selecting GHG sources, sinks and reservoirs for regular monitoring and quantification
7. Quantifying greenhouse gases
8. Managing data quality
9. Monitoring the GHG project
10. Documenting the GHG project
11. Validating or verifying the GHG project (should)
12. Reporting the GHG project (should/shall)

Establishes common principles/requirements for validation and verification

- Competence, ethical conduct
- Validation/verification process
- Level of assurance (scope, objectives, criteria, materiality)
- Audit Methodology (plan, sampling, etc.)
- Assessment criteria (systems, data, program criteria, etc.)
- Validation/verification statement
- Recordkeeping

ISO 14064 – Comparison with GHG Protocol

- **ISO 14064 Parts 1&2 are generally consistent and compatible with respective WBCSD/WRI GHG Protocol modules**
  - ISO 14064 identifies the **what**
  - GHG Protocol provides the **how and why**
  - ISO 14064 can be audited - GHG Protocol provides choices

> **ISO 14064 is designed to be policy and sector neutral**
  - Provides foundation upon which additional requirements can be layered (Additionality, quality thresholds, etc.)

Agenda

- **Overview existing systems**
- **MRV - Standards**
  - **GHG Protocol Initiative**
  - **ISO 14064 part 1-3**
- **Voluntary systems**
  - **Carbon Disclosure Project (CDP)**
  - **Clean Develop Mechanism (CDM)**
- **Mandatory systems**
  - **EU-Emission Trading Scheme (EU-ETS)**
- **Discussion**

Voluntary GHG reporting

- **Motivation:**
  - Corporate Sustainability Reporting
  - Corporate Targets
  - "CO_2 neutral" Products and Services

- **Why?**
  - Motivate employees to accept changes and cost savings
  - Compensate for other sustainability issues
  - Investor and client perception

- **Challenges:**
  - Parallel (only partly compatible) protocols for different purposes/regions
  - Auditing/verification requirements are still evolving

Carbon Disclosure Project - CDP

- **What is CDP?**
  - Launched in 2000, company registered in England, US registered charity. Sponsor liaison is Rockefeller Philanthropy Advisors
  - Task: Collect & distribute high quality info to investors, enterprises & governments to prevent "dangerous climate change"
  - Mission: "accelerate solutions to climate change by putting relevant information at the heart of business, policy and investment decisions."

Andrew Winston (Harvard Business Review):
CDP is "the most powerful green NGO
you've never heard of".

