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MRV ROADMAP FOR GEORGIA

ASSESSMENT OF THE STATUS QUO



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ENVIRONMENT
AGENCY AUSTRIA **umweltbundesamt**^U

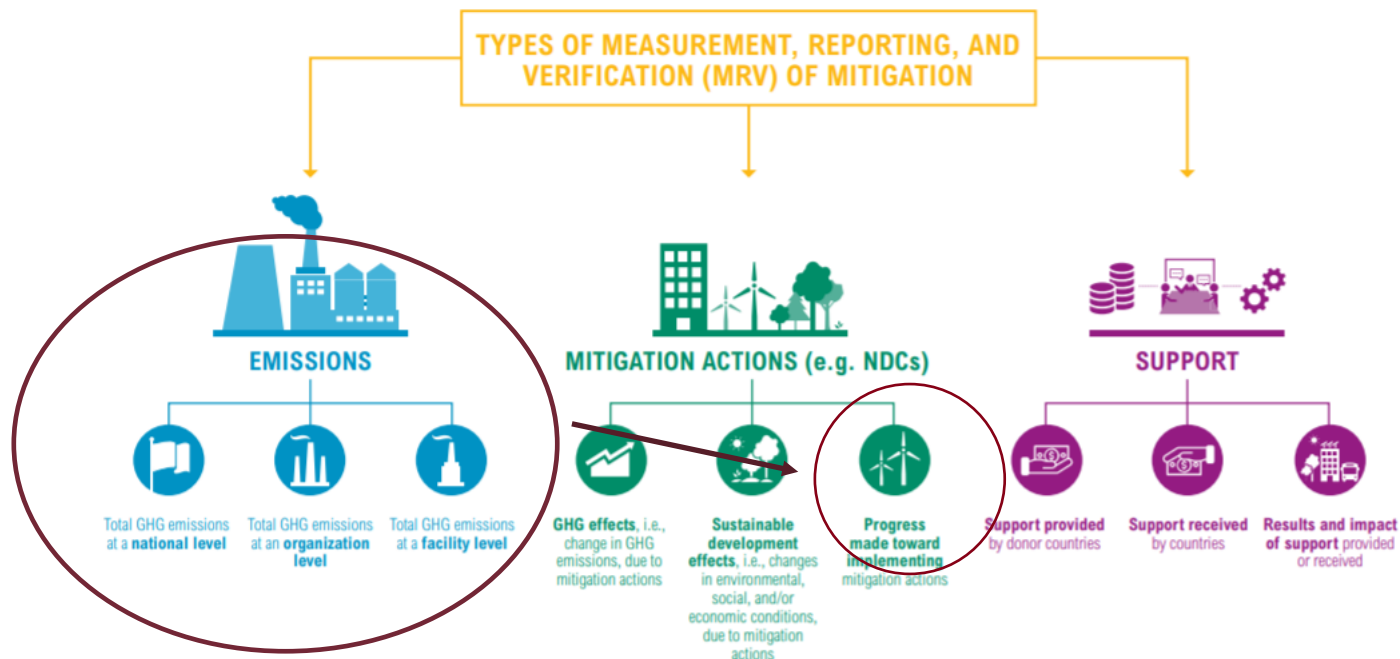
AGENDA

- Paris Agreement Enhanced Transparency Framework (ETF)
- Interlinkages between ETF and Article 6
- National Inventory Systems (NIS)
- Overview of the Georgia's NIS
- Technical elements that are part of inventory preparation
- Proposed MRV Roadmap for Georgia

WHAT IS MRV

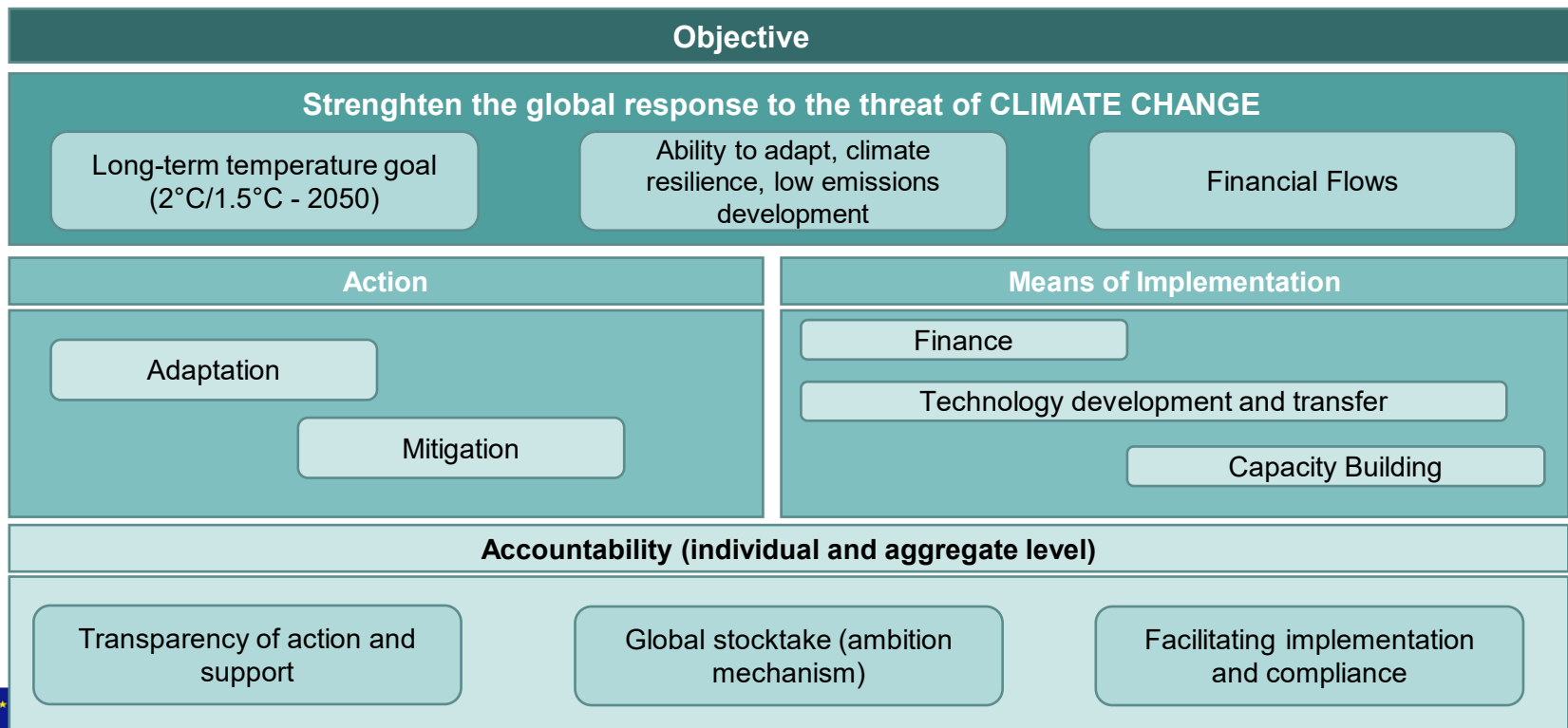
- Measure or monitor (M) data and information on emissions, mitigation actions and support. This can entail measured GHG emissions, estimating emissions or emissions reductions utilizing activity data and emission factors, calculating changes relevant to sustainable development, and collecting information about support for climate change mitigation
- Report (R) by compiling this information in inventories and other standardized formats to make it accessible to a range of users and facilitate public disclosure of information
- Verify (V) by periodically subjecting the reported information to some form of review or independent assessment to establish completeness and reliability. Verification helps to ensure accuracy and conformance with any established procedures, and can provide meaningful feedback for future improvement.

