



“Building Armenia’s National Transparency Framework  
under Paris Agreement” UNDP-GEF Project/00110252

Training Day 2 | Session 7

# MRV Of GHG Emissions and Removals

# Session Structure

Section 1

Introduction to section

Section 2

Presentation (20 minutes)

Section 3

Break-out rooms for group assignment (20 minutes)

Section 4

Discussion (10 minutes)

Section 5

Presentation Q&A and close (5 Minutes)

# Section 1

Introduction to section

The Trainer

# Maia C Rossi



Maia is a sustainability professional with extensive technical expertise, a wide experience and a focus on climate change and climate finance. With a long track record in managing high-profile projects from initiation to final delivery, she is recognised for assessing climate change, environmental, socio-economic and gender impacts of large-scale development projects, design and carry out stakeholder engagement activities and managing and mentoring cross-functional teams across industries and geographies.

During her career, Maia has worked with numerous governments and companies from a variety of sectors including government agencies, intergovernmental organisations, financial services, development institutions and IFC bank, mining, oil and gas and construction across the world and in very diverse country contexts such as the UK, US, UE, the middle East and in most of the African countries.

*She is currently a PhD candidate at the Business School of the University of Bath (UK). Her research project studies the intersection between the effect of climate change on organisations and careers and focuses on risks and opportunities of transition to lower carbon economy*

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# Day 2 Basics of MRV and the Armenian Context

Session 3

MRV of GHG Emissions  
and Removals

Trainer: Maia Rossi

## Content Overview

- Preparing GHG inventory under the ETF
- National, organizational and facility levels
- Planning of GHG inventory, activity data collection, analysis and reporting
- Forest sector GHG inventory gaps and problems (activity data and reporting)
- New: particular attention to gender aspects

- MRV of GHG emissions refers to estimating, reporting, and verifying actual emissions over a defined period of time.
- This type of MRV can be performed at national level, or by organizations and facilities.
- For example, national GHG inventories include an account of emissions from a country for a particular period, are reported to UNFCCC, and undergo some form of review.
- This module will look into what already has been developed in the Armenian context and will provide insights on the main challenges and criticalities of the GHG inventory.
- MRV of emissions in regards to gender equality aspects could focus on capacity-building within inventory teams on gender equality, a brief explanation following the framework provided by the UNDP 'Gender entry point for MRV arrangements, 2020' will be provided.
- As agreed with the UNDP team, the gender aspects will be treated more in detail in the climate adaptation module.

# MRV State of the Art in Armenia

Development of Background Information for Climate Change Monitoring, Reporting and Verification (MRV) Platform Design

Final Report for UNDP-GCF Project (CBIT Project)

**March 2022**



Section 2



Presentation

# Question Time?

Could you name the four components of the MRV/ETF which should be reported in the biennial transparency report?



# Transparency Framework (ETF), art.13

The Enhanced Transparency Framework (ETF) (presented in Article 13 of the Paris Agreement) establishes some of the new reporting requirements under the Paris Agreement.

The ETF mentions both what needs to be reported and what requirements there are for reporting.

Reporting under the ETF is encouraged to take place every two years in the form of biennial transparency reports.

There are four main components to report:

1. National inventory of GHG anthropogenic emissions

2. Information to track progress of the country's NDC

3. Impacts of climate change and climate change adaptation

4. Information on financial, technology transfer and capacity-building support needed and received

# Preparing GHG inventory under ETF

# Question Time?

What are the key guidelines to develop  
and report the national inventory?

# Preparing GHG inventory under the ETF, which Guidelines?

When preparing their GHG inventories under the Paris Agreement, Parties are to follow the guidance outlined in the MPGs\*, noting also the deadline for submission of the first BTR (at the latest in December 2024 per para. 42 of decision 1/CP.24).

- ✓ The **common reporting tables (CTR)** adopted for use in reporting may be found in Annex I to decision 5/CMA.3.
- ✓ The **outline for reporting the GHG inventory information may be found in Annex V** to decision 5/CMA.3. The outline may be used in cases where the GHG inventory is included as a chapter in the BTR, as well as where it is included as a standalone document. In both cases, its use is encouraged, but not required.
- ✓ **Decision 18/CMA.1, section VII will guide the review of information on the GHG inventory** once the inventory is submitted in accordance with the MPGs.

\* [decisions 18/CMA.1](#) and [5/CMA.3](#)

## Annex V\*

### **Outline of the national inventory document, pursuant to the modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement<sup>1</sup>**

#### EXECUTIVE SUMMARY

ES.1. Background information on GHG inventories and climate change (e.g. as it pertains to the national context)

ES.2. Summary of trends related to national emissions and removals

ES.3. Overview of source and sink category emission estimates and trends

ES.4. Other information (e.g. indirect GHGs, precursor gases)

ES.5. Key category analysis (flexibility provided to those developing country Parties that need it in the light of their capacities as per para. 25 of the MPGs)

ES.6. Improvements introduced (related to a non-mandatory provision as per para. 7 of the MPGs, with flexibility provided to those developing country Parties that need it in the light of their capacities as per para. 7(c) of the MPGs)

#### **Chapter 1: National circumstances, institutional arrangements and cross-cutting information**

1.1. Background information on GHG inventories and climate change (e.g. as it pertains to the national context, to provide information to the general public)

1.2. A description of national circumstances and institutional arrangements

1.2.1. National entity or national focal point

1.2.2. Inventory preparation process

1.2.3. Archiving of information

1.2.4. Processes for official consideration and approval of inventory

# Reporting GHG inventory: Annex V to decision 5/CMA.3

## what are the components of the reporting?

### EXECUTIVE SUMMARY

ES.1. Background information on GHG inventories and climate change (e.g. as it pertains to the national context)

ES.2. Summary of trends related to national emissions and removals

ES.3. Overview of source and sink category emission estimates and trends

ES.4. Other information (e.g. indirect GHGs, precursor gases)

ES.5. Key category analysis (flexibility provided to those developing country Parties that need it in the light of their capacities as per para. 25 of the MPGs)

ES.6. Improvements introduced (related to a non-mandatory provision as per para. 7 of the MPGs, with flexibility provided to those developing country Parties that need it in the light of their capacities as per para. 7(c) of the MPGs)

# Reporting GHG inventory: Chapter 1

## Chapter 1: National circumstances, institutional arrangements and cross-cutting information, including

- 1.1. Background information on GHG inventories and climate change
- 1.2. A description of national circumstances and institutional arrangements
  - 1.2.1. National entity or national focal point
  - 1.2.2. Inventory preparation process
  - 1.2.3. Archiving of information
  - 1.2.4. Processes for official consideration and approval of inventory
- 1.3. Brief general description of methodologies and data sources used
- 1.4. Brief description of key categories
- 1.5. Brief general description of QA/QC plan and implementation
- 1.6. General uncertainty assessment
- 1.7. General assessment of completeness including total aggregate emissions considered insignificant
- 1.8. Metrics
- 1.9. Summary of any flexibility applied

National facility in place

Methodologies and data

QA/QC, uncertainties, metrics

# Reporting GHG inventory: Chapter 2, 3, 4 and 5

## Chapter 2: Trends in greenhouse gas emissions and removals

- 2.1. Description of emission and removal trends for aggregated GHG emissions and removals
- 2.2. Description of emission and removal trends by sector and by gas

## Chapter 3: Energy (CRT sector 1)

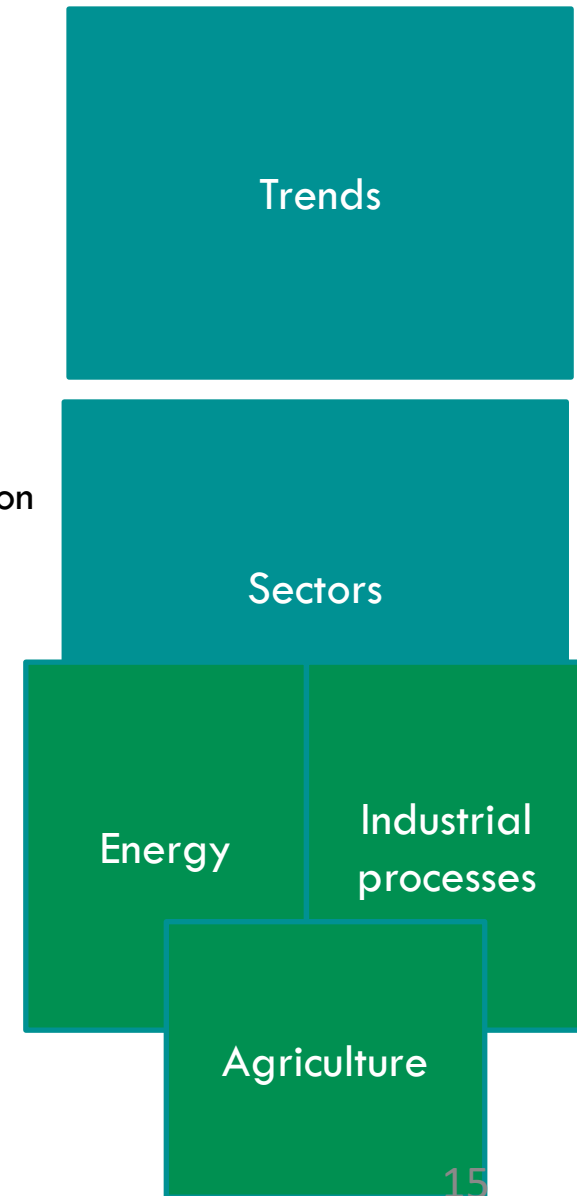
- 3.1. Overview of the sector (e.g. quantitative overview and description, including trends and methodological tiers by category) and background information
- 3.2. Fuel combustion (CRT 1.A), including detailed information on:
- 3.3. Fugitive emissions from solid fuels and oil and natural gas and other emissions from energy production (CRT 1.B)
- 3.4. Carbon dioxide transport and storage (CRT 1.C)

## Chapter 4: Industrial processes and product use (CRT sector 2)

- 4.1. Overview of the sector (e.g. quantitative overview and description, including trends and methodological tiers by category) and background information
- 4.2. Category (CRT category number)

## Chapter 5: Agriculture (CRT sector 3)

- 5.1. Overview of the sector (e.g. quantitative overview and description, including trends and methodological tiers by category) and background information
- 5.2. Category (CRT category number)



# Reporting GHG inventory: Chapter 5, 6 and 7

## Chapter 6: Land use, land-use change and forestry (CRT sector 4)

6.1. Overview of the sector (e.g. quantitative overview and description, including trends and methodological tiers by category, and coverage of pools) and background information

6.2. Land-use definitions and the land representation approach(es) used and their correspondence to the land use, land-use change and forestry categories (e.g. land use and land-use change matrix)