CDP – Reportable "carbon" (CO2) emissions

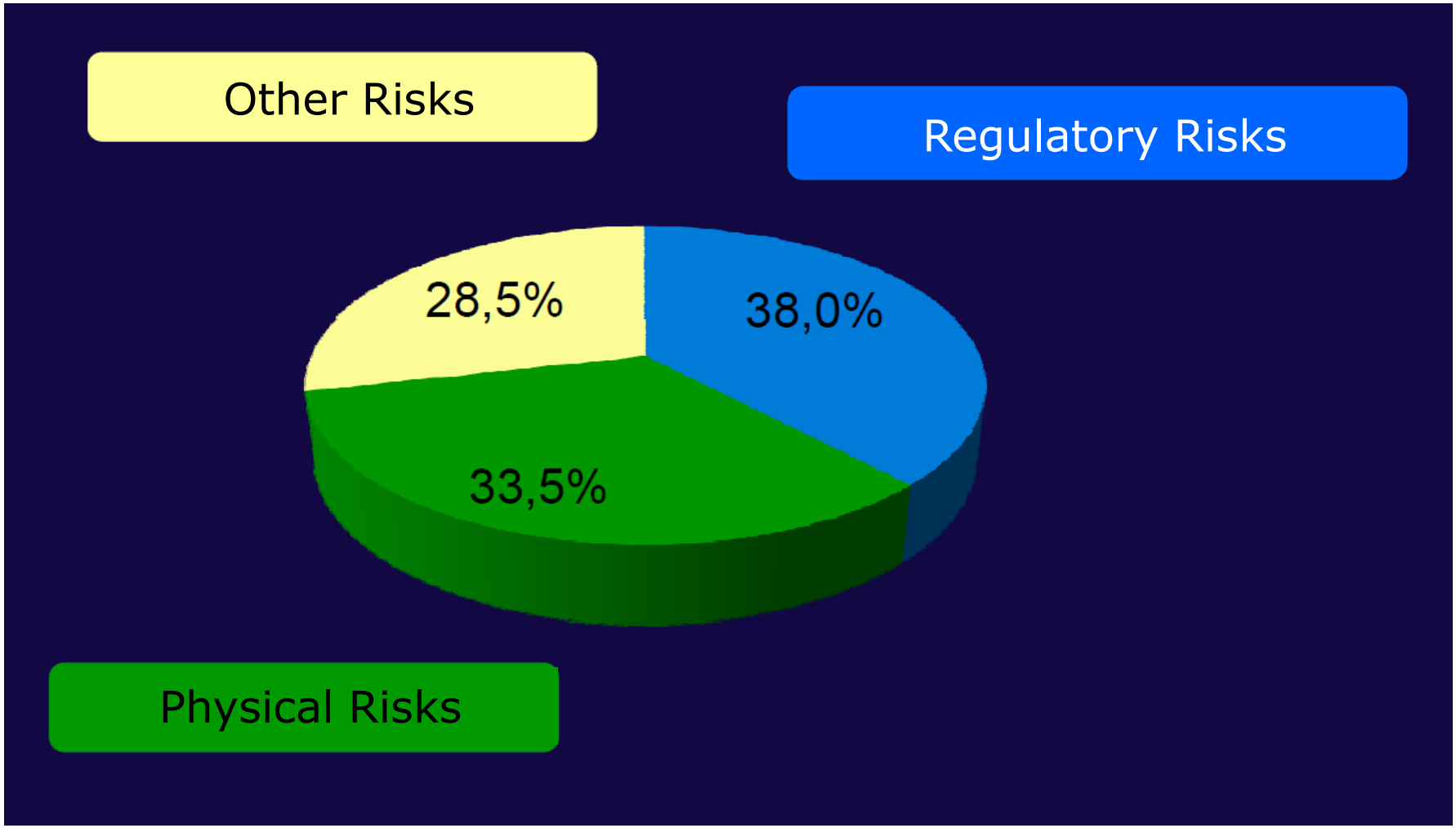
- **3 Scopes of GHG Emissions**

  Scope 1 = direct emissions occurring from sources owned or controlled by company (includes co-owned/controlled vehicles)

  Scope 2 = indirect emissions from production of electricity consumed by company

  Scope 3 = other indirect emissions from activities, but from sources now owned or controlled by the company. E.g. goods transport & contractors