VARIOUS TYPES OF MITIGATION RELATED MRV

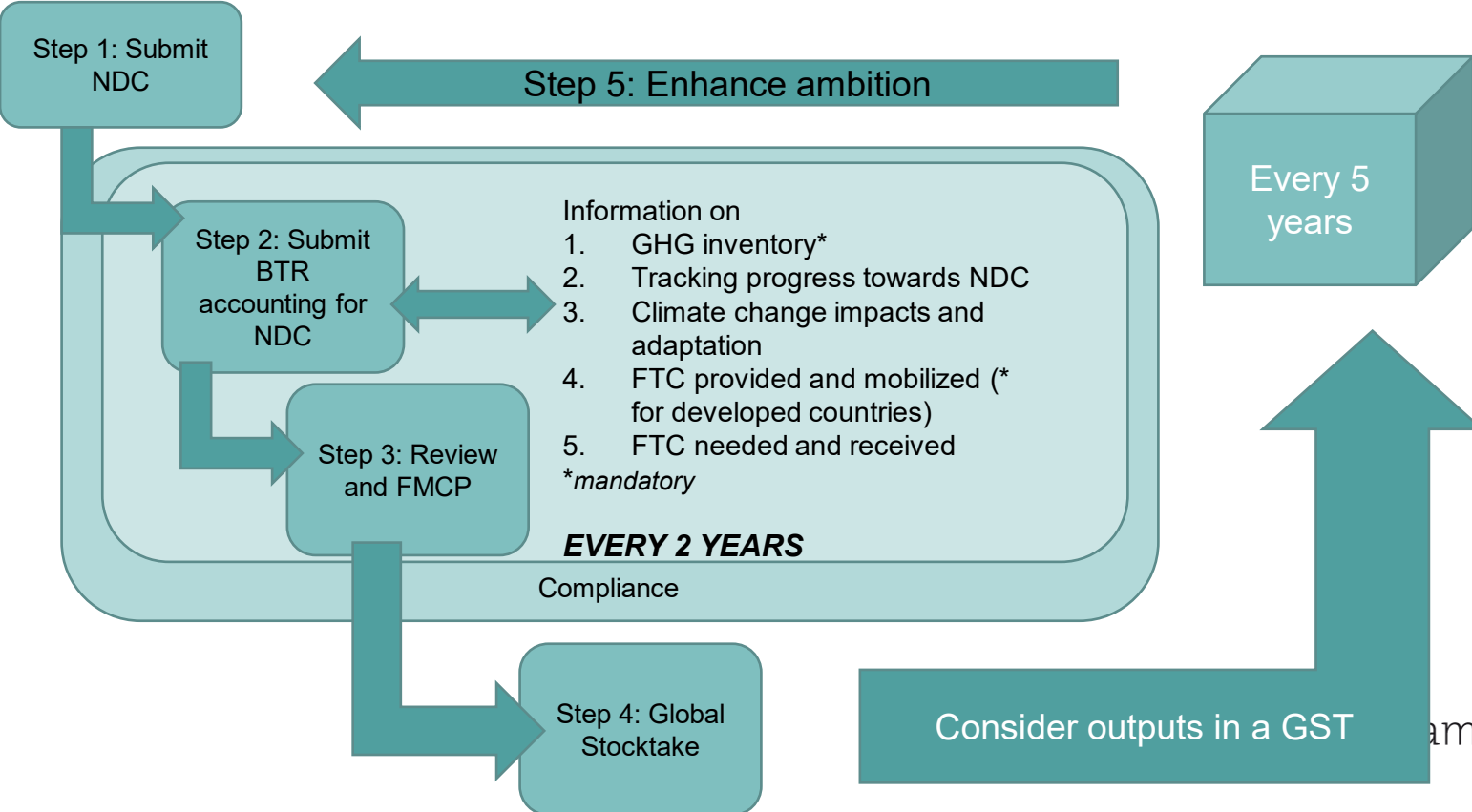


Source: [World Resources Institute](#)

THE PARIS AGREEMENT – THE BIG PICTURE



NDC CYCLE



Paris Agreement: Foundations and mechanisms

Art. 4 Nationally determined contributions

Art. 6 Cooperation

Art. 7 Adaptation

Art. 9 Financial support

Art. 10 Technology transfer support

Art. 11 Capacity building support

Art. 13 Transparency framework for action and support

Art. 14 Global stocktake

Art. 15 Mechanism to facilitate implementation and promote compliance

WHAT IS THE ENHANCED TRANSPARENCY FRAMEWORK

- Article 13 of the Paris Agreement states:
 - 1. In order to build mutual trust and confidence and to promote effective implementation (...of the Paris Agreement), an enhanced transparency framework for action and support, with built-in flexibility which takes into account Parties' different capacities and builds upon collective experience is hereby established.
 - 4. The transparency arrangements under the Convention, including national communications, biennial reports and biennial update reports, international assessment and review and international consultation and analysis, shall form part of the experience drawn upon for the development of the modalities, procedures and guidelines under paragraph 13 of this article.
 - 5. The purpose of the framework for transparency of action is to provide a clear understanding of climate change action in the light of the objective of the Convention [...] including clarity and tracking of progress towards achieving Parties' individual nationally determined contributions [...] and Parties' adaptation actions [...]



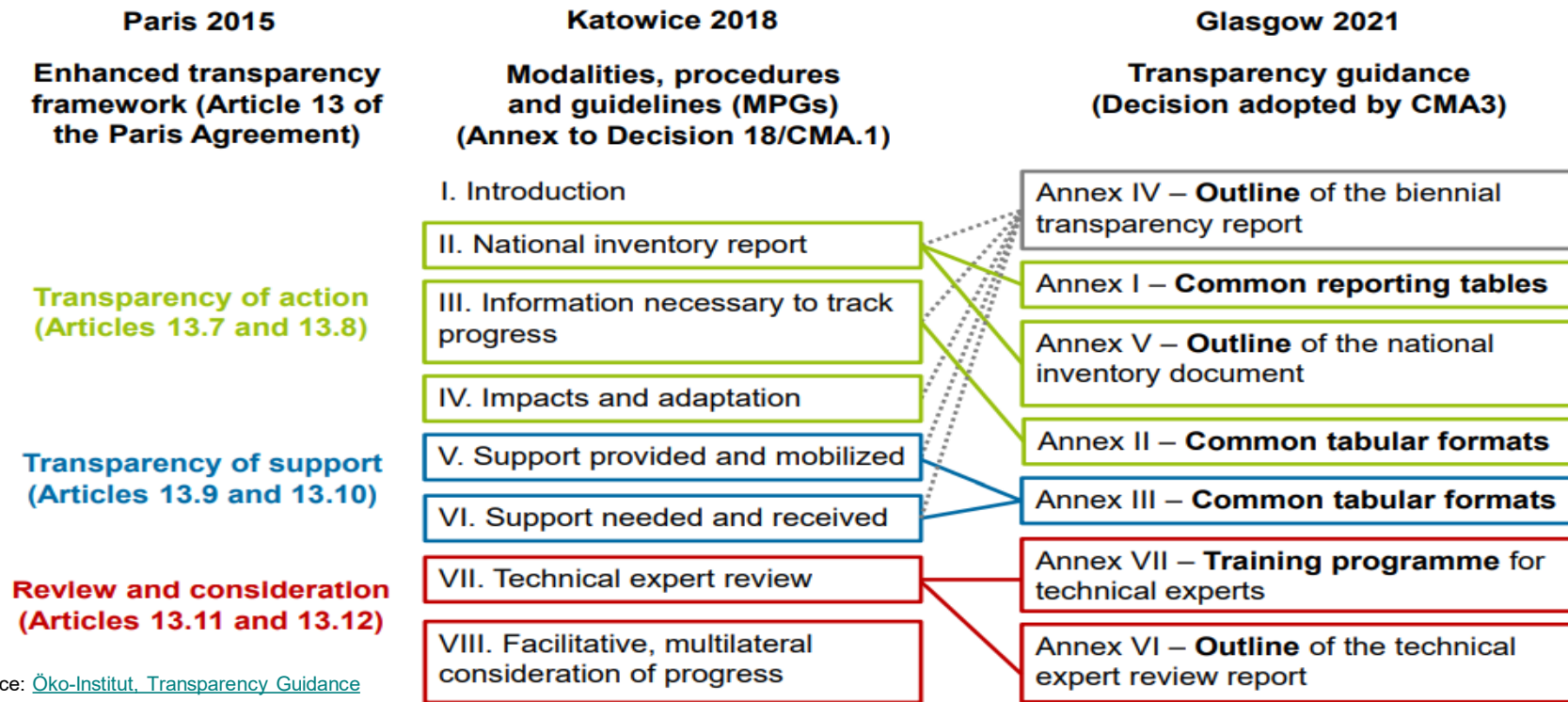
Source: [Öko-Institut, Transparency Guidance](#)



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Elements of Article 13 of the PA – Glasgow 21



OVERVIEW – NOW AND THEN

- Different requirements for developed and developing countries



- Countries have a common set of guidelines and process. Flexibility is provided for those developing countries that need it in light of their capacities, but this flexibility is bounded by the specific provisions in the guidelines. Developed countries must report on finance provided and mobilized, while other countries that contribute finance are encouraged to report on this.

- Different reporting vehicles—biennial reports for developed countries and biennial update reports for developing countries



- All countries will submit a biennial transparency report. The scope of the biennial transparency report is similar to the previous reports but has been expanded to include voluntary information on climate change impacts and adaptation (including loss & damage) and a focus on tracking progress to achieve NDCs.

