Mitigation and Climate Change Reports Division

Presentation for Department of Climate Change
In-house Training
Friday 12th March 2021

Contents