CDP – Reporting on risks

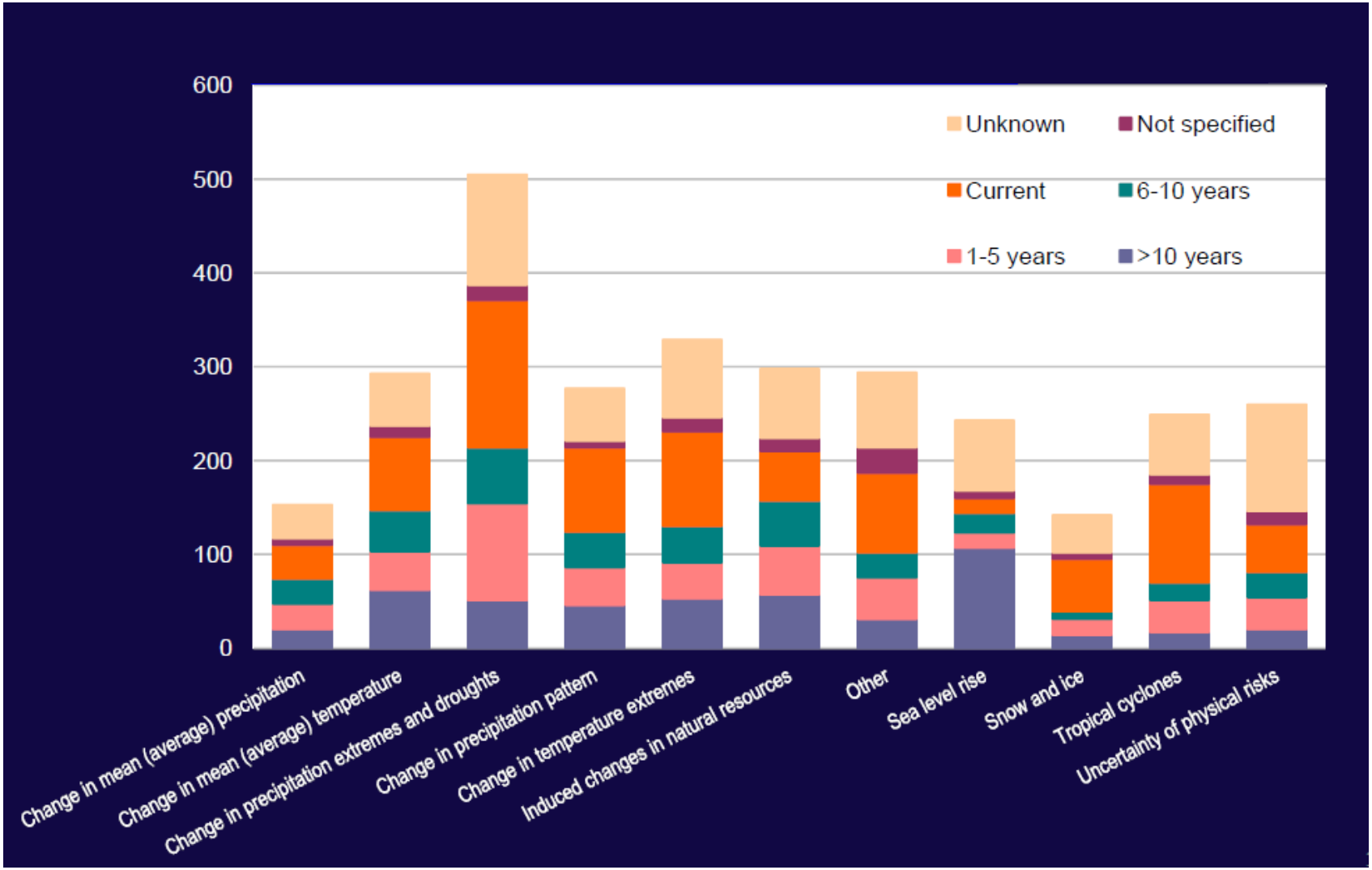


Source: Carbon Disclosure Project

CDP – Regulatory Risks

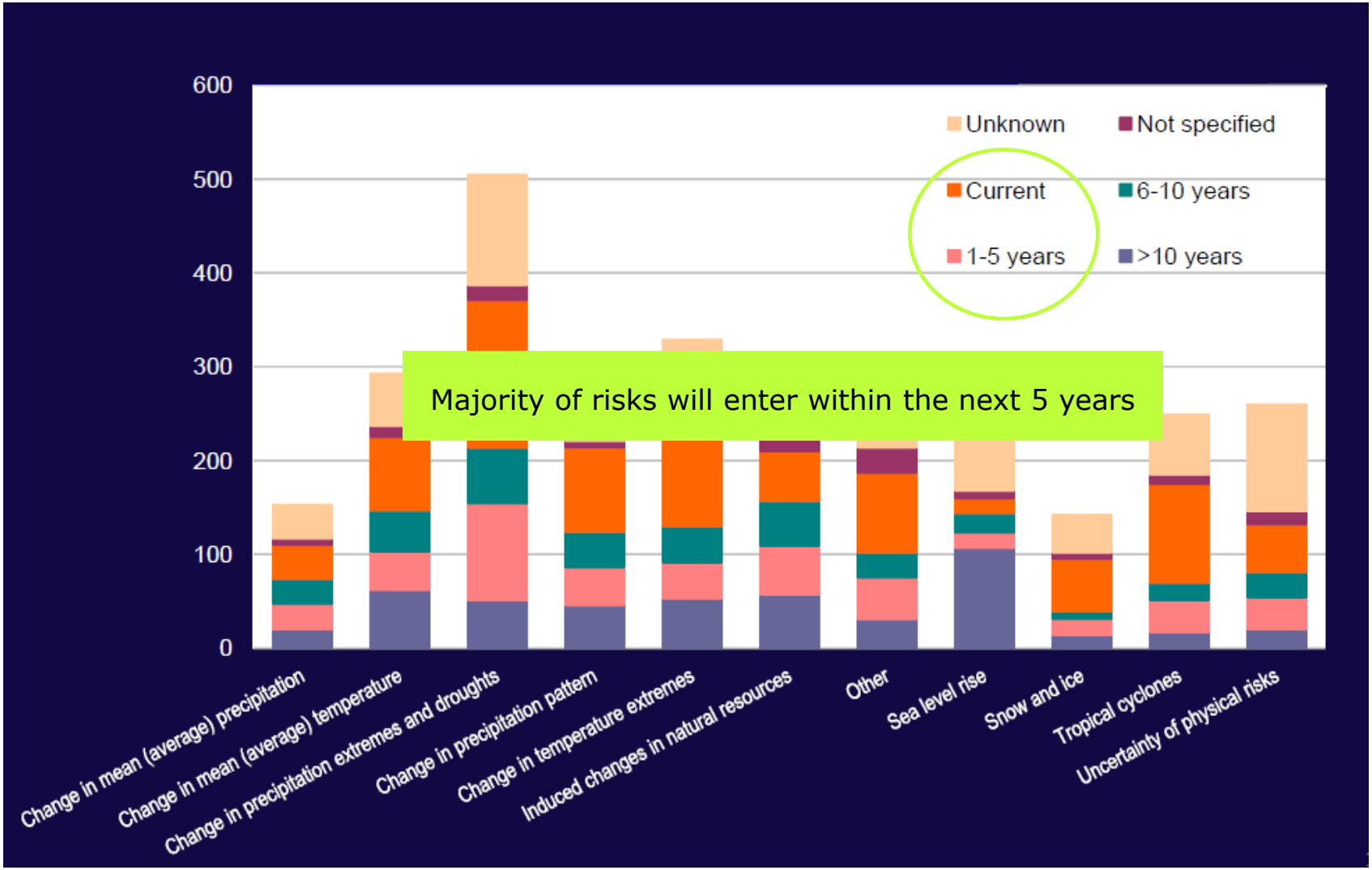
Source: Carbon Disclosure Project

CDP – Physical Risks