OVERVIEW

- Different expert and in-person peer-review processes



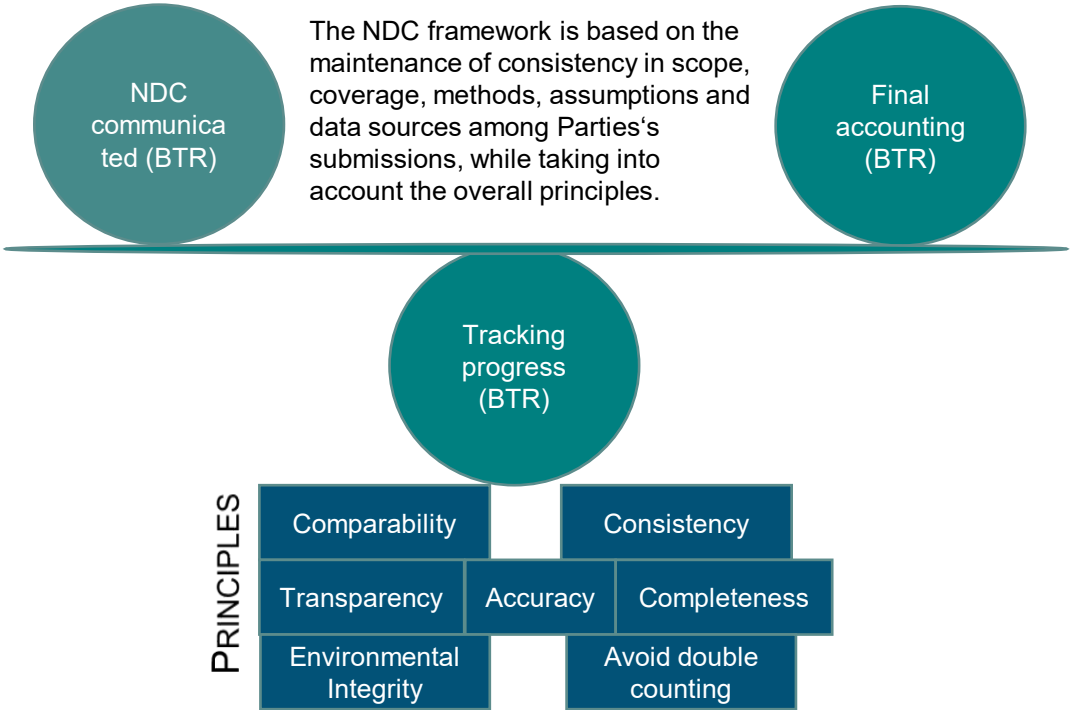
- All countries will participate in the same technical expert review and facilitative, multilateral consideration of progress. The consideration of progress will now have an online component allowing for participation from remote experts.

- Not existing process for planning improvements



- Countries must prepare an improvement plan on how they intend to improve their reporting over time.

NDC FRAMEWORK



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Paris Agreement: Foundations and mechanisms

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Overview of Article 6.2 vs 6.4

Article 6.2

- Cooperative approaches: Decentralized, country-led
- Follows CMA **guidance** (subject to review)
- Sets specific participation requirements
- Currency: ITMO (= internationally transferred mitigation outcomes)
- No SoP or OMGE

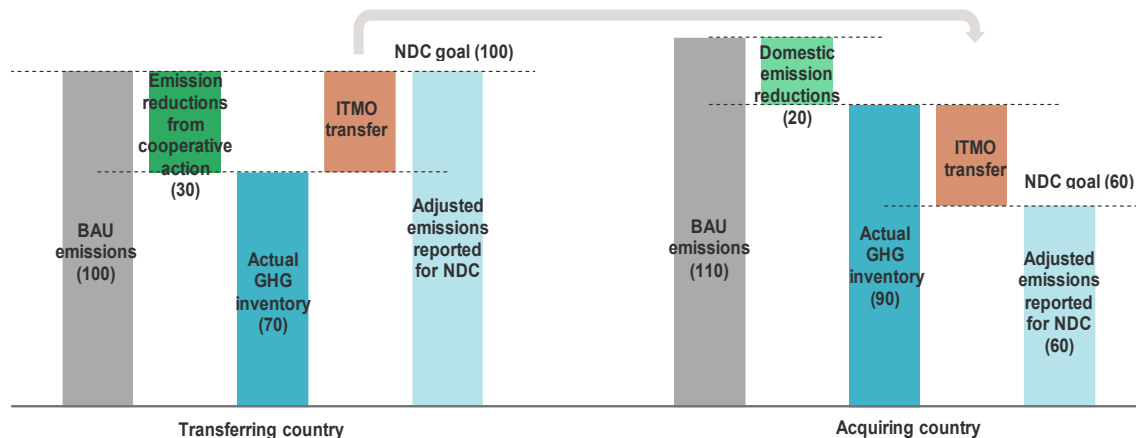
Article 6.4

- Includes mitigation activity project cycle
- Specific requirements towards baselines
- Funds adaptation and must lead to “overall mitigation in global emissions”
- Follows CMA **rules, modalities and procedures** – more like CDM rules
- Share of proceeds (5%), Overall mitigation in global emissions (OMGE, 2%)
- Currency: A6.4ER (= emission reductions), transferrable as ITMO

CMA = Conference of the Parties to the UNFCCC meeting as the Parties to the Paris Agreement

Understanding “corresponding adjustments”

- Transferred emissions are subtracted from buyer country’s GHG emissions for purposes of reporting NDC program (not actual inventory, just NDC progress)
- Similar, any transferred emission reductions are “added back” to host country’s emissions for purposes
- corresponding adjustments mentioned in Paris Agreement decision text for Article 6.2, but *both* mechanisms say there should be no double counting