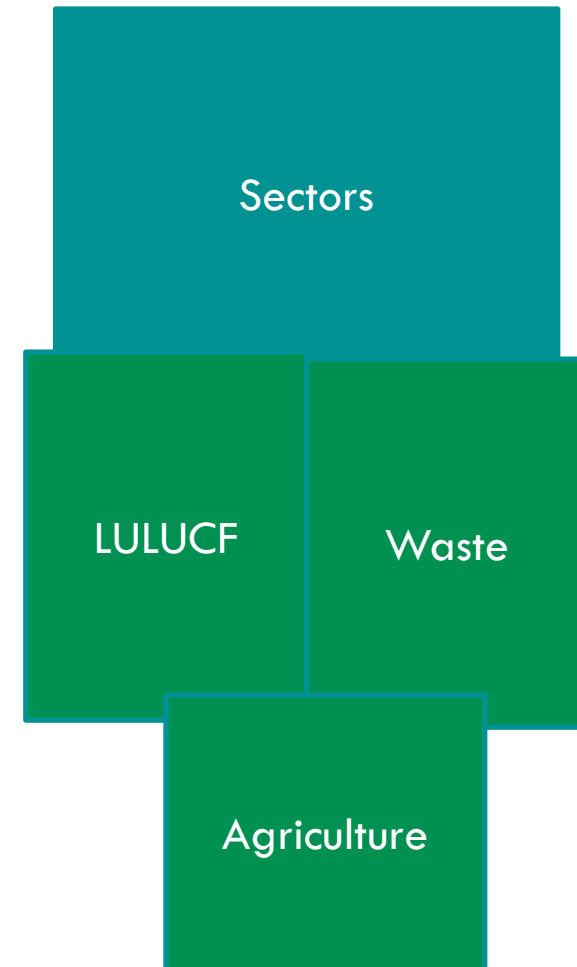
6.3. Country-specific approaches

6.4. Category (CRT category number)

## Chapter 7: Waste (CRT sector 5)

7.1. Overview of the sector (e.g. quantitative overview and description, including trends and methodological tiers by category) and background information

7.2. Category (CRT category number)





# Reporting GHG inventory: Chapter 8, 9 and 10, Annexes

**Chapter 8: Other (CRT sector 6) (if applicable)**

**Chapter 9: Indirect carbon dioxide and nitrous oxide emissions (related to non-mandatory provisions as per para. 52 of the MPGs)**

**Chapter 10: Recalculations and improvements**

## **Annexes to the national inventory document**

- Annex 1: Key categories
- Annex 2: Uncertainty assessment
- Annex 3: Detailed description of the reference approach
- Annex 4: QA/QC plan
- Annex 5: Any additional information, as applicable, including detailed methodological descriptions of source or sink categories and the national emission balance
- Annex 6: Common reporting tables

Other Sectors

Indirect emissions

Recalculations and  
improvements

Annexes

# Common reporting tables (CRT)

Common reporting tables for the electronic reporting of the information in the national inventory reports of anthropogenic emissions by sources and removals by sinks of greenhouse gases.

How do they look like? Let's have a look

<https://unfccc.int/documents/309480>

# Preparing GHG inventory under the ETF, which Guidelines?

*Some developing countries are currently using the 2006 IPCC software. Can Parties use the IPCC software to meet requirements under the Paris Agreement?*

The IPCC software is a tool to help Parties estimate GHG emissions in accordance with the 2006 IPCC Guidelines. The IPCC software is not a reporting tool.

Note: the Secretariat will develop a reporting tool for reporting GHG inventory by June 2023 \* – Parties can be involved in the test phase both for capacity building and feedback.

\* As per decision 5/CMA.3

**Task Force on National Greenhouse Gas Inventories**

ipcc  
INTERGOVERNMENTAL PANEL ON climate change  
WMO UNEP  
IPCC web sites

**Inventory Software**

**IPCC Inventory Software**

The IPCC Inventory Software implements the simplest Tier 1 methods for all sectors and Tier 2 methods for most categories under Energy, IPPU and Waste Sectors as well as Agriculture categories under AFOLU Sector in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (please see [Tier2\\_coverage.xlsx](#)). The TFI is currently working on making it compatible with the Tier 2 methods for the Land component of the AFOLU Sector.

This software has a number of improvements over the [earlier software for the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories](#), which is not supported anymore.

**Download**

- [Inventory Software Ver 2.691 \(released on 23 January 2020\)](#)  
>> It can run on MS Windows only.  
>> Please read the [note](#) carefully before using the software.
- [User Manual \(Ver 2.691\)](#)   
>> French version is available [here](#), thanks to the cooperation of Government of Belgium.  
>> Arabic version is also available [here](#), thanks to the cooperation of Sidati Ould Dah Ould EIDA (CCPNCC).
- [Release Note \(Ver 2.691\)](#)
- [Detailed information on Tier 2 coverage](#) (Tier2\_coverage.xlsx)

**Important!**

When setting the password always set the password Hint too. It is highly recommended that you take note of your password and store it in a safe place, in case you lose or forget your password, the software does not have a mechanism to restore your password, this means that you can no longer access your database.

About options for using the IPCC Inventory Software with macOS, please refer to FAQ section below.

**Support**

Help Desk: email [ipcc-software@iges.or.jp](mailto:ipcc-software@iges.or.jp)

# How do we calculate GHG emissions from sources?

Quantification method	Description	Relevant data types
Direct measurements	Direct monitoring $\text{GHG} = \text{emissions data} * \text{GWP}$	Direct emission data
Calculation	$\text{GHG} = \text{activity data} * \text{emission factor} * \text{GWP}$	Activity data Emission factors

# Question Time?

Are all Parties required to submit a  
GHG inventory as a part of the  
BTR?

**Yes.**

In accordance with Article 13. 7(a) of the Paris Agreement, all Parties must submit a GHG inventory as part of the BTR.

The GHG inventory must be developed consistent with chapter II of the MPGs, including the use of the 2006 IPCC Guidelines and following the common reporting tables in annex I to decision 5/CMA.3.

# Question Time?

Will the GHG inventory be physically submitted at the same time as the BTR?

**No.**

The GHG inventory may be submitted as a part of the BTR or submitted as a standalone document. These documents do not need to be submitted at the same time, as long as the respective deadlines are met.

For developing country Parties, this means the BTR, including the GHG inventory if a standalone document, must be submitted by 31 December in a year when a BTR is due



# Summary requirements for the National inventory report, What, Who, How and When I/II

What - sectors, activities and types of GHG:

- All standard GHG inventory categories - "key categories" that contribute to 95% [85%] of the national GHG inventory
- Three gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O); four more gases (HFC, PFC, SF<sub>6</sub>, NF<sub>3</sub>) [not required if flexibility is requested]; optional precursor reports (CO, NO<sub>x</sub>, NMVOC)
- Sectors according to IPCC guidelines: energy, industrial processes and product use, agriculture, LULUCF and waste. International aviation and marine bunker fuels as a note article.
- Time series report from 1990 [2020]
- Fuel and grid emission factors

Who - roles and responsibilities:

- Designate a national entity or coordination centre with general responsibility
- Explain the inventory preparation process, including the responsibilities of all institutions involved.
- Explain the process for official consideration and approval of the inventory

# Summary requirements for the National inventory report, What, Who, How and When I/II

How: methodologies, data sources and assumptions

- 2006 IPCC Guidelines, using the recommended level whenever possible [request flexibility for the lower level]
- Use 100-year GWP contained in the most updated IPCC assessment report (at present AR5) to convert all values to CO<sub>2</sub>e (as opposed to NCs and BURs)
- Recalculate previous years if the methodology changes significantly
- Use of common reporting tables (CRT) and common tabular formats (CTF) for the electronic reporting of the information in the NIR

When: deadlines and milestones

- Report must cover data from 2 [3] years prior to publication date (for example, 2024 report must have inventory data from 2022 [2021])
- Filing required every two years, with first filing in 2024

# National, organisational and facility levels in Armenia

# The fundamental questions – institutional arrangements

- **Which organizations will be involved in implementation?**

Based on current experience under the Convention, in most countries, one single government entity has the overall responsibility to submit reports to the secretariat; however, that entity probably coordinates with multiple other entities at the national and/ or subnational level (including government agencies, industry organizations, educational institutions, research organizations and other interested stakeholders).

- **What types of arrangements could be established among these interested stakeholders?**

Formal agreements can be helpful to establish a sustainable process, for example for collecting the necessary underlying data (e.g. activity data for the GHG inventory or specific indicators for tracking progress).

- **Is there a need to establish a regulatory framework to support information collection or policy implementation?**

- **What type of information management system can be developed?**

BTRs are due every two years and NDCs are to be communicated every five years. A successful domestic framework is one in which each successive submission builds on the work of the previous submission.

# The case of Ukraine\*

**Ministry of Ecology and Natural Resources of Ukraine - MEPR** is the main body for climate change field in Ukraine since 2020.

- It is entitled to develop climate-related policies, evaluation, coordination, organization and monitoring of climate-related planning documents and strategies
- MEPR is also responsible for developing and issuing of regulations in the field of climate change as regards adaptation and increase of resistance to climate change and determination of methods for estimating anthropogenic GHG emissions by sources and removals by sinks.
- Preparation, approval, and submission of national reports as committed under the UNFCCC, KP and the PA also falls under the competence of MEPR.

Nonetheless, Ukraine is missing explicit legal provisions **devoted to reporting and responsible institutions.**

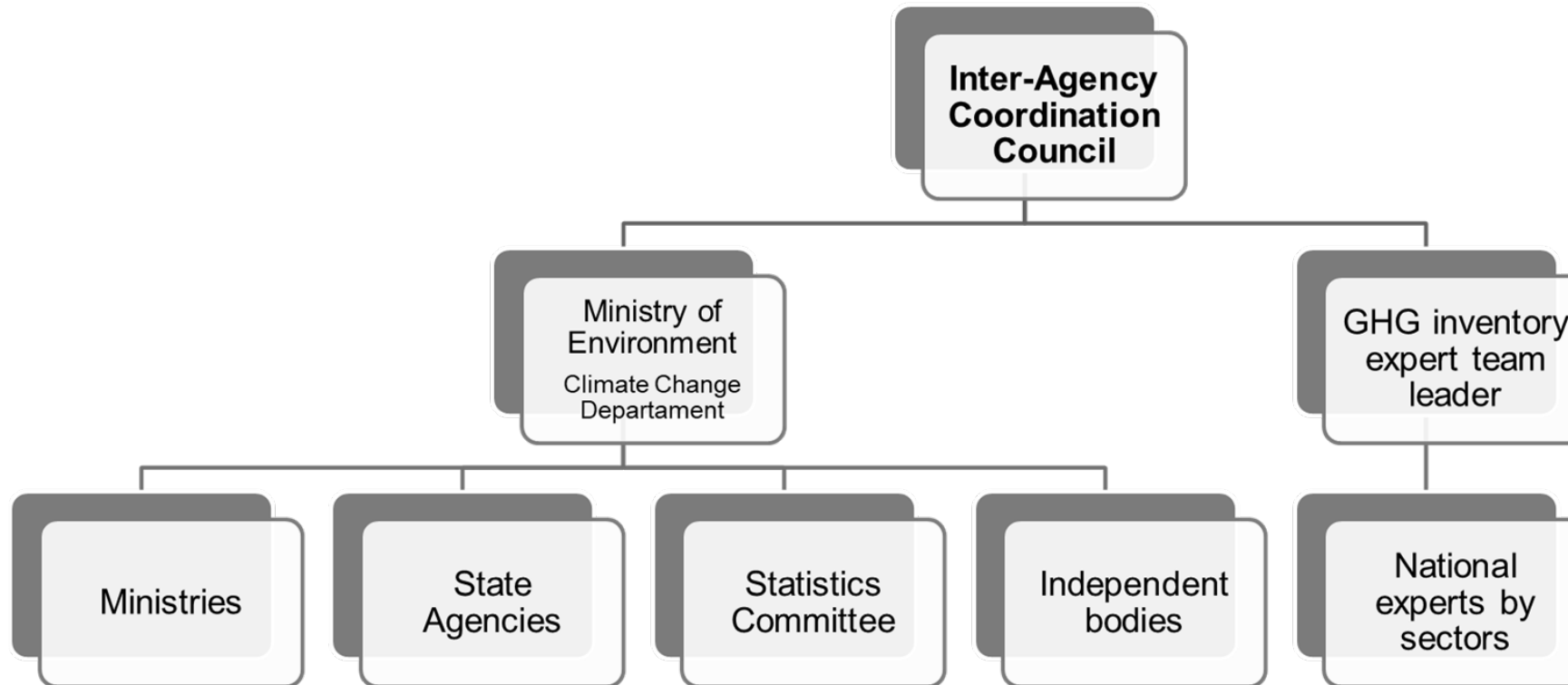
**There are plans to** determine roles, functions and competences and in particular:

- 1) define respective state authorities entrusted with **the reporting on policies and measures and projections of anthropogenic GHG emissions** by sources and removals by sinks
- 2) establish clearly differentiated functions and roles of responsible entities **between two reporting streams** (they follow EU regulations)
- 3) designate responsible authorities for the process behind the selection of assumptions, methodologies and models used, including for the implementation of quality assurance and quality control activities

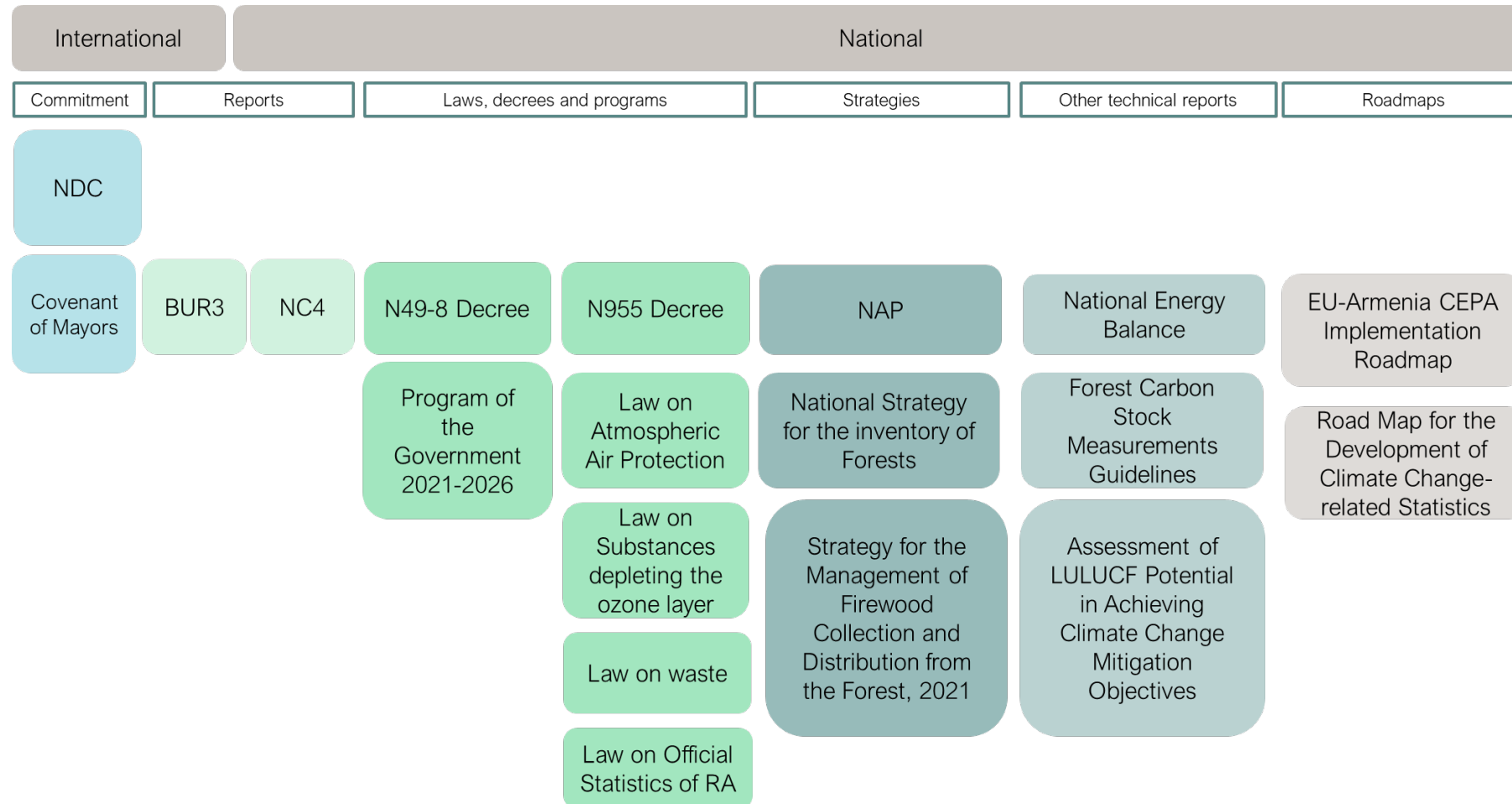
# Question Time?

What are in your opinion the key entities for GHG inventory in Armenia?

# Current institutional arrangements to address climate change national policy



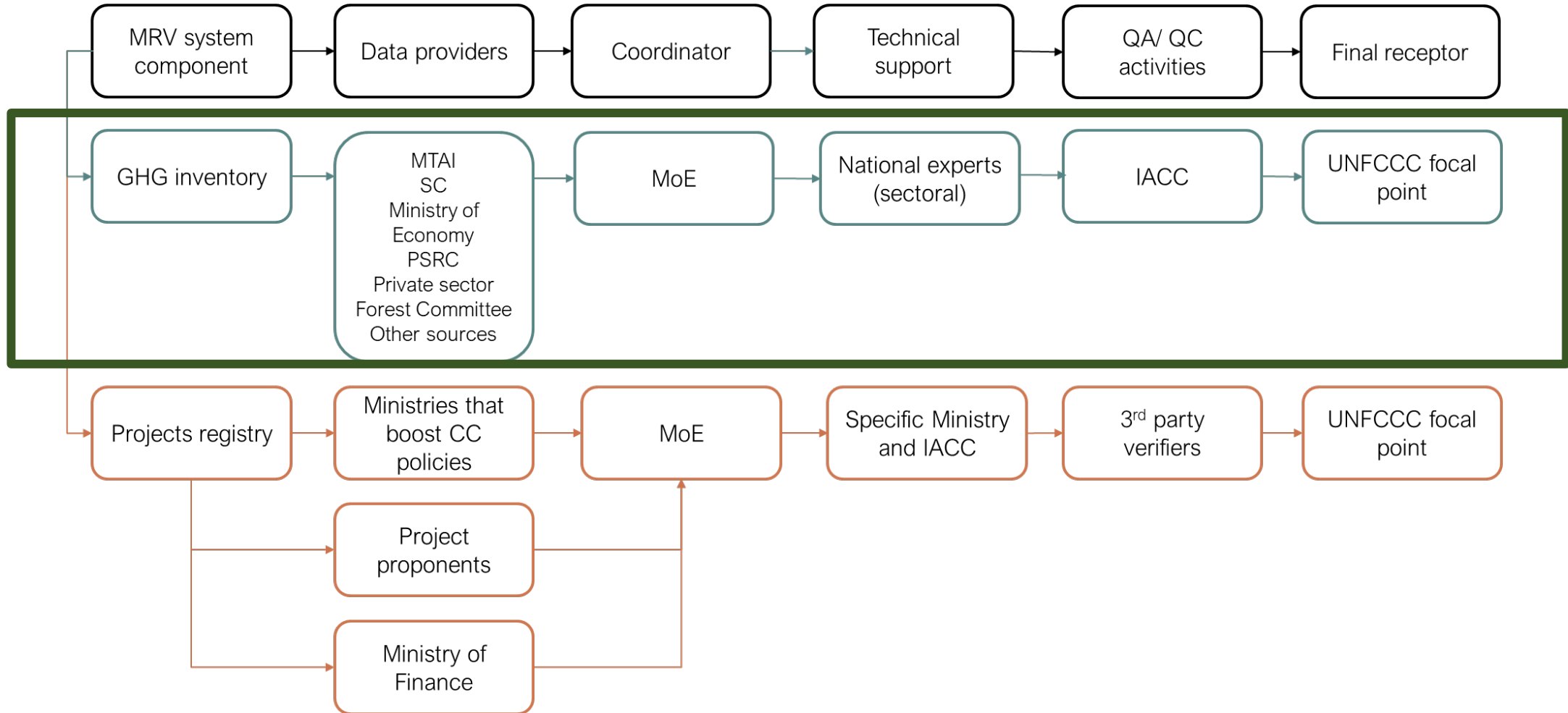
# Climate policy related instruments and reports in Armenia



Source: Development of Background Information for Climate Change Monitoring, Reporting and Verification (MRV) Platform Design, Carbon Limits, 2022



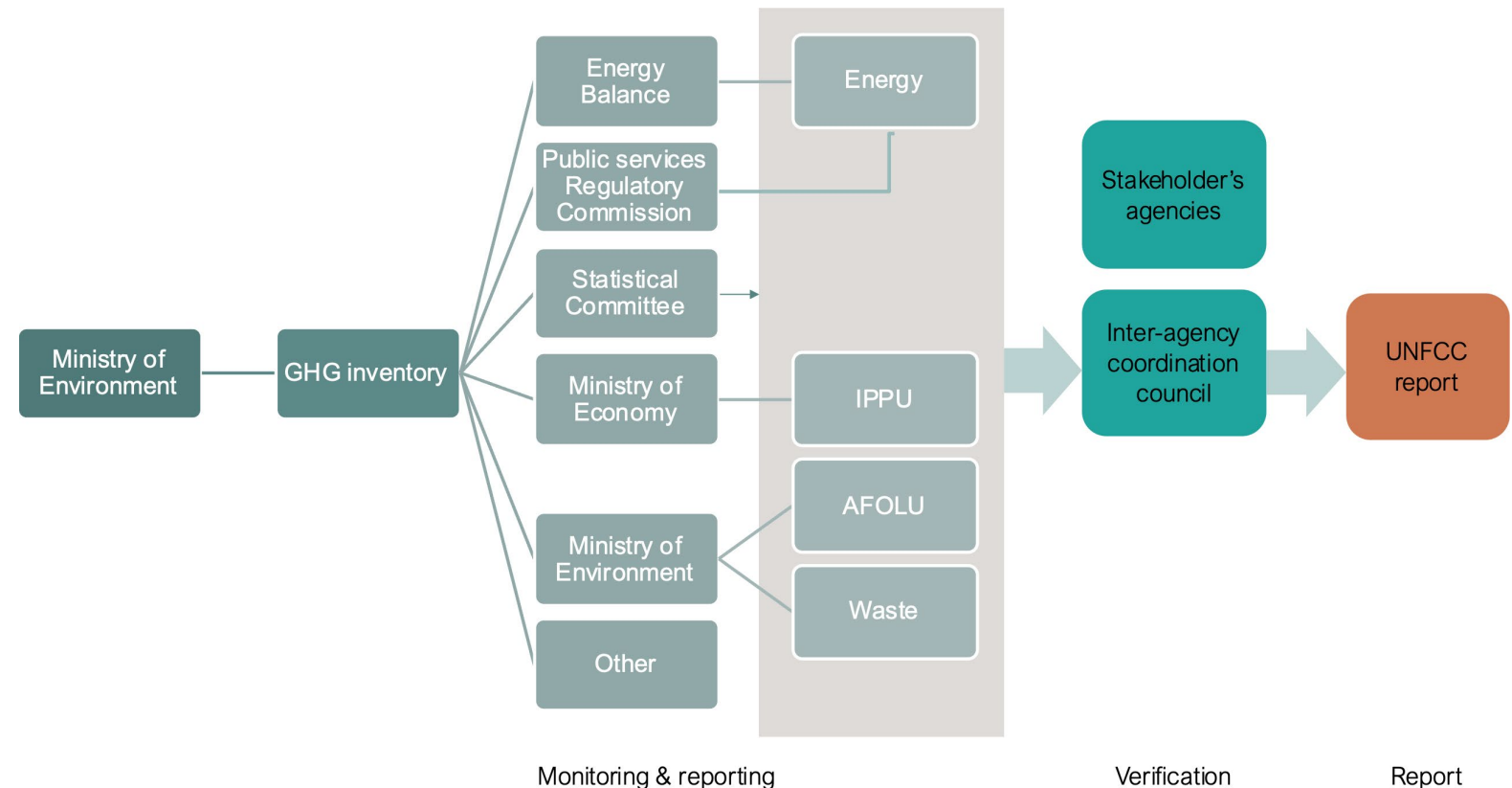
# Institutional and data mapping of the MRV system