Source: Carbon Disclosure Project

CDP – Physical Risks

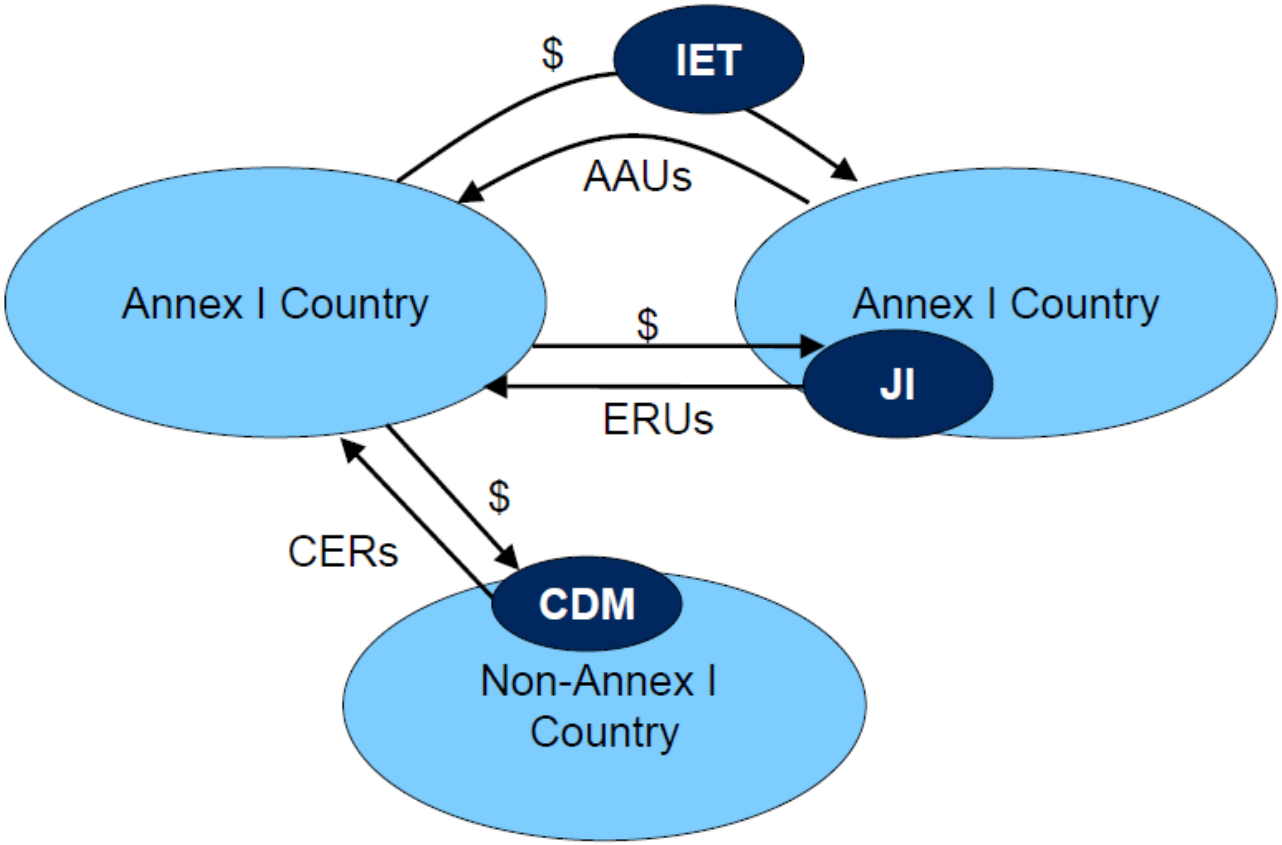


Source: Carbon Disclosure Project

AGENDA

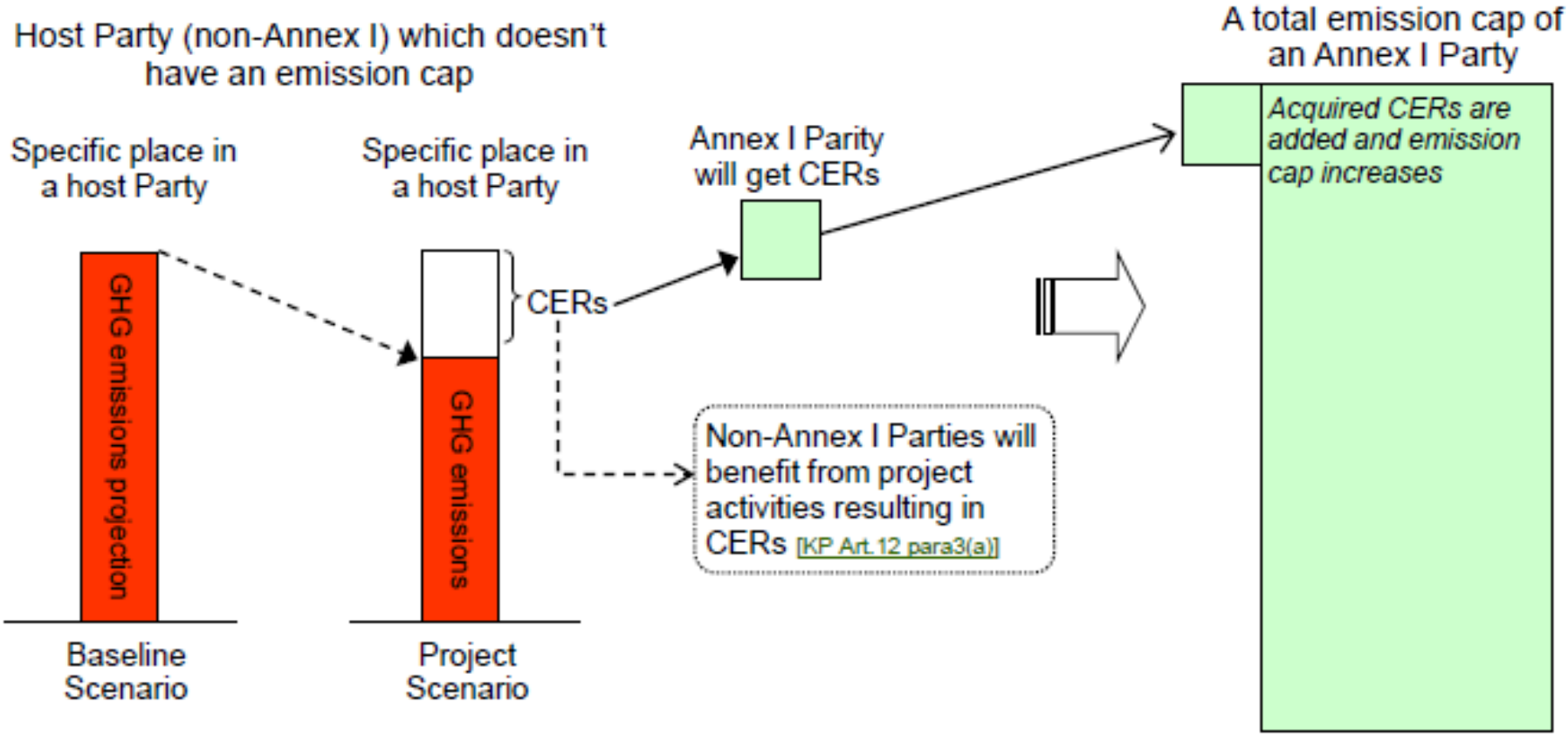
- **Overview existing systems**
- **MRV - Standards**
  - **GHG Protocol Initiative**
  - **ISO 14064 part 1-3**
- **Voluntary systems**
  - **Carbon Disclosure Project (CDP)**
  - **Clean Develop Mechanism (CDM)**
- **Mandatory systems**
  - **EU-Emission Trading Scheme (EU-ETS)**
- **Discussion**