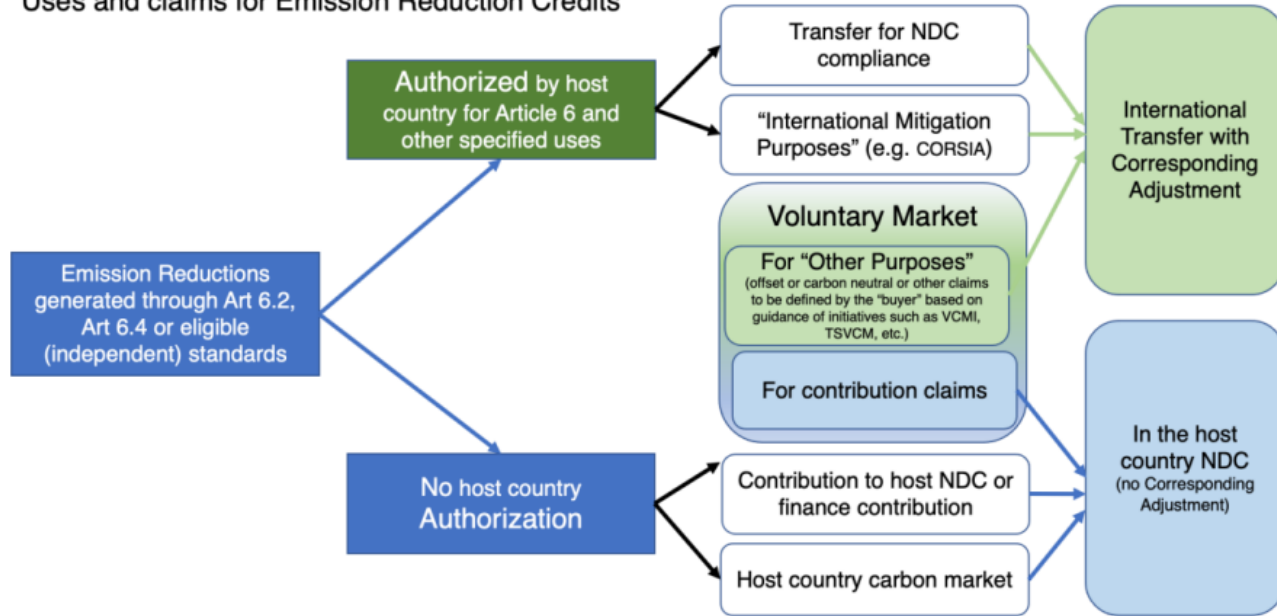


Source: Randall Spalding-Fecher

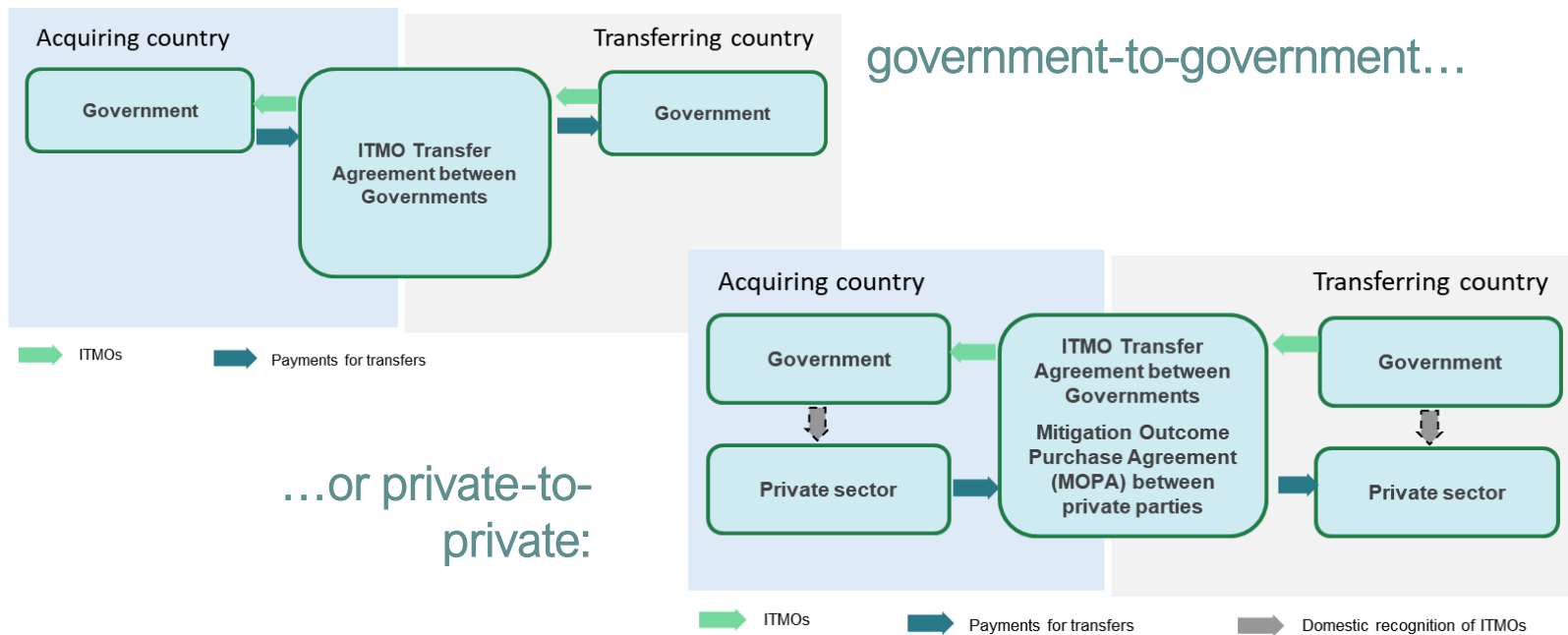
All units are equal but some units are more equal than others

Corresponding Adjustment:

Uses and claims for Emission Reduction Credits



POSSIBLE MODEL FOR ARTICLE 6.2



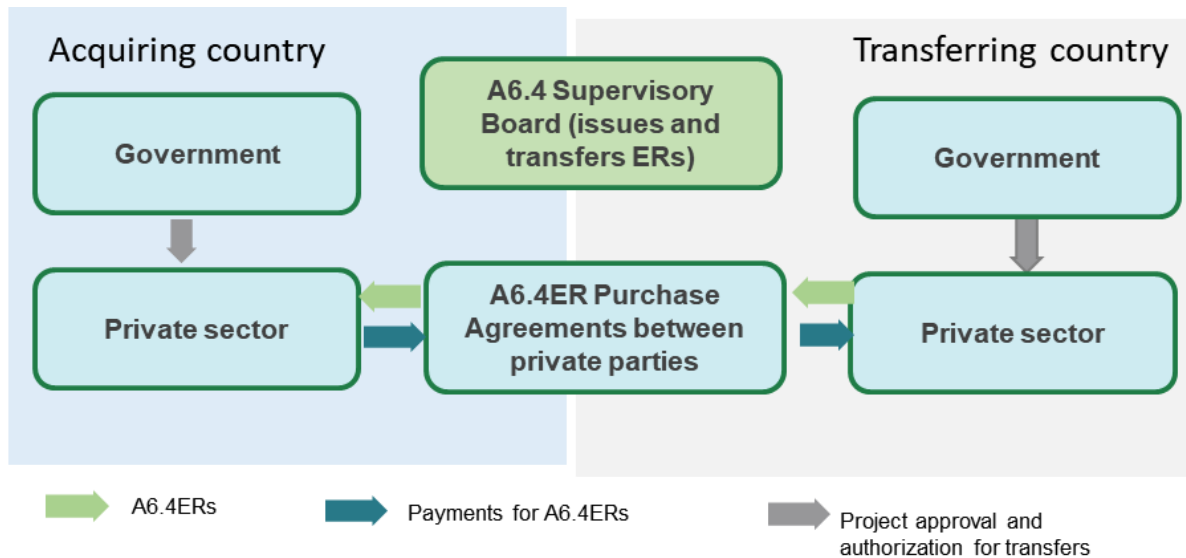
NB: many uncertainties about role of private sector in Article 6.2

Source: Randall Spalding-Fecher

Article 6.2 Participation requirements

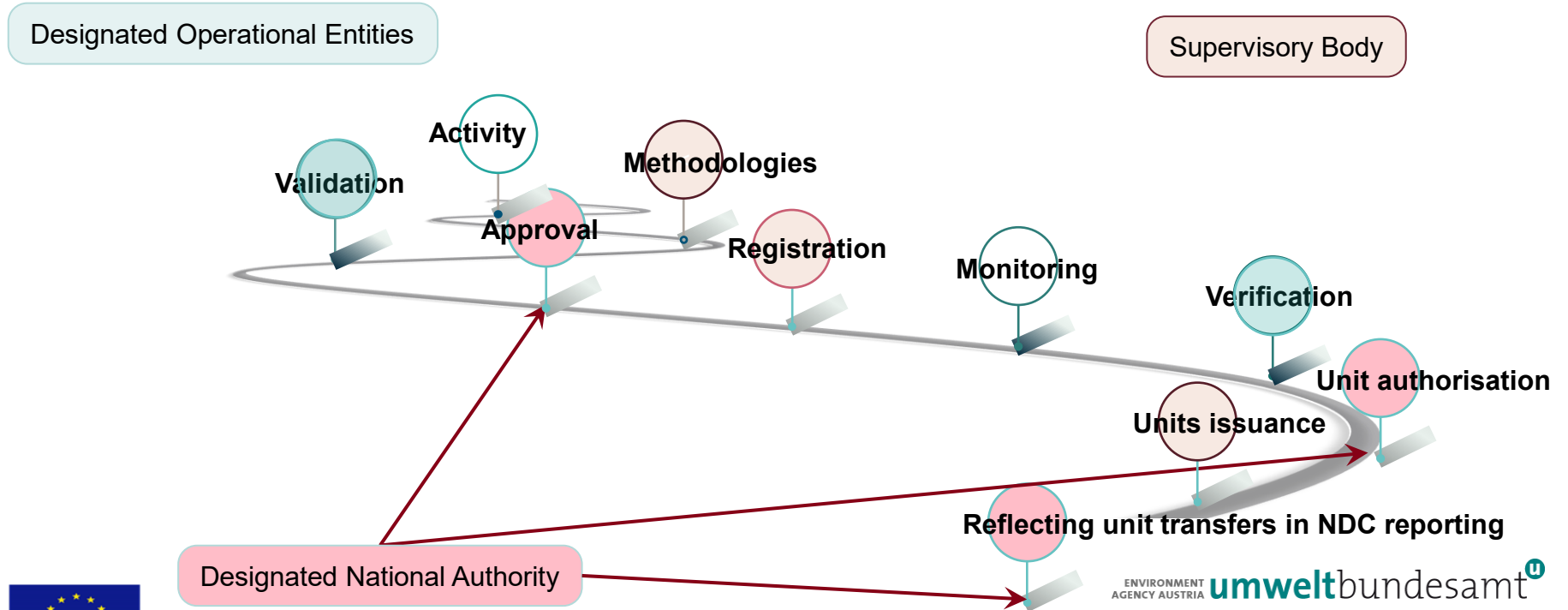
- Each participating Party shall ensure that:
 - (a) It is a Party to the Paris Agreement;
 - (b) It has prepared, communicated and is maintaining an NDC;
 - (c) It has arrangements in place for authorizing the use of ITMOs towards achievement of NDCs pursuant to Article 6, paragraph 3;
 - (d) It has arrangements in place that are consistent with this guidance and relevant decisions of the CMA, for tracking ITMOs;
 - (e) It has provided the most recent national inventory report required in accordance with decision 18/CMA.1;
 - (f) Its participation contributes to the implementation of its NDC and long-term low emission development strategy, if it has submitted one, and the long-term goals of the Paris Agreement.
- Each Party participating in a cooperative approach that involves the use of ITMOs (hereinafter referred as a participating Party) shall ensure that its participation in the cooperative approach and the authorization, transfer and use of ITMOs is consistent with the guidance and relevant decisions of the CMA and that it applies this guidance to all corresponding adjustments and cooperative approaches in which it participates.