# Institutional arrangements for GHG inventory in Armenia

Ministry of the Environment is the entity responsible for preparing the inventory and to coordinate the main information providers in the different sectors.

Likewise, it points out that the integration of the inventory implies the review of specific agencies and the IACC before sending it to the UNFCCC.



# Institutional arrangements for GHG inventory in Armenia

The current institutional arrangements are not official but have allowed the systematic realization of a precise GHG inventory for compliance with international obligations\*.

AFOLU: Agriculture, Forestry and Other Land Use

IACC: Inter-Agency Coordination Council

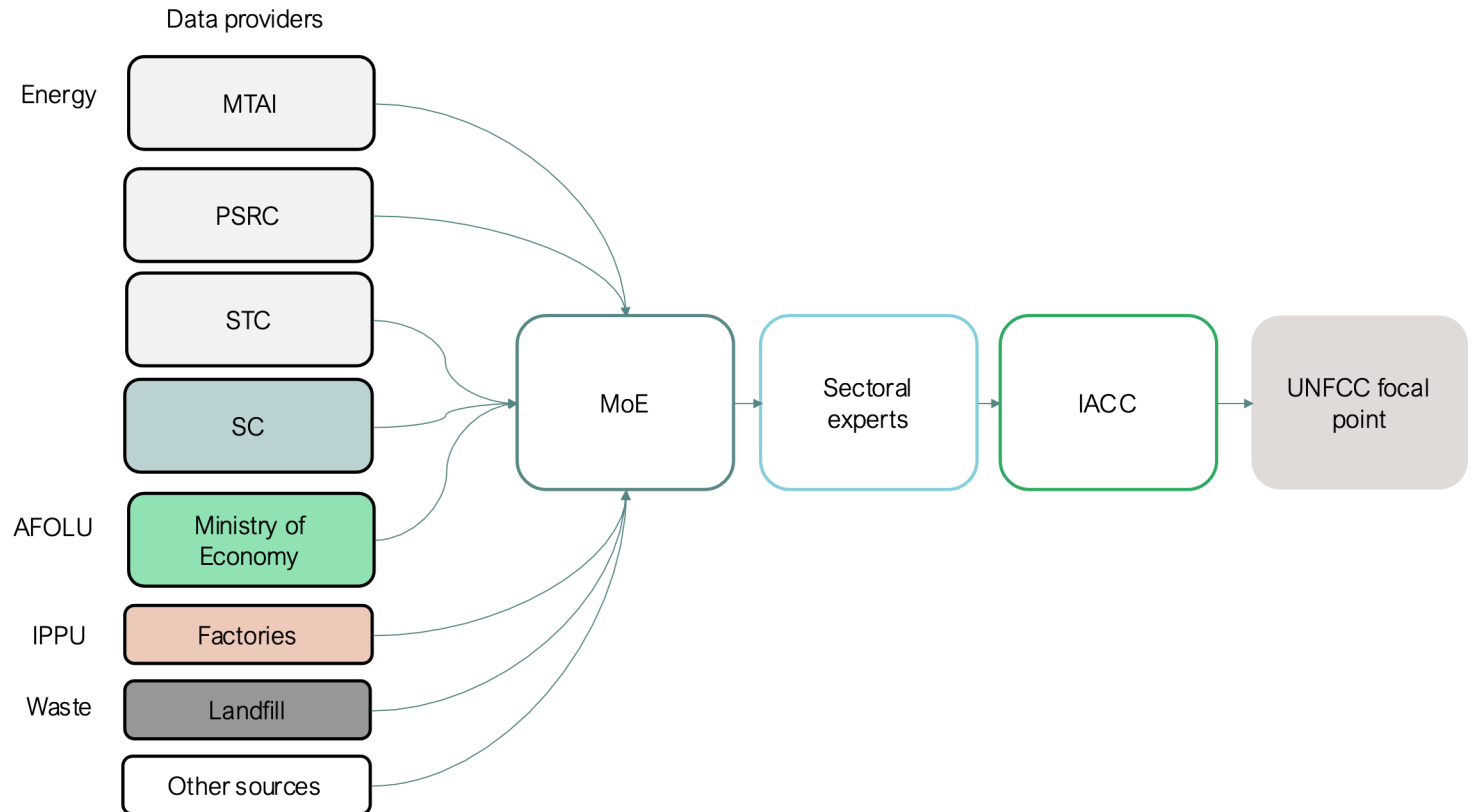
IPPU: Industrial processes and product use

MoE: Ministry of Environment

MTAI: Ministry of Territorial Administration and the Infrastructure (MTAI) of Armenia.

PSRC: Public Services Regulatory Commission

SC: Statistics Committee



Note: \* However, it should be considered that the MRV system will also include, in addition to the inventory, the monitoring of mitigation and adaptation actions, as well as the financing required and obtained for the implementation of climate policies.

Source: Development of Background Information for Climate Change Monitoring, Reporting and Verification (MRV) Platform Design,

# Planning GHG inventory, data collection, analysis and reporting

# GHG Inventory in Armenia

**The national GHG inventory is used to quantify the country's GHG emissions in the sectors: Energy, IPPU, AFOLU and Waste, which has been carried out from 1990 to 2017.**

The estimates of each sector in the different categories require various efforts for the generation, compilation, validation, management and safeguarding of information, in addition to the application of specific methodologies.

In the case of Armenia, the inventory uses the 2006 IPCC guidelines.

The national GHG inventory includes carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrochlorofluorocarbons (HFCs) and sulphur hexafluoride (SF<sub>6</sub>) and they are expressed in units of mass and by carbon dioxide equivalent (CO<sub>2</sub> eq.) using the Global Warming Potentials (GWPs) in the IPCC Second Assessment Report (SAR).

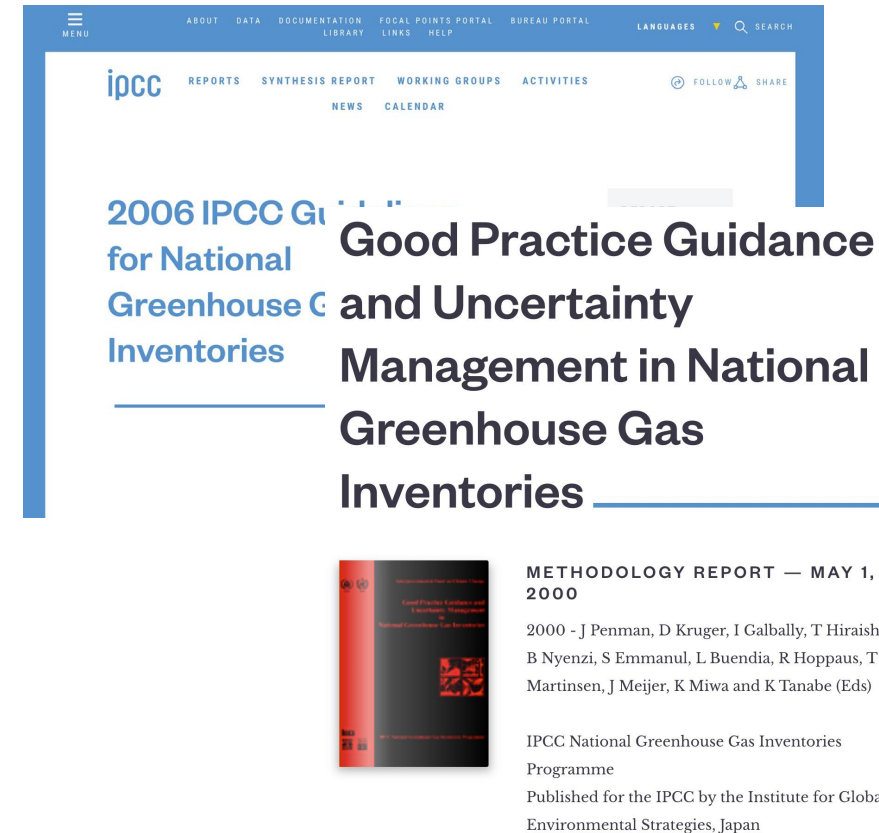
# GHG Inventory in Armenia, 2017

In 2017, the national GHG emissions were 10,624 Gg CO<sub>2</sub> eq. (excluding Forestry and Other Land Use) and net emissions including sinks were 10,153 Gg CO<sub>2</sub> eq. 3% higher than the previous year, due to:

- Increasing in power generation – exports
- Cold winter (residential sector)
- More energy for transportation due to vehicle fleet growth
- Increasing of construction sector – more cement volume required

# GHG Inventory in Armenia: applied methodologies

- [2006 IPCC Guidelines for National Greenhouse Gas Inventories](#). The IPCC Inventory Software version 2.69.7235 was used for data entry, emission calculation, results analysis and conclusions.
- [Good Practice Guidelines and Uncertainty Management in National Greenhouse Gas Inventories](#)” (IPCC 2000)
- [“Good Practice Guidelines for Land Use, Land Use Change and Forestry”](#) (IPCC 2003) and
- [2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetland](#)
- [“1996 IPCC Revised Guidelines for National Greenhouse Gas Inventories”](#)



Source: Development of Background Information for Climate Change Monitoring, Reporting and Verification (MRV) Platform Design, Carbon Limits, 2022