CDM – The Kyoto-Mechanism



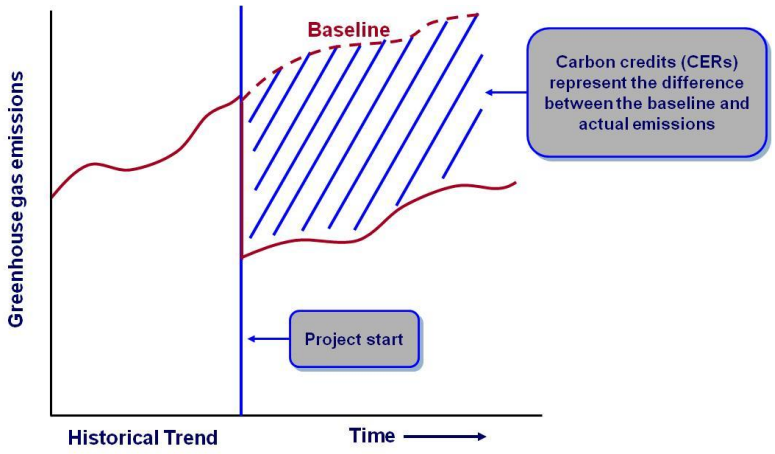
AAU	Assigned Amount Unit
CER	Certified Emission Reduction
ERU	Emission Reduction Unit