Potential model for Article 6.4: private-to-private



A6.4ERs = Article 6.4 emission reductions

Article 6.4: Close to CDM but more complicated



Article 6 (mechanisms) links to Article 13 (transparency):

- An A6 project correspondingly adjusted by the country adds emissions to the country's NDC balance
- If project-related emission reductions are not reflected in the national inventories, the increased adjusted emissions will not be offset by reductions
- Easier to implement projects that are directly reflected in inventories through, e.g. fuel consumption
- Harder to implement projects that affect a type of emissions not directly addressed and not adjustable in national inventories



IPCC Inventory Guidelines

Revised 1996 IPCC Guidelines



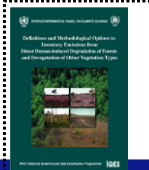
IPCC Good Practice Guidance (GPG) 2000



Good Practice Guidance for Land Use, Land-Use Change and Forestry (GPG LULUCF) 2003



Definitions and Methodological Options to Inventory Emissions from Direct Human-induced Degradation of Forests and Devegetation of Other Vegetation Types



Non-Annex I Parties

- should use Revised 1996 IPCC Guidelines (Annex to Decision 17/CP.8)
- are encouraged to use GPGs.

Non-Annex I Parties: Although not a formal request, the UNFCCC welcomes the use of the 2006 IPCC guidelines

Annex I Parties shall use the 2006 IPCC Guidelines, from 2015 onwards.

For submission under the Paris Agreement (2024 onwards) all Parties shall use the 2006 IPCC Guidelines

Annex I Parties and Non-Annex I Parties: no formal need to use the 2019 refinements

2006 IPCC Guidelines



2013 Supplement to the 2006 IPCC GL



2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol



2019 Refinements to the 2006 IPCC Guidelines

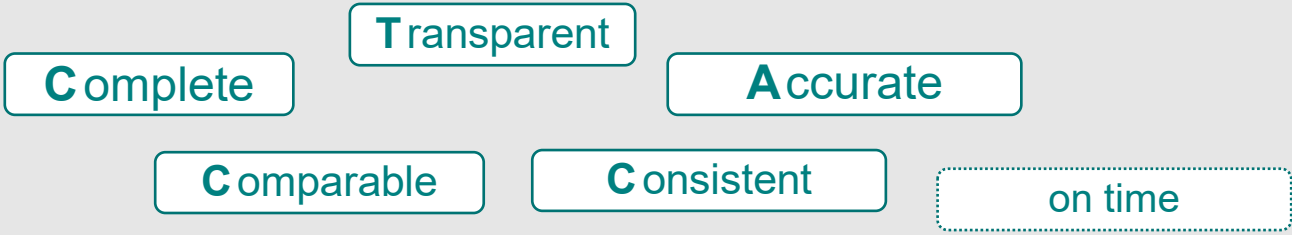


PRINCIPLE OF GOOD PRACTICE INVENTORY

Good Practice is a collection of methodological principals, actions and procedures intended to ensure that greenhouse gas inventories are accurate in the sense that they are systematically neither **over** nor **underestimates** so far as can be judged, and that uncertainties are reduced so far as possible.

Good Practice covers **choice of estimation methods** appropriate to national circumstances, **quality assurance and quality control** at the national level, **quantification of uncertainties** and **data archiving and reporting** to promote transparency. (Source: IPCC GPG)

It is *good practice* for the GHG inventory to be



PRINCIPLE OF *GOOD PRACTICE* INVENTORY

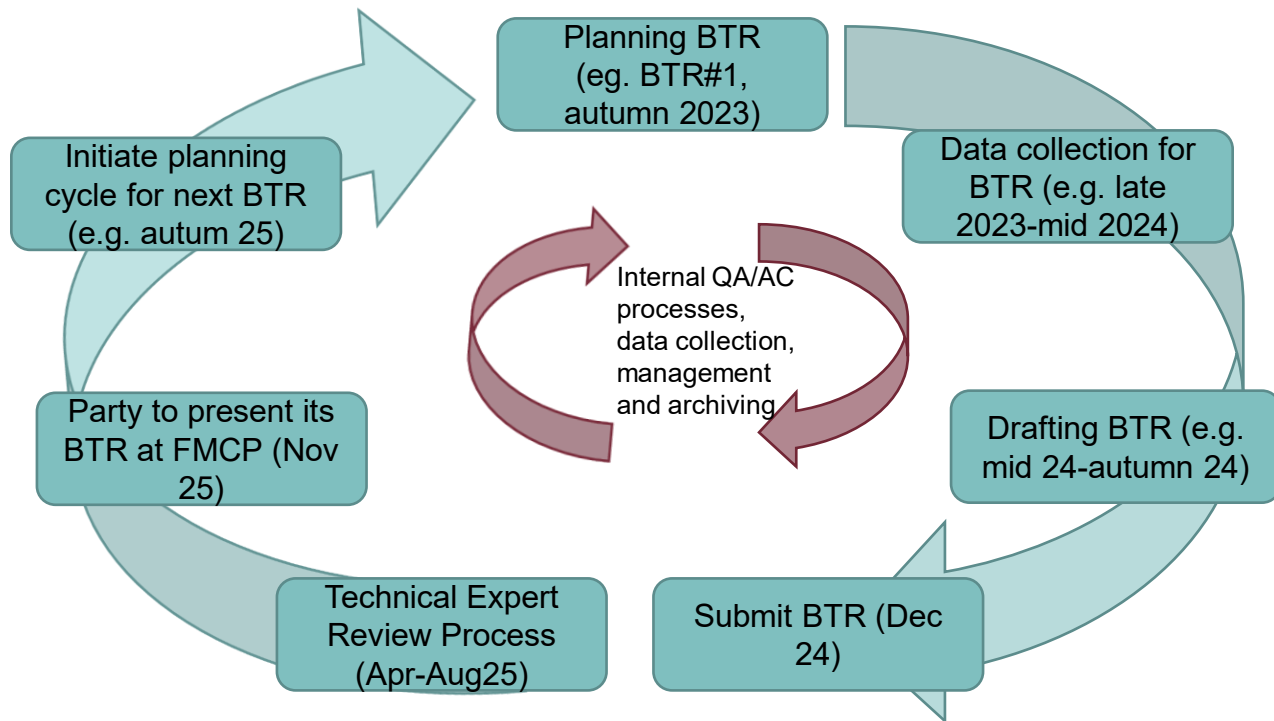
- **Transparency:** Sufficient and clear documentation exists so that individuals or groups other than inventory compilers can understand how the inventory was compiled and can assure themselves it meets the *good practice* requirements for national GHG inventories.
- **Accuracy:** neither over- nor under-estimates as far as can be judged.
- **Completeness:** Estimates are reported for all relevant categories of sources and sinks and gases.
- **Consistency:** Estimates for different inventory years, gases and categories are made in such a way that differences in the results between years and categories reflect real differences in emissions (i.e. same method and data sources for all years)
- **Comparability:** The GHG inventory is reported in such a way that allows it to be compared with other national GHG inventories from other countries.



THE GHG INVENTORY CYCLE



SUSTAINABLE SYSTEM FOR BTR



NATIONAL SYSTEMS I

- institutional, legal and procedural arrangements
 - To enable estimation and reporting of GHG emissions/removals
 - To ensure and improve the quality of the inventory
 - To ensure reporting and archiving of inventory information

→ arrangements for inventory planning, preparation and management
- Ensure sufficient capacity for timely performance of the functions (incl. arrangements for technical competence of the staff involved)
- Designate a single national entity with overall responsibility for the national inventory
- Decision 19/CMP.1 Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol

NATIONAL SYSTEMS II

- includes all institutional, legal and procedural arrangements made within a Party included in Annex I for estimating emissions by sources and removals by sinks of all GHG not controlled by the Montreal Protocol, and for reporting and archiving inventory information.
- Objectives:
 - To enable Parties to estimate emissions and removals and assist in meeting their commitments
 - To facilitate the review
 - To assist Parties included in Annex I to ensure and improve the quality of their inventories.