# GHG inventory covered sectors

Energy	IPPU	AFOLU	Waste
<ul style="list-style-type: none"> <li>• Main Activity Electricity and Heat Production</li> <li>• Residential</li> <li>• Commercial / Institutional</li> <li>• Manufacturing Industries and Construction</li> <li>• Agriculture/Forestry/ Fishing/ Fish Farms</li> <li>• Road transportation</li> <li>• Other transportation</li> <li>• Fugitive emissions</li> </ul>	<ul style="list-style-type: none"> <li>• Mineral Industry - cement, lime and glass production</li> <li>• CO<sub>2</sub> emissions generated from lubricant and paraffin use, emissions of F-gases (HFCs) from refrigeration, air conditioning and other product use, as well as</li> <li>• Emissions of SF<sub>6</sub> from use of electrical equipment.</li> </ul>	<p>Agriculture</p> <ul style="list-style-type: none"> <li>• Urea application, CO<sub>2</sub></li> <li>• Biomass burning, CH<sub>4</sub></li> <li>• Indirect N<sub>2</sub>O Emissions from manure management, N<sub>2</sub>O</li> <li>• Manure Management, N<sub>2</sub>O</li> <li>• Manure Management, CH<sub>4</sub></li> <li>• Managed soils, N<sub>2</sub>O</li> <li>• Enteric Fermentation, CH<sub>4</sub></li> </ul> <p>Forestry and Other Land Use (Land category)</p>	<ul style="list-style-type: none"> <li>• Solid Waste Disposal</li> <li>• Incineration and Open Burning of Waste</li> <li>• Wastewater Treatment and Discharge</li> </ul>

Source: Development of Background Information for Climate Change Monitoring, Reporting and Verification (MRV) Platform Design, Carbon Limits, 2022



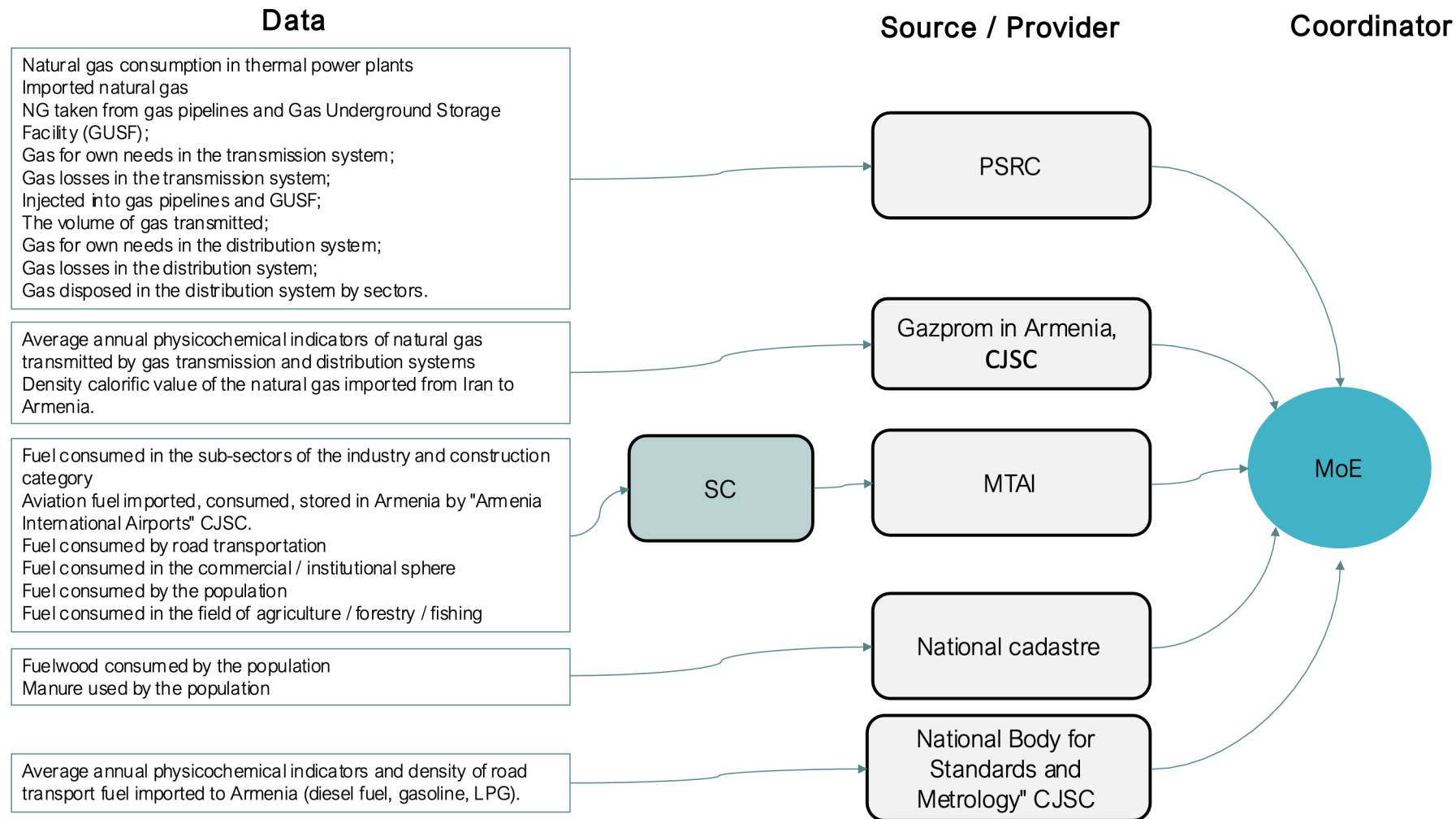
# Data Collection for GHG inventory in Armenia: process



- Depending on whether or not the emissions category in question is a main source of emissions
- Based on IPCC's 2006 inventory preparation guidelines
- Priority is given to use of national data sources and emissions coefficients
- Review and selection of data sources carried out by the relevant experts
- Information from Statistics Committee (e.g. Energy Balance)
- MoE make requests of information to other providers
- Information is provided to MoE.
- QA/QC processes
- Data achieving both as hard copies and in electronic format.
- Selection of emission factors
- QC of emissions estimates
- Preparation of reports
- Approval by the relevant experts
- Aggregation of emissions data for the national trend tables and preparation of data tables for the NIR
- Compilation of submitted sectorial report texts to form a draft NIR
- QA/QC of the draft NIR
- Review and verification of the draft NIR by the Inter-agency Coordinating Council
- Handover to the UNFCCC Secretariat
- Archiving

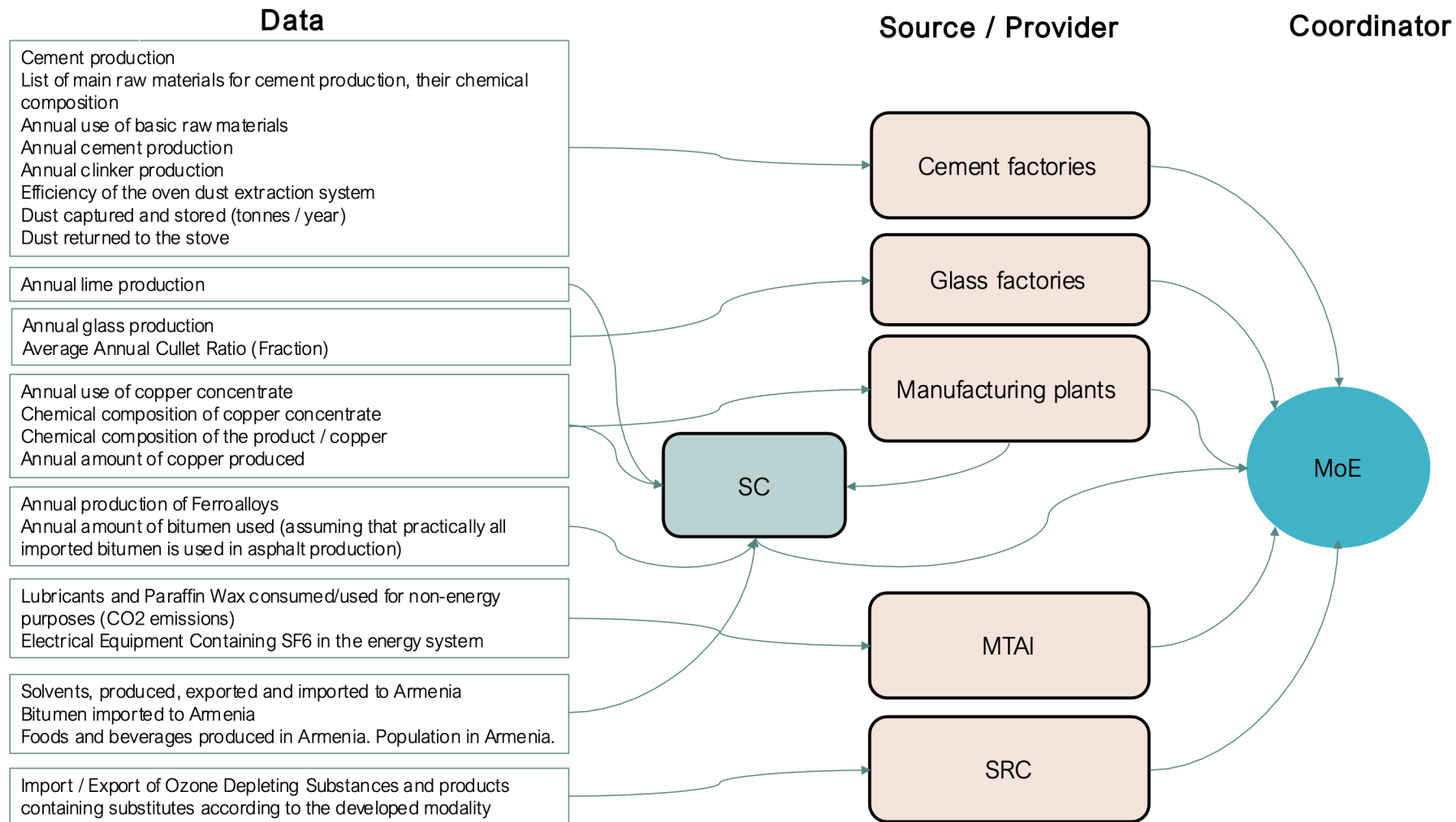
The MoE, as the inventory coordinator, carries out various tasks related to the compilation, management and safeguarding of information from different sources of information, which entail efforts for its treatment, validation and methodological application. However, these functions are not officially established in any regulation.