The Clean Development Mechanism

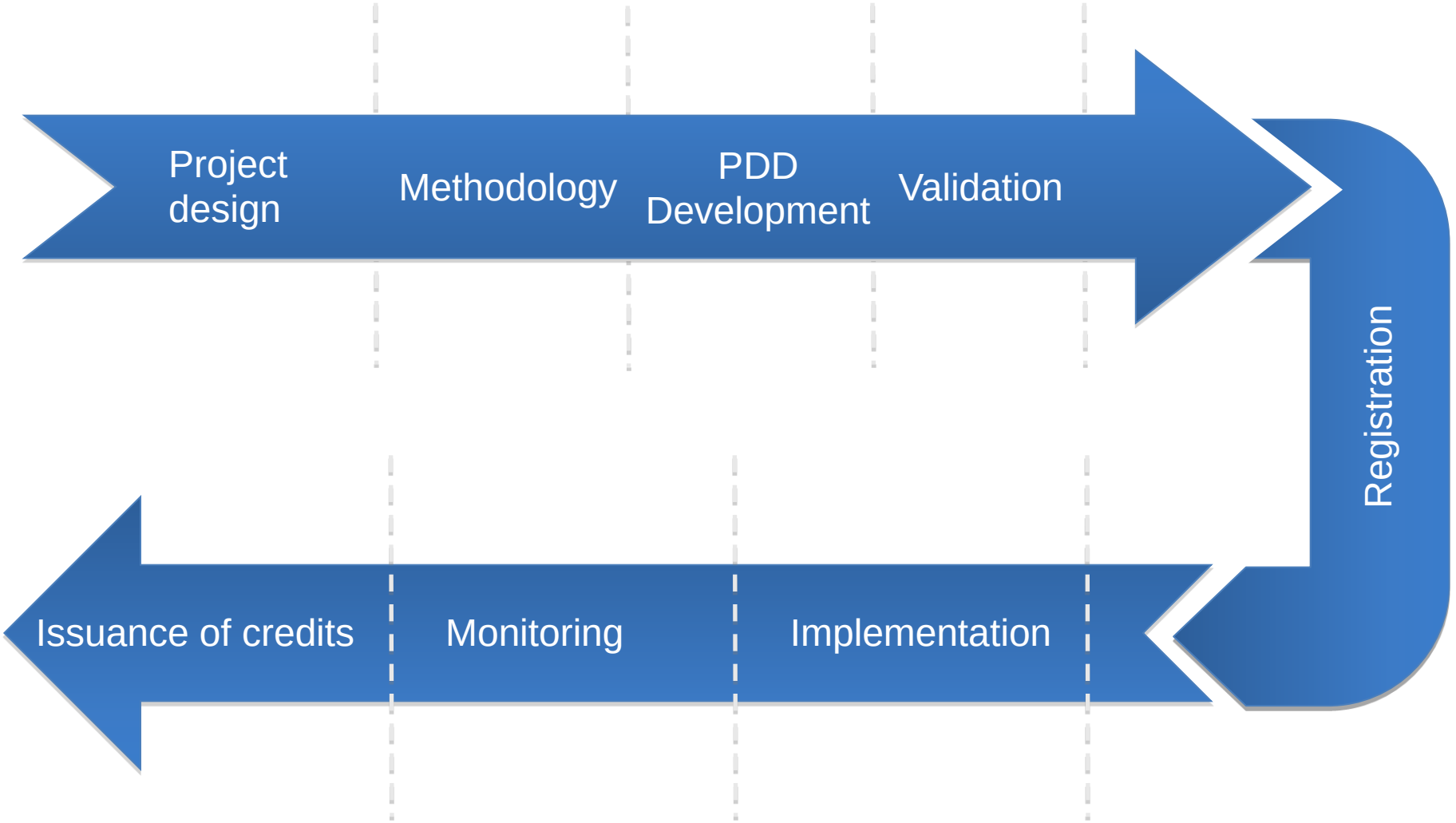


How does CDM work?

- The CDM allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO_2.
- These CERs can be traded and sold, and used by Annex 1 countries to meet a part of their emission reduction targets under the Kyoto Protocol.
- The mechanism stimulates sustainable development and emission reductions, while giving Annex 1 countries some flexibility in how they meet their emission reduction limitation targets.



Steps in the development process



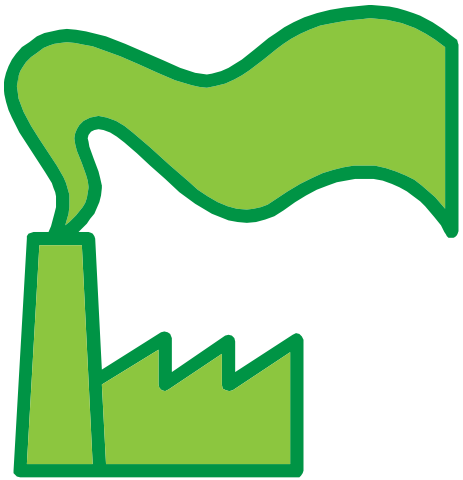
Typical CDM Barriers

- Complex Difficult Matter (CDM)
- Lack of understanding and awareness
- Requires CDM infrastructure
- Capacity limited
- One-stop-shop facility
- Regulatory barriers
- Limited incentives for development tools