UNFCCC Guidelines for National Systems:
<http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf>



SINGLE NATIONAL ENTITY

The Party should have one institution that has the overall responsibility for the

- preparation of the inventory and
- assuring its quality – Responsible for ensuring that the QA/QC plan is developed and implemented
 - Definition of specific responsibilities
 - Definition of procedures for QA/QC activities (QA/QC plan)
 - Organization/Coordination of the institutions responsible for and involved in preparing the national inventory
 - In cases where estimates are prepared for the inventory compiler by outside consultants or agencies, the inventory compiler should ensure that the consultants/agencies are aware of the QC procedures outlined in the IPCC GPG

LEGAL BASIS

Example: Austrian Environmental Control Act (Federal Law Gazette 152/1998)

- **§ 5 (regulates responsibilities of the Umweltbundesamt)**

Regulates responsibilities regarding environmental control in Austria

- **§ 6 (regulates tasks of the Umweltbundesamt)**

(2)15 ...the *Umweltbundesamt* is obliged to prepare “technical expertise for *compliance* with UNECE/LRTAP Convention [...] and with the UNFCCC and the Kyoto Protocol, including the preparation of emission inventories, evaluation of the impact of measures, and assistance in preparation of reports regarding climate”.

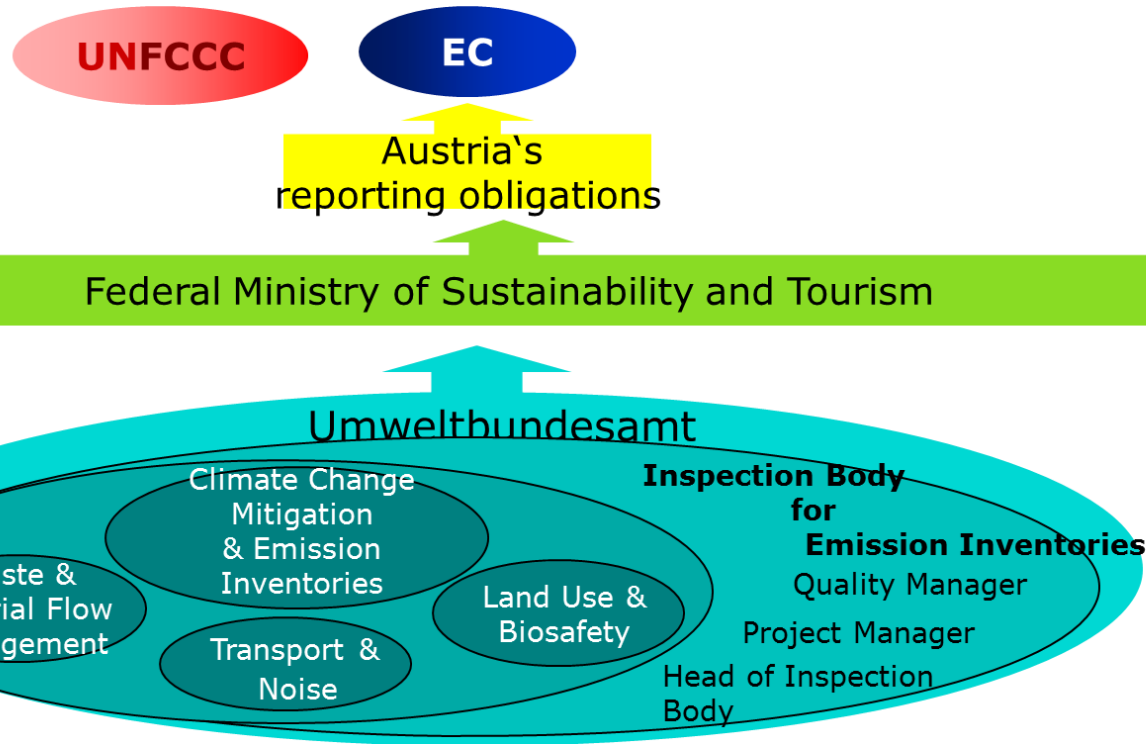
- **§ 11 (regulates financing of the Umweltbundesamt)**

...ensures financial resources for preparation of tasks as referred to in para 6.

- **§ 7 (regulates issues related to data security)**

...the Umweltbundesamt is a public authority and can therefore process (confidential) personal data and can exchange these data with other public authorities.

EXAMPLE AUSTRIA: SINGLE NATIONAL ENTITY



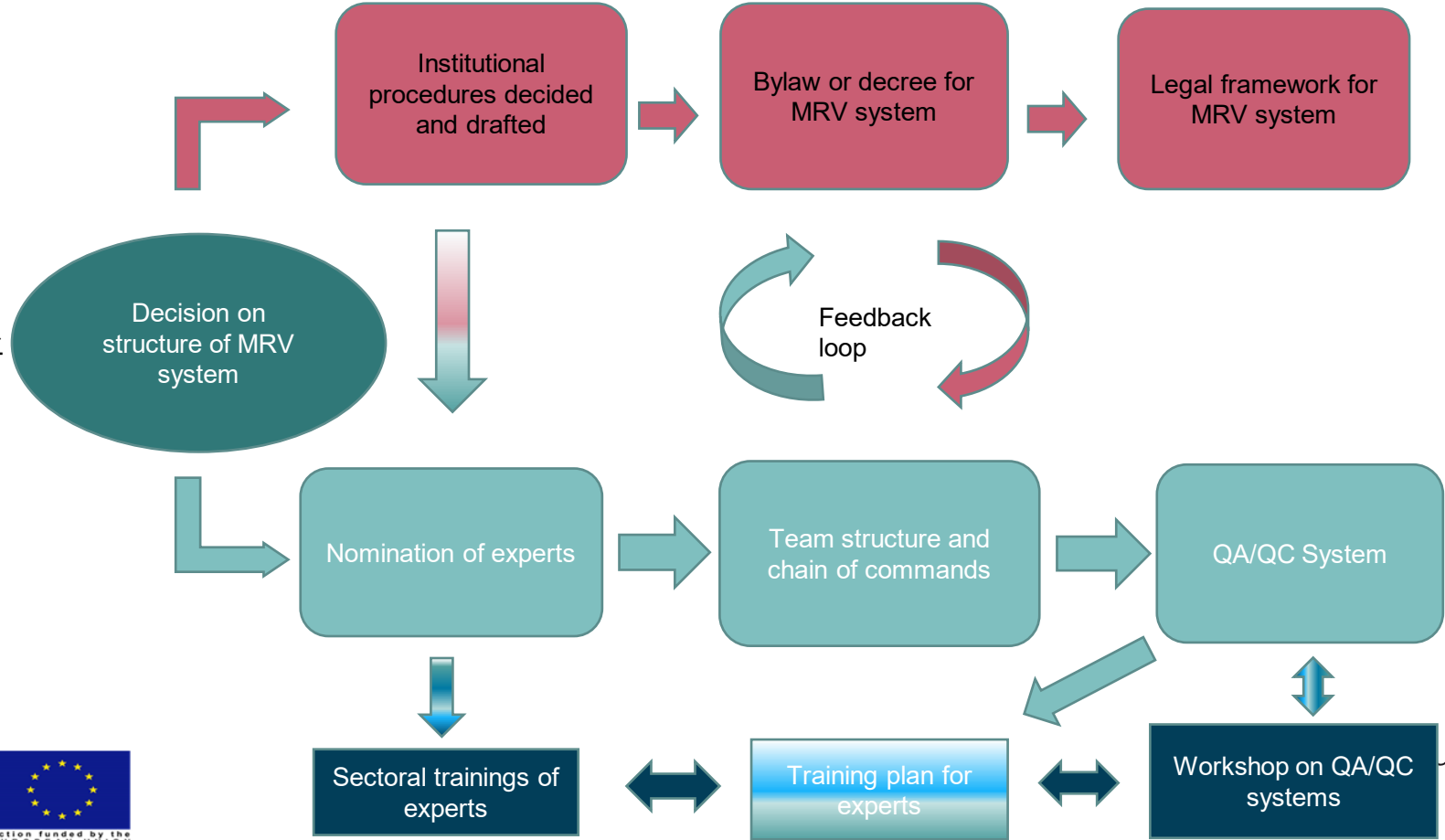
The **Inspection Body for Emission Inventories** within the Umweltbundesamt is responsible for the compilation of the Austrian emission inventory, incl. QA/QC

SITUATION IN GEORGIA – PART 1

- Ministry of Environmental Protection and Agriculture (MEPA) – Climate Change Division - is responsible entity for GHG inventory coordination
- LEPL (Environmental Protection and Education Centre) prepared most recent inventory report, project based consultants (UNDP acted as implementing agency).
- Lack of human resources, especially between inventory compilation cycles (i.e. review and improvement processes), also no deputies
- Lack of legal framework for a National System with a clear structure, with certain powers for data collection.

Roadmap Georgia

First step, ASAP



Georgian Government, outside scope/timeline of project

MRV Team/with aid throughout project



EU4Climate
Climate Fundamentals

GEORGIA ROADMAP- WHAT IS NEEDED?