# Details per sector: energy

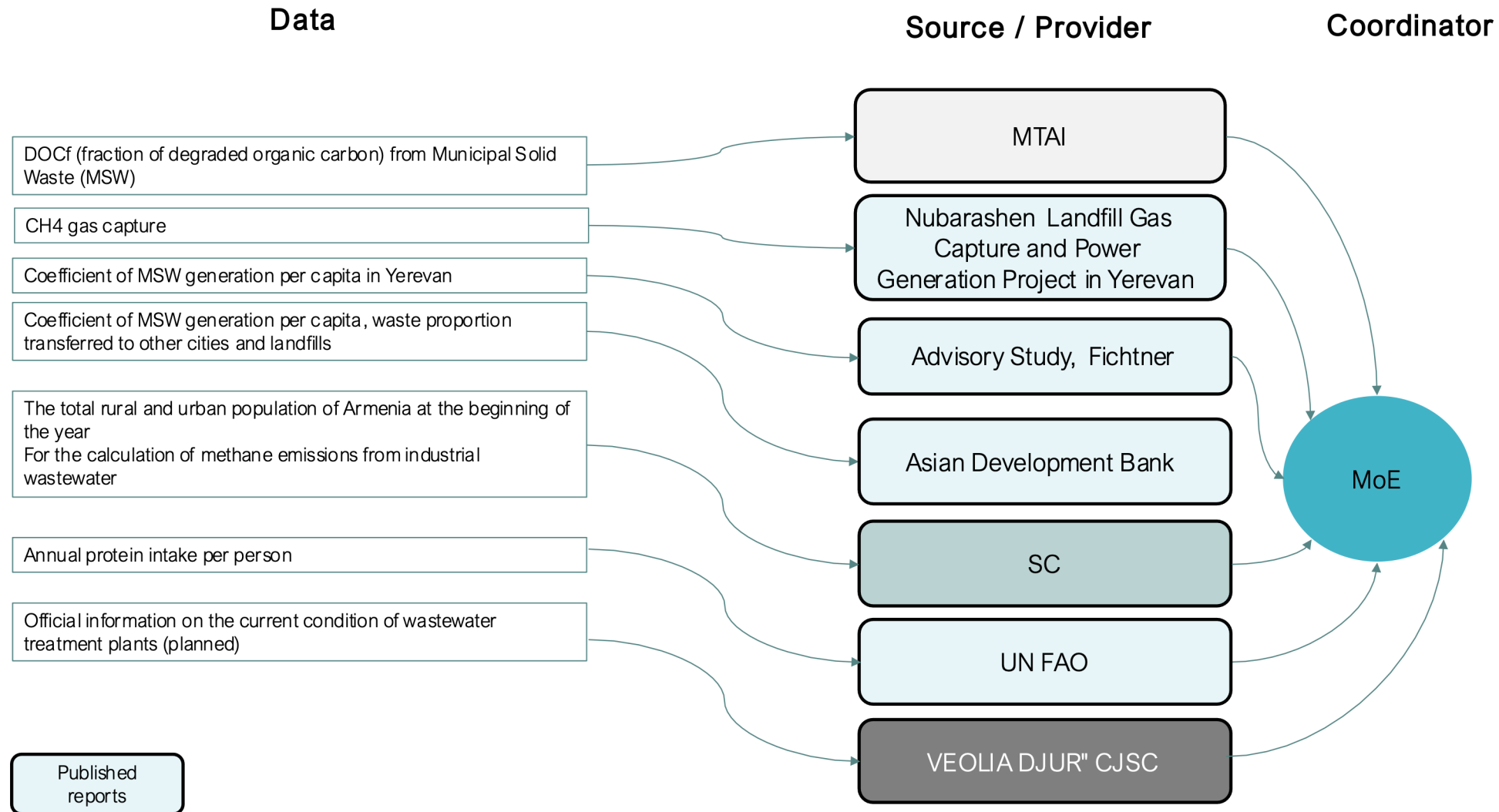


Source: Development of Background Information for Climate Change Monitoring, Reporting and Verification (MRV) Platform Design, Carbon Limits, 2022

# Details per sector: industrial processes and product use (IPPU)

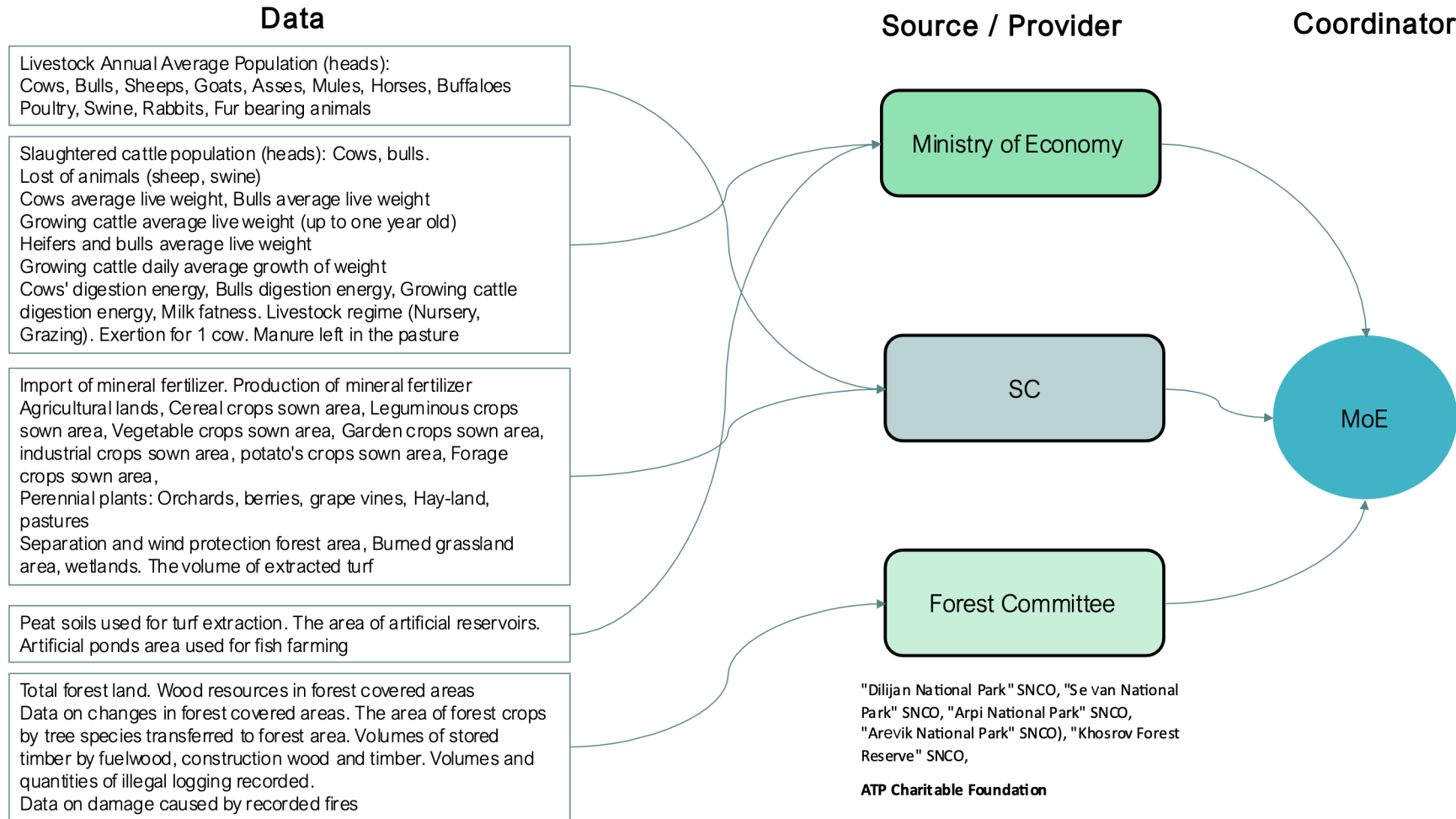


# Details per sector: waste



Source: Development of Background Information for Climate Change Monitoring, Reporting and Verification (MRV) Platform Design, Carbon Limits, 2022

# Details per sector: Agriculture, Forestry and Other Land Use (AFOLU)



Source: Development of Background Information for Climate Change Monitoring, Reporting and Verification (MRV) Platform Design, Carbon Limits, 2022

# Data Collection for GHG inventory in Armenia: 2017

The activities carried out for the integration of the last inventory (2017) are mentioned below (based on BUR3).

- Development of “Questionnaires” by sectors to clarify requirements for activity data.
- Close collaboration has been established between the GHG Inventory development expert team and the Statistics Committee (SC) to improve the accuracy/quality and consistency of data collected by SC within Household Survey.
- Improvement of the accuracy of activity data on emissions and removals
- Improvement of the completeness of the inventory
- Improvement of the quality control processes.
- National capacity building for GHG Inventory development.

# Recommendations identified

According to the analysis performed within the framework of this consultancy, 5 main recommendations are identified, within which other specific recommendations are included:

R1 - Establishment of a robust legal framework;

R2 - Establishment of a robust institutional structure for MRV system; R3 - Management of climate change policies in a centralized system;

R4 - Implementation of a verification system to verify emission reductions related to mitigation projects and GHG emissions of private sector;

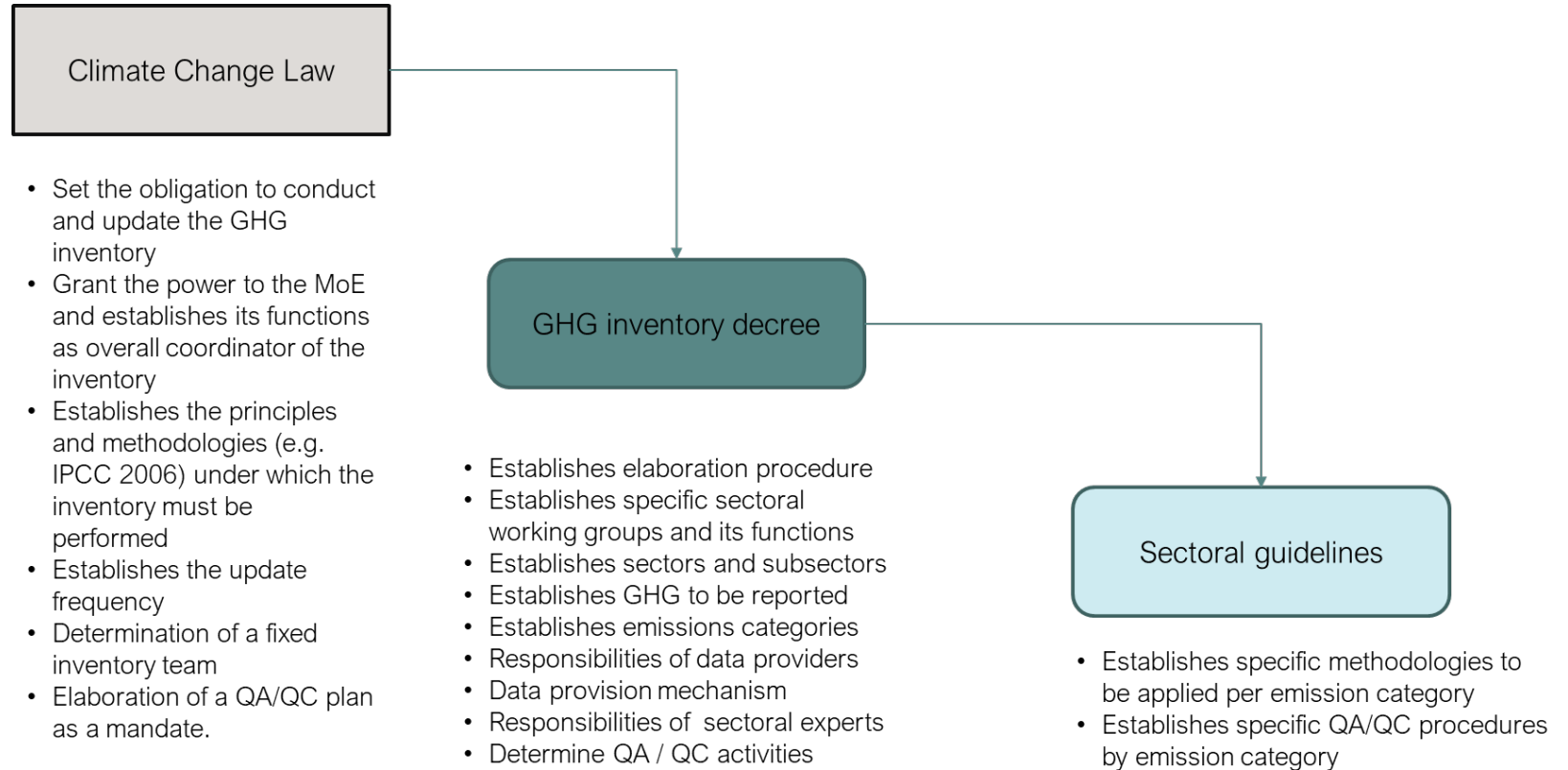
R5 - Data quality improvement.