Agenda

- **Overview existing systems**
- **MRV - Standards**
  - **GHG Protocol Initiative**
  - **ISO 14064 part 1-3**
- **Voluntary systems**
  - **Carbon Disclosure Project (CDP)**
  - **Clean Develop Mechanism (CDM)**
- **Mandatory systems**
  - **EU-Emission Trading Scheme (EU-ETS)**
- **Discussion**

EU-ETS - The compliance cycle



Each installation needs to have a permit and a verified monitoring plan

Throughout the year, installations can buy and sell allowances on the market

The Key Objectives of the EU MRV-regulations

- Ensures that all emission sources in the ETS are covered (scope is defined in the Directive itself)
- Ensure that within the ETS a ton is a ton
- Ensure a level playing field across EU-27
- Achieve transparent reporting

- Ensure consistency with inventories under UNFCCC
- Flexibility and cost-effectiveness for different sectors, technologies, installation sizes & ages
- Achieve an accuracy at a level of a few % uncertainty for each installation

Monitoring plan

- Developed by the operator & approved by the competent authority (incl. revised versions)
- 2 alternatives to determine emissions: calculation ⇔ measurement
- Tier-Concept (= different levels of accuracy depending on total emissions)

- Facilitation for small emission streams (de-minimis)
- Use of lower tiers possible, but approval required
- Contains information on activities, emission sources, monitoring method and data quality check & control
- Detailed rules for specific emission sources (mass balance)

Reporting

- Operator is required to hand in a verified emission report for the previous year by March 31
- Most Member States have a reporting template, but formats vary: reporting on paper, excel-tool, software, web interface…
- Operator sends verified emission report is sent to competent authority together with verification statement, either with real or electronic signature
- The competent authority reviews at least a share of emission reports and verification reports
- Ideally, the competent authority communicates findings from review to verifiers and accreditation bodies

Verification in EU ETS

- Focus on independent verification: in nearly all EU Member States the verification market is a private market
- The verifier can be held liable if he deliver an incorrect verification statement

- Verifiers have to be accredited by an accreditation body to be able to perform verifications under the EU-ETS
- Strategic analysis and risk assessment required as base for a verification plan: which information to review (sampling!), how to review, whom to interview
- Access to all sites and information to be given to the verifier by the operator and all sources are to be verified

Verification in EU ETS

STRATEGIC ANALYSIS

- **Overview of all installation's activities**
- **Understand significance of emissions**

PROCESS ANALYSIS

- **Verify information on-site**
- **Use spot-checks to determine data reliability**

RISK ANALYSIS

- **Evaluate reliability of data from each source**
- **Identify high-risk sources, checking emissions factors & calculations (materiality)**
- **Verify risk control methods minimising uncertainty**

REPORT

- **Specify issues relevant to verification work**
- **Opinion that reported emissions are not materially misstated**

AGENDA

- **Overview existing systems**
- **MRV - Standards**
  - **GHG Protocol Initiative**
  - **ISO 14064 part 1-3**
- **Voluntary systems**
  - **Carbon Disclosure Project (CDP)**
  - **Clean Develop Mechanism (CDM)**
- **Mandatory systems**
  - **EU-Emission Trading Scheme (EU-ETS)**
- **Discussion**

Discussion

Question 1:

Should at least the verification or the complete MRV process of a national GHG reduction programme organised by a system regulated by public law or by private sector(s)? - Advantages & disadvantages of the public / private system

Question 2:

Which system would you prefer – a mandatory scheme for a defined scope of installation/enterprises (like ETS) or a voluntary opt-in scheme with tax incentives (reduction commitment in return of lower taxes? What are pro & cons?

Thank you for your attention

Ecofys Germany GmbH

Am Wassermann 36

50829 Cologne

Germany

T: +49 (0)221 27070-100

E: info@ecofys.com

I: www.ecofys.com