DATA COLLECTION

$$E_{CO_2} = AD \times EF_{CO_2}$$

- Selecting activity data and maintaining supply
 - National Statistics Agencies
 - International organisations (UN, Eurostat, IEA etc)
 - Universities, Plants, Enterprises, Importers etc.
- Selecting emission factors and maintaining applicability
 - IPCC Emission Factor Database/Default EFs from the Guidelines
 - Scientific articles or technical reports
 - Emission factors from other NIR reports (methodology and reasoning!)
 - Measured Emissions – Implied EF

I need the energy balance data today!



METHODOLOGICAL CHOICE

- Provides a framework for deciding on methods to be applied:

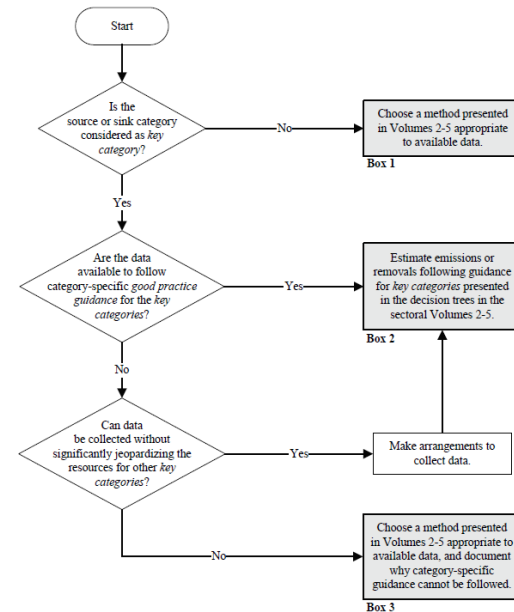
- Methodological *Tiers*
- National data availability
- Significance of the sectoral emissions in national GHG balance (*key category*)

- Key category identification:

- Approach 1 (*level and trend*)
- Approach 2 (*level and trend uncertainty*)

$$E_{CO_2} = AD \times EF_{CO_2}$$

Figure 4.1 Decision Tree to choose a Good Practice method



Source: 2006 IPCC Guidelines Vol 1 Ch 4

<https://www.ipcc.org>

TIERS

A tier represents a level of methodological complexity

- Tier 1 is the basic method

$$\text{Emissions} = \text{AD (e.g. statistics)} * \text{EF (default)}$$

- Tier 2 intermediate: e.g. AD provided by companies, EFs based on technology, country specific Efs
- Tier 3: measured data or EF based on technology/plant specific information

„higher“ tiers, applied for key categories, as they are more accurate, and avoid over- or under-estimation

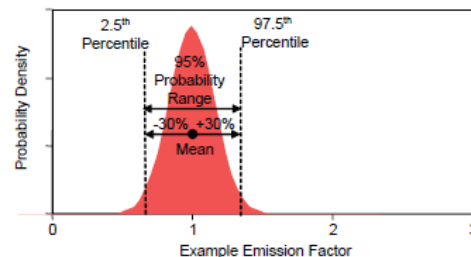
UNCERTAINTIES

$$E_{CO_2} = AD \times EF_{CO_2}$$

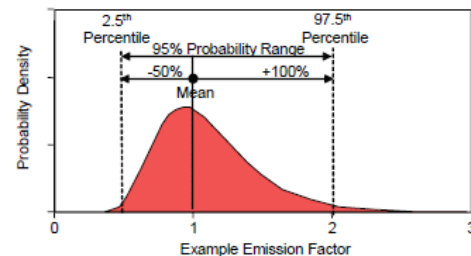
- Overview of uncertainty analysis
- Guidance on estimating uncertainty in activity data and emission factors
- Prescribes two approaches for estimating uncertainties in emissions:
 - Approach 1: Gaussian Error Propagation
 - Errors assumed to be uncorrelated and normally distributed
 - Approach 2: Monte Carlo Simulation
 - Errors distributions and error correlations defined

Figure 3.3 Examples of symmetric and asymmetric uncertainties in an emission factor

(a) Example of a symmetric uncertainty of $\pm 30\%$ relative to the mean



(b) Example of an asymmetric uncertainty of -50% to $+100\%$ relative to the mean, or a factor of two



Source: 2006 IPCC Guidelines Vol 1 Ch 3

TIME SERIES CONSISTENCY

- Ensuring consistent time series
- Resolving data gaps
 - Overlap
 - Surrogate data
 - Interpolation
 - Extrapolation

$$E_{CO_2} = AD \times EF_{CO_2}$$

Figure 5.3 Linear interpolation

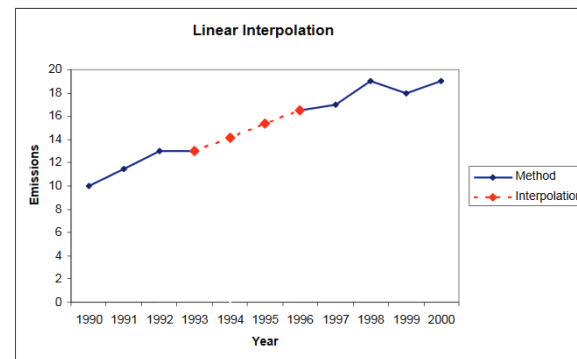
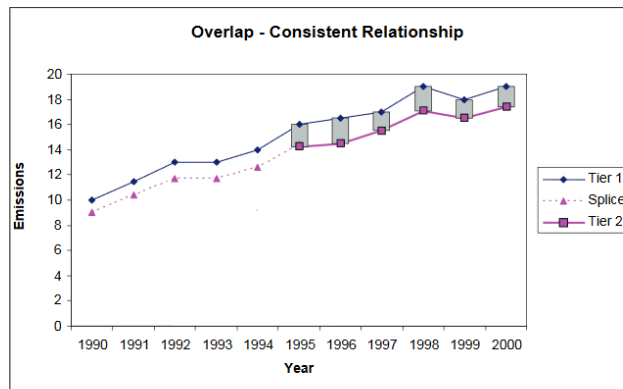


Figure 5.1 Consistent overlap



Source: 2006 IPCC Guidelines Vol 1 Ch 5

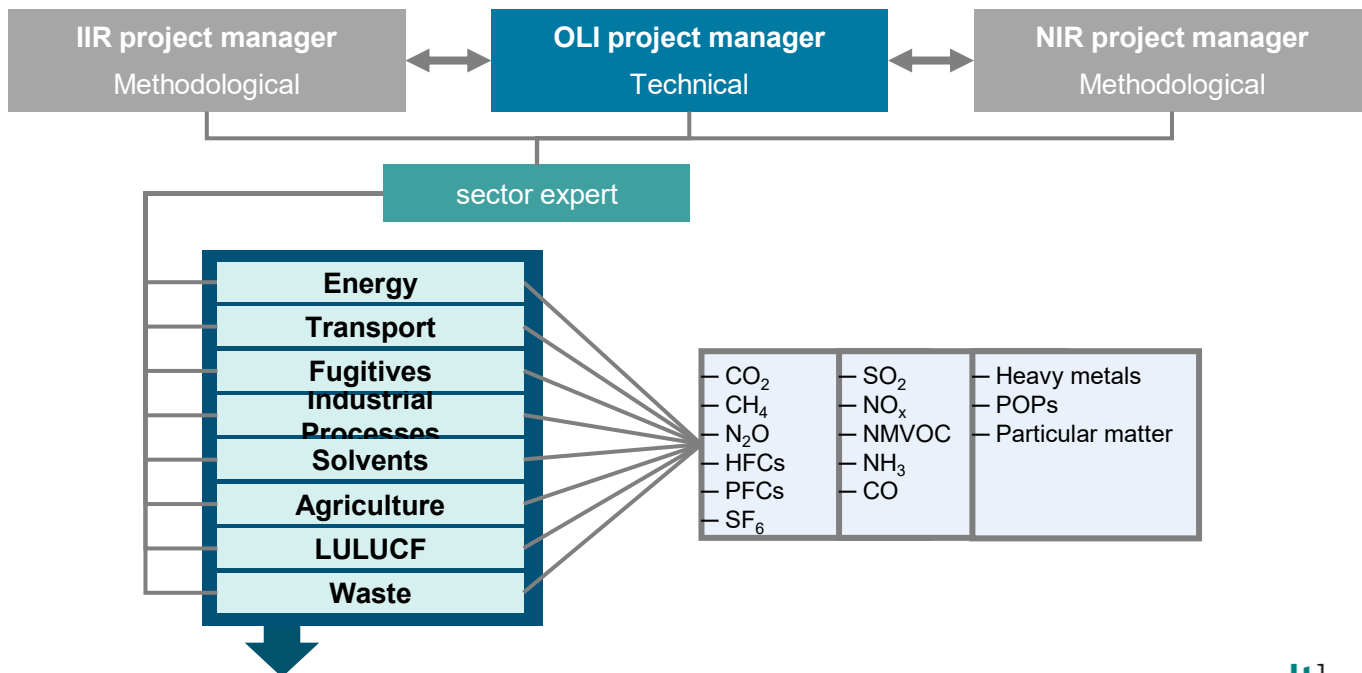
<https://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>