# GHG Inventory: challenges & recommendations

R1.1 Development and implementation of a Climate Change Law

R1.3 Development of a specific regulation or guidelines for GHG inventory

GHG inventory is a complex task, it is considered compelling to regulate the activities that involve various data providers and validators of the information, to limit the scope and establish time periods that allow to conclude in a timely manner with the national inventories.



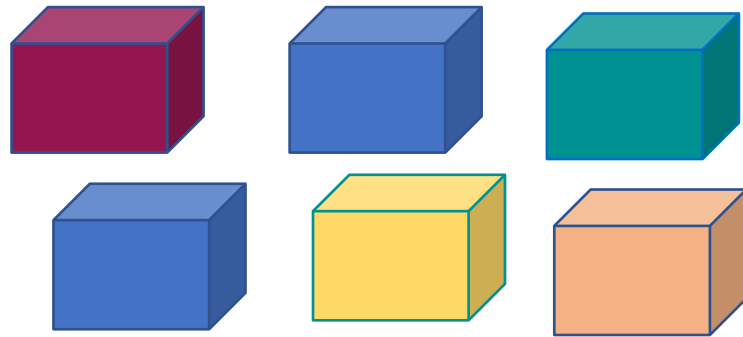


## R1.4 Sign inter-institutional cooperation agreements for data provision

- ✓ cooperation or inter-institutional agreements to streamline the processes of providing information to the MoE as overall coordinator of the system.
- ✓ MoE is recommended to promote inter-institutional agreements for collaboration in the generation, collection, reporting and management of the necessary information according to each system component, taking as a reference the functions that each instance has within the scope of its attributions.
- ✓ framework agreement (template) that allows sharing information under terms of confidentiality between institutions, emphasizing that the information used for inventory or other purposes related to climate policy, must be accompanied by the corresponding technical support that allows to validate the information.

# The future of MRV in the Armenian Context: the Climate Change MRV platform (CCMRV)

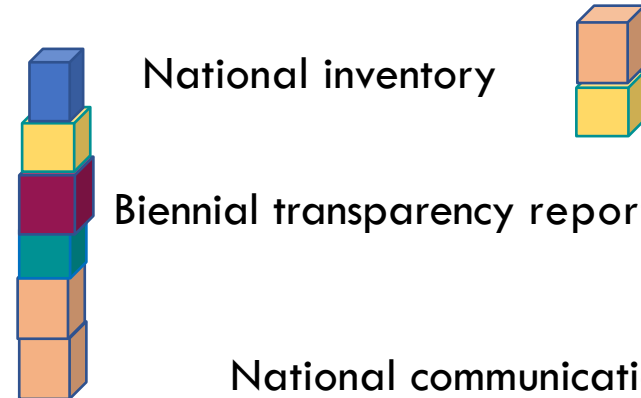
Good quality, reliable, comparable data



In a fluid form which can be aggregated to fulfil different reporting requirements