QA/QC AND VERIFICATION

$$E_{CO_2} = AD \times EF_{CO_2}$$

- Quality management is an essential component of a national inventory system
- Guidelines detail practical considerations in developing QA/QC systems
 - QA/QC Plan
 - General QC and QA procedures
 - Peer Review and Audits
 - Roles and responsibilities
- Verification
 - Comparison with independent inventory estimates
 - Comparison against atmospheric measurement-based emissions estimates

AUSTRIAN INVENTORY TEAM ROLES & RESPONSIBILITIES



- collecting activity data, emission factors and other relevant information
- emission estimation

- NIR/IIR report (chapter) writing
- providing background data for CRF/NFR tables
- QA/QC procedures

PREVENTIVE ACTION – AVOIDING MISTAKES

- Each function is double staffed (aim: both team members should have the same knowledge)
- All parts of inventory compilation are described in standard operational procedures (‘SOPs’)
- All excel spreadsheets used for calculations are validated
- Audits of data suppliers (at least every five years)
 - Assess quality, completeness of data and transparency of data collection
 - Goal: improve quality of data
 - Delicate task
- Regular internal meetings for information exchange and QMS training
- Participation in international working groups (WG I, WG II, etc.), conferences and reviews
- Good cooperation with other international institutions and countries (exchange of knowledge)

QUALITY CONTROL -DURING INVENTORY COMPILATION

- Sector experts
 - Collect and check activity data for plausibility (order of magnitude, time series consistency, etc.)
 - Calculate emissions in excel spreadsheets
 - Check emissions for plausibility (analysis of recalculations and documentation of reasons)
- Datamanager
 - Carries out various automatized checks (empty cells, completeness, „0“ values, ...)
 - Imports data into database
 - For greenhouse gases
 - Generates importfiles for data import into CRF reporter
 - Imports data files, logs progress of data import
 - Compares summary2 tables and original data in IBE database
 - For air pollutants
 - Creates NFR tables

QUALITY CONTROL - PART 2

- Sector experts
 - Final check of data (i.e. numerical values, notation keys, textual information) in CRF and NFR tables
 - Write corresponding sectoral chapters of reports (NIR, IIR, etc.)
- Report coordinator finalizes reports
- Sector experts check reports for consistency with CRF and NFR tables
- Report coordinator
 - Checks randomly single values for consistency with CRF and NFR tables
 - Checks conformity with requirements of EN/ISO 17020 and IPCC guidelines or EMEP EEA guidebook
- HI approves final reports
- Official submission by Ministry for Sustainability and Tourism (NFP)

Quality assurance

- By personnel **not** directly **involved** in the inventory compilation/development process
- Performed upon a **completed inventory**

NEW METHODOLOGY

- If a methodology will be changed significantly for the submission in the next year SE
 - calculates emissions based on new methodology in summer/autumn (based on activity data from last submission since latest data are not yet available)
 - use verification measures
 - present the methodology, assumptions, trends and values to national experts (expert peer review).

IMPROVEMENT PROCESS

Origins of improvements

- Quality Control
- Key source analysis
- Quality Assurance
- International review under
 - UNFCCC (Expert Review Team)
 - ESD (Technical Expert Review Team)
- Management review



Documentation of open issues in improvement list



Annual assessment regarding

- urgency
- time
- scope
- budget



Changes implemented during next inventory compilation

Issues resolved marked in improvement list



Changes NOT implemented during next inventory compilation:

- time schedule for future implementation created
- budget requested/allocated for future implementation
- remain marked as unresolved in improvement list

DATA ARCHIVING

Elements of data archiving

- Documentation of all steps of inventory preparation
- All input data are stored with a consecutive number
- All calculations are stored as excel files
- Intermediate calculation steps are stored as excel files
- The final NFR and CRF files are stored with version numbers
- At the end of inventory preparation, all files are set read-only

INVENTORY COMPILING PROCESS

Preparation of the inventory includes three stages.



Inventory planning

- responsibilities/team
- QA/QC Plan
- time schedule
- quality objectives
- established processes (official approval, etc.)
- improvement plan
- data sources
- ...

Inventory preparation

- collecting data
- emission estimation
- recalculations
- report writing
- Quality Control (QC)
- Quality Assurance (QA)
- ...

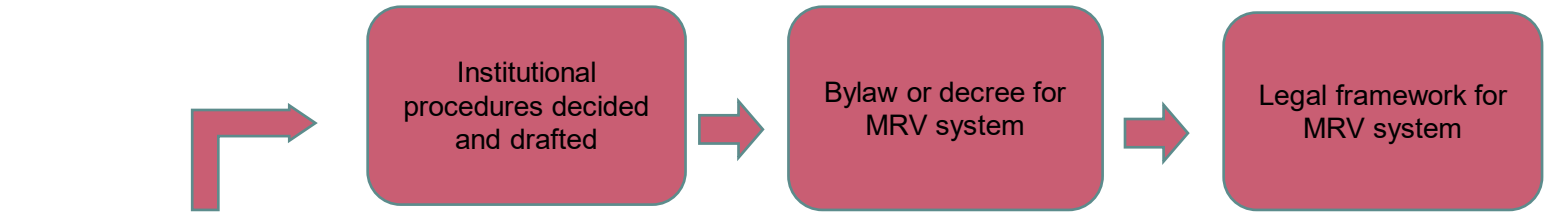
Inventory management

- data processing
- internal documentation (incl. QA/QC)
- archiving
- data storage & backup
- access authorization
- Review coordination
- ...

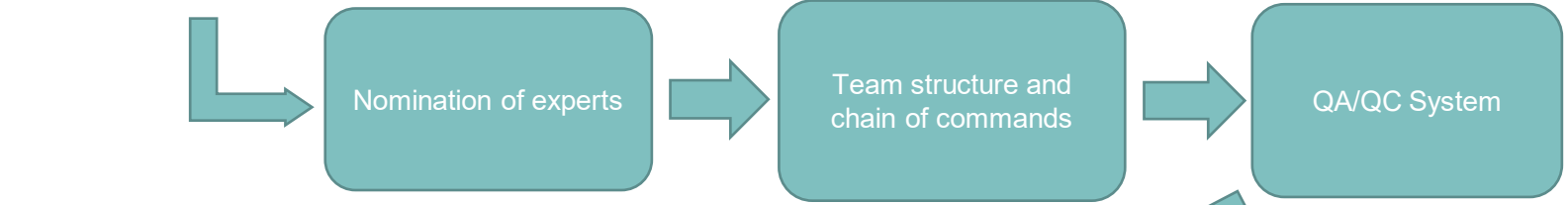
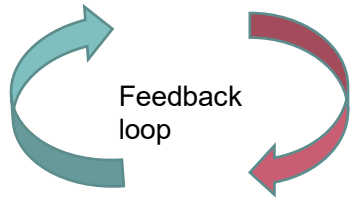
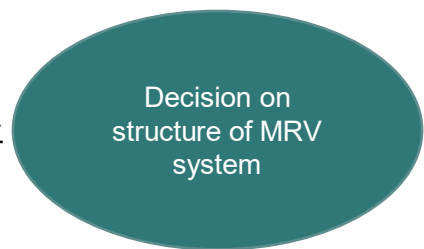
SITUATION IN GEORGIA – PART 2

- Memorandum of Understanding between MEPA and GeoStat
- No fixed QA/QC System in place
 - Lack of disaggregated data, often statistical data only allows for low tier methodology
 - Lack of certain data, especially when it comes to LULUCF sector in almost all sectors.
 - Lack of national emission factors (based on measured data, studies etc.)
 - Lack of quality checks and fallback options (deputies, stored information etc).

First step, ASAP



Georgian Government, outside scope/timeline of project



MRV Team/with aid throughout project



EU4Climate



GEORGIA ROADMAP- NEXT STEPS

- Workshop on a QA/QC system (May 2022)
- Sector specific trainings?
- What else is needed?

GEORGIA ROADMAP- WHAT IS NEEDED?



CONTACT & INFORMATION

Maria Purzner, Dr.

Climate Change Mitigation and Emissions Inventories

+43 1 313 04 5624

maria.purzner@umweltbundesamt.at

Umweltbundesamt
www.umweltbundesamt.at

Titel der Veranstaltung
Ort ● Datum



DER PRÄSENTATION