Nationally determined contributions



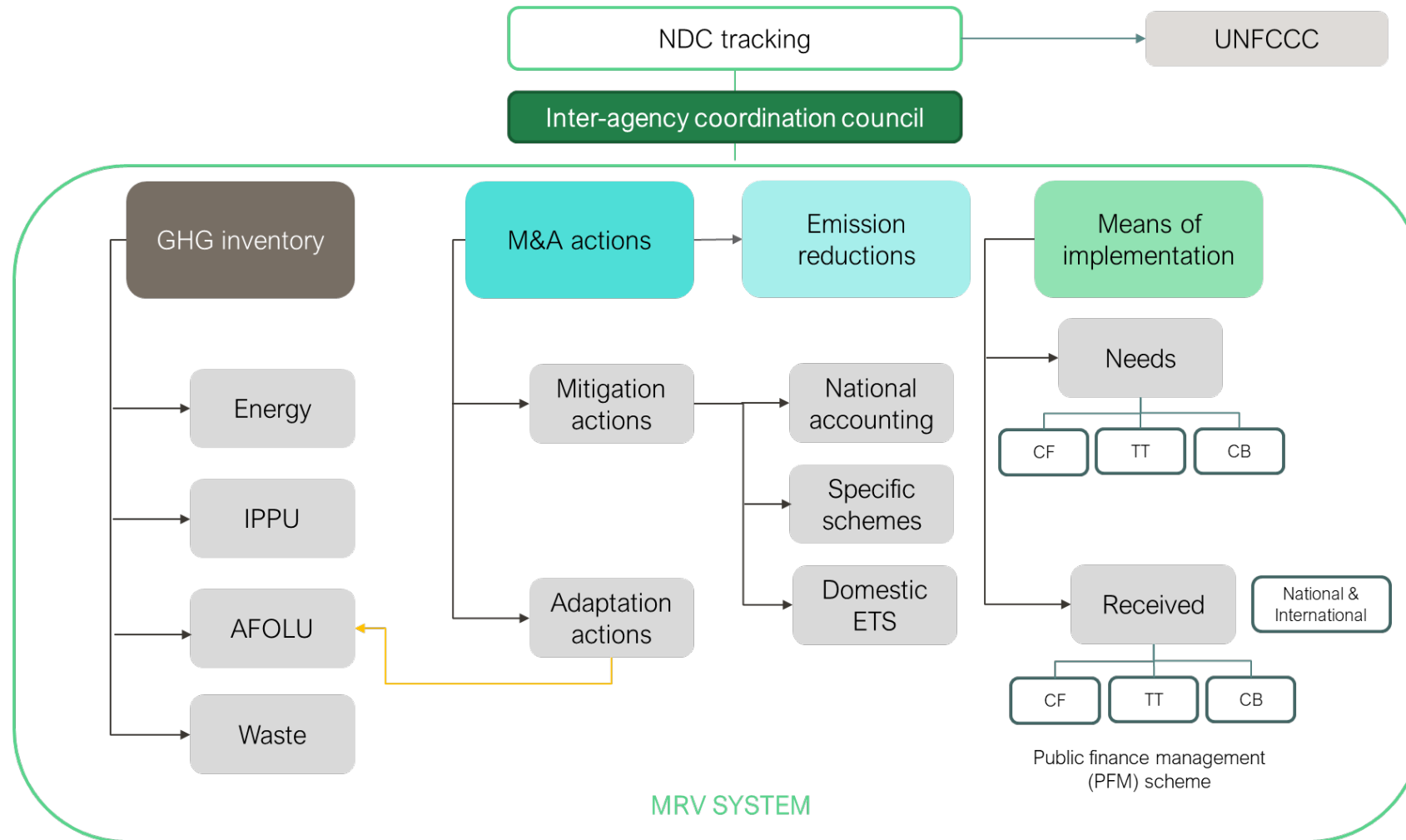
National inventory



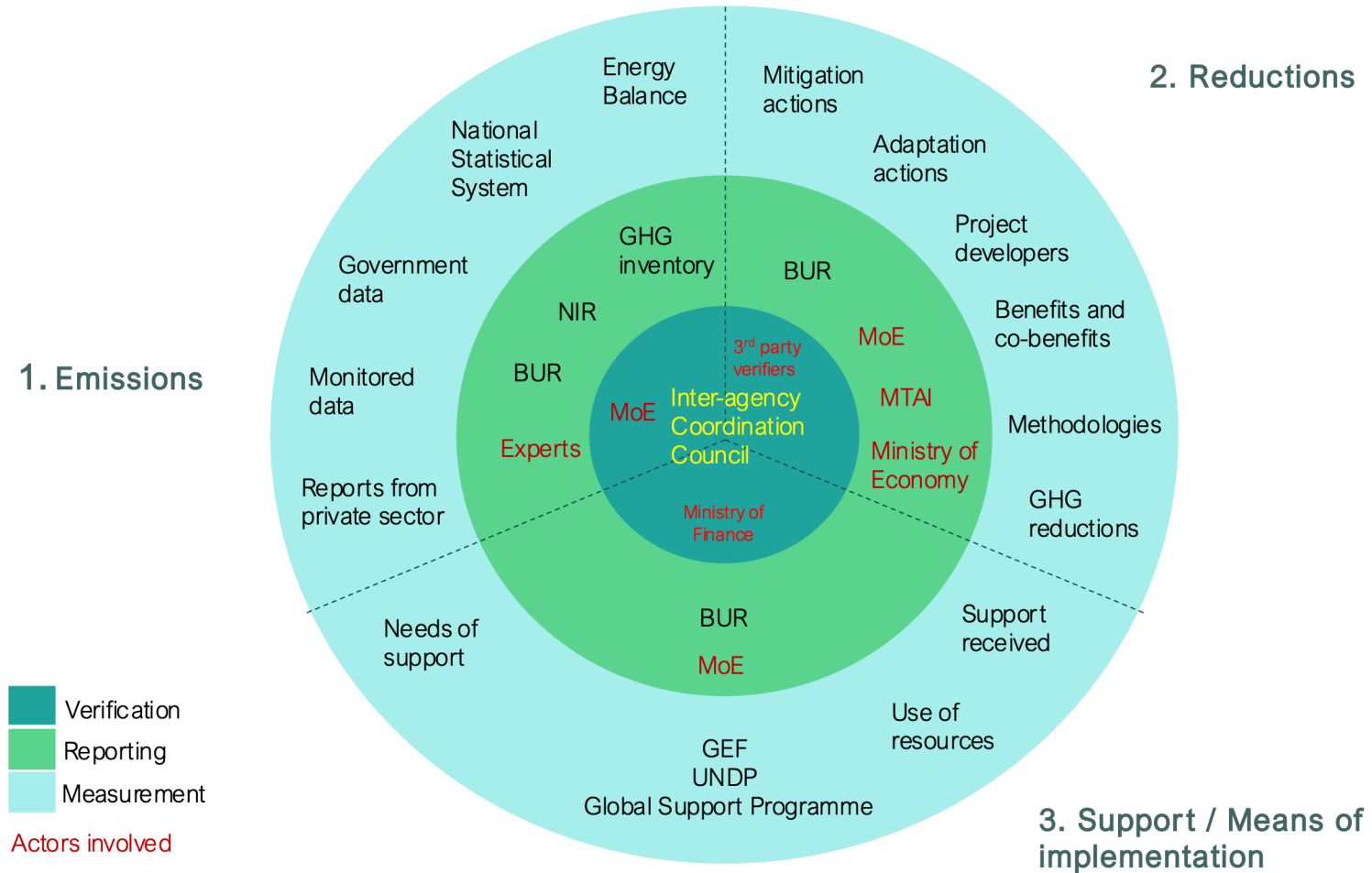
Biennial transparency report

National communications

# MRV components according to needs in Armenia



# MRV proposed structure



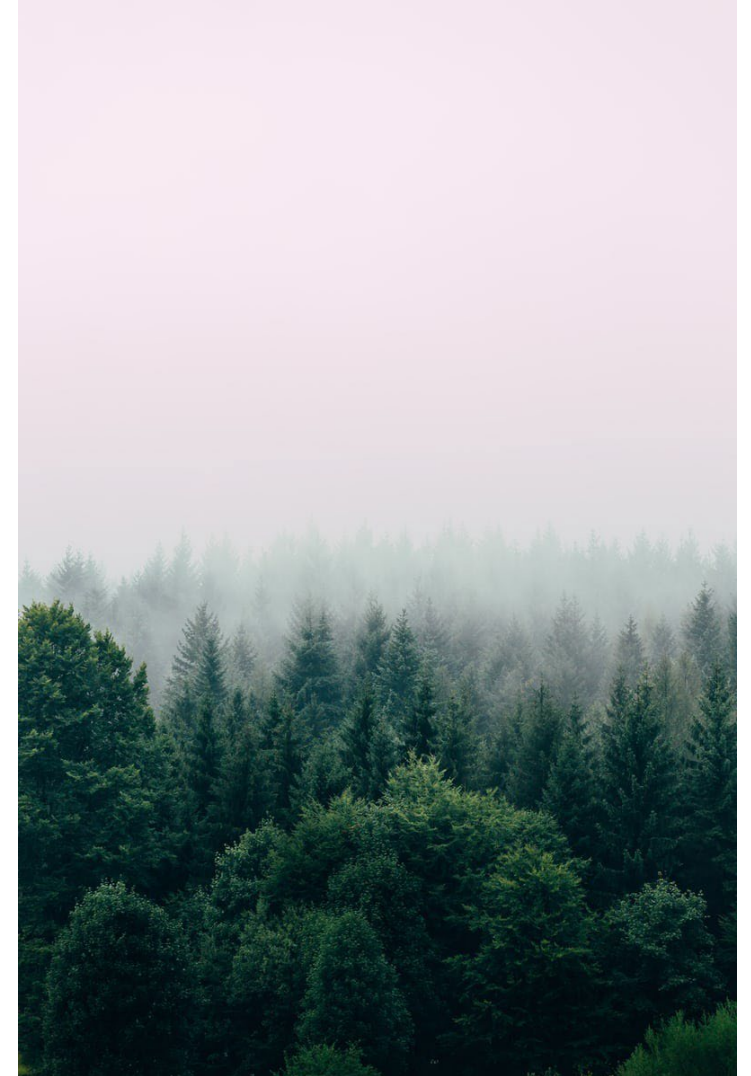
# Forest Sector GHG inventory gaps and problem

## Activity data and reporting

# LULUCF – Land Use and Land Use Change and Forestry

- LULUCF plays an important role in the Paris Agreement; Article 5 encourages Parties to conserve, and enhance, as appropriate, sinks and reservoirs of GHGs as referred to in Article 4, paragraph 1(d), of the Convention, including forests.
- Developed countries and many developing countries have experience in reporting and accounting for LULUCF activities through existing practices under the Convention and its Kyoto Protocol.
- For example, most developed countries are currently required to report specific activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol (afforestation, deforestation and forest management, and if elected, cropland management, grazing land management, revegetation and/or wetland drainage and rewetting) (UNFCCC, 2008). At the same time, under the Convention, some developing countries have elected to undertake REDD+ activities.

Source: <https://unfccc.int/sites/default/files/resource/ETFReferenceManual.pdf>



*The technical report of the Assessment of Land Use, Land Use Change and Forestry Sector Potential in Achieving Climate Change Mitigation Objectives in Armenia, issued on March 2021 under the EU4Climate UNDP-EU regional project, identifies opportunities to reduce GHG emissions and to enhance removals.*

It also provides recommendations for the development of long-term targets in the Land Use, Land Use Change and Forestry (LULUCF) sector in the context of the (2018/841) regulation in the EU, which requires accounted emissions from land use to be compensated by an equivalent removal of CO<sub>2</sub> from the atmosphere.

In order to evaluate potential mitigation actions, the national LULUCF inventory was replicated, with some features simplified, modified or corrected with the purpose of providing the most accurate estimation of existing emissions and removals for the analysis.

# LULUCF – Armenia NIR vs LULUCF study

**NIR**

**2017**

**-446 Gg CO<sub>2</sub> eq.**

**LULUCF study 2021**

**-184 Gg CO<sub>2</sub> eq.**

The report suggests that the capacity of Armenian forests to act as a sink are likely to be overestimated as a result of the assumptions chosen for land use matrix, wood removal and growth factor parameters.



# LULUCF – forest in the LULUCF

- Regarding forests, the report suggests that the growth value used in the inventory is low compared to international references, and the harvest volume used in the NIR estimations may be underestimated by nearly 20 times, since another recent source (GEF-UND, 2020) estimated the volume of commercial wood for 2016 to be nearly 33,900 m<sup>3</sup>, compared to 2,922 m<sup>3</sup> as indicated in the NIR for the year 2017, and 848,000 m<sup>3</sup> for energy wood, compared to 70,246 m<sup>3</sup> as indicated in the NIR for the year 2017.
- Updating the above parameters would significantly change the carbon balance of forests, and would allow the Government of Armenia to have a clearer picture of the current volume of wood harvested, the actual potential of the national forests to act as sinks, and the real potential for mitigation actions in the LULUCF sector, which is underestimated with the NIR figures when compared to the GEF-UND figures.
- It also notes that the land monitoring shows more deforestation than reported in the NIR, and flags the estimation of emissions from forest fires, which are not currently accounted for in the emission sources.

# LULUCF – agriculture in the LULUCF

- Regarding croplands, the report indicates that the calculation of perennial crops and stock variation of soils, for both croplands and grasslands, are likely to be mistaken in the NIR, and must be adjusted to be in line with IPCC guidelines. The report also indicates that changes between grasslands and crops affect large areas and that the land use matrix of the NIR needs to be adjusted to reflect more accurate conditions, which triggers important changes in the estimation of emissions & sinks.
- As for emission factors, the report notes that the IPCC default values for emissions from grasslands, croplands and soils with low activity clay under cool temperate dry climates are too low for country-specific conditions.
- Finally, regarding the stocks of carbon in soils, the report notes that the emission rate for litter is high for forests and zero for other land uses, although they do not differ much between the different land uses.

Break

We will resume in  
5 minutes

# Discussion on Gender aspects

# Gender and Climate Governance

“Gender inequalities are evident in formal institutional responses to climate change; women are underrepresented in governing agencies, and climate policy can negatively affect groups of women”  
(Pearse 2017, p.1)

“[W]omen’s representation in the politics and policies of climate change is crucial, not just as a matter of democracy and justice but as a source of change because, due to the gender power order, women as individuals and in groups have different experiences to men, and also different values which can become important in generating alternative climate change policies and strategies.”  
(Kronsell 2017, p.109)

Source: <https://www.ndcs.undp.org/content/dam/LECB/events/2020/20200303-ndc-gender-session5/undp-ndcsp-gender-webinar-MRV-Raul-Salas.pdf>

# Gender entry point for MRV arrangements

- MRV presents an opportunity to have a clearer picture of what is the role of climate actions and identify who is receiving the benefits of these actions and also know who is not
- MRV can enable a better understanding of gender-based roles and the impacts of climate actions, and thus, more effective climate actions
- MRV can empower women – beneficiaries of development and decision makers

(Huyer 2016)

# Question Time?

How would you strengthen the gender agenda in the MRV of emissions framework?

# Gender entry point for MRV arrangements

MRV of emissions and gender equality aspects:

1. Capacity-building within inventory teams on gender equality
2. Disaggregate GHG emissions by gender-based roles
  - Opportunity to shed light on the power relations and power structures
  - Enables an opportunity to understand entrenched patterns of social inequality in terms of race, class and gender (Cuomo 2011, Kronsell 2017)

Source: <https://www.ndcs.undp.org/content/dam/LECB/events/2020/20200303-ndc-gender-session5/undp-ndcsp-gender-webinar-MRV-Raul-Salas.pdf>



# Gender entry point for MRV arrangements

- Transition period to the ETF, this is the perfect moment to re-thing the existing MRV arrangements, and also see how can ambition in NDCs be raised by including gender equality aspects.
- Building capacities on gender equality within the MRV teams
- Develop a platform to make inequity and inequality visible and design more effective climate policies and measures
- Identify partnerships within national and sub-national institutions who have an interest in gender equality

Source: <https://www.ndcs.undp.org/content/dam/LECB/events/2020/20200303-ndc-gender-session5/undp-ndcsp-gender-webinar-MRV-Raul-Salas.pdf>

## Section 5

Q&A and Closing

# References

Reference Manual for the Enhanced Transparency Framework under the Paris Agreement	2020	<a href="https://unfccc.int/sites/default/files/resource/ETReferenceManual.pdf">https://unfccc.int/sites/default/files/resource/ETReferenceManual.pdf</a>
Paris Agreement		
Gender entry point for MRV	2015	<a href="https://unfccc.int/sites/default/files/english_paris_agreement.pdf">https://unfccc.int/sites/default/files/english_paris_agreement.pdf</a>
	2020	<a href="https://www.ndcs.undp.org/content/dam/LECB/events/2020/20200303-ndc-gender-session5/undp-ndcsp-gender-webinar-MRV-Raul-Salas.pdf">https://www.ndcs.undp.org/content/dam/LECB/events/2020/20200303-ndc-gender-session5/undp-ndcsp-gender-webinar-MRV-Raul-Salas.pdf</a>

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Kronsell, Annica. 2017. "The contribution of feminist perspectives to climate governance." In *Understanding Climate Change through Gender Relations*, 104-120. Routledge.

# References

BUR 1	2014	<a href="https://www.thegef.org/projects-operations/projects/5641">https://www.thegef.org/projects-operations/projects/5641</a>
BUR 2	2018	<a href="http://nature-ic.am/en/publication/Armenia%E2%80%99s-Second-Biennial-Update-Report/10553">http://nature-ic.am/en/publication/Armenia%E2%80%99s-Second-Biennial-Update-Report/10553</a>
GHG Inventory Report	2020	<a href="https://drive.google.com/file/d/1q6Jz3YT9vLKFEq1A7yTbGN2FccFNsqw1/view?usp=sharing">https://drive.google.com/file/d/1q6Jz3YT9vLKFEq1A7yTbGN2FccFNsqw1/view?usp=sharing</a>
4th National 2020 Communication	2020	<a href="http://www.nature-ic.am/Content/announcements/11676/FNC_Eng.pdf">http://www.nature-ic.am/Content/announcements/11676/FNC_Eng.pdf</a>
SDG Voluntary Review	2020	<a href="https://www.mfa.am/en/press-releases/2020/06/17/arm_dev/10310">https://www.mfa.am/en/press-releases/2020/06/17/arm_dev/10310</a>
NAP	2021	<a href="https://unfccc.int/sites/default/files/resource/NAP_Armenia.pdf">https://unfccc.int/sites/default/files/resource/NAP_Armenia.pdf</a>
BUR 3	2021	<a href="https://unfccc.int/documents/274257">https://unfccc.int/documents/274257</a>
Reporting Guidelines	2022	<a href="https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/reporting-requirements">https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/reporting-requirements</a>

**A full list of references and further reading will form part of the final report on the trainings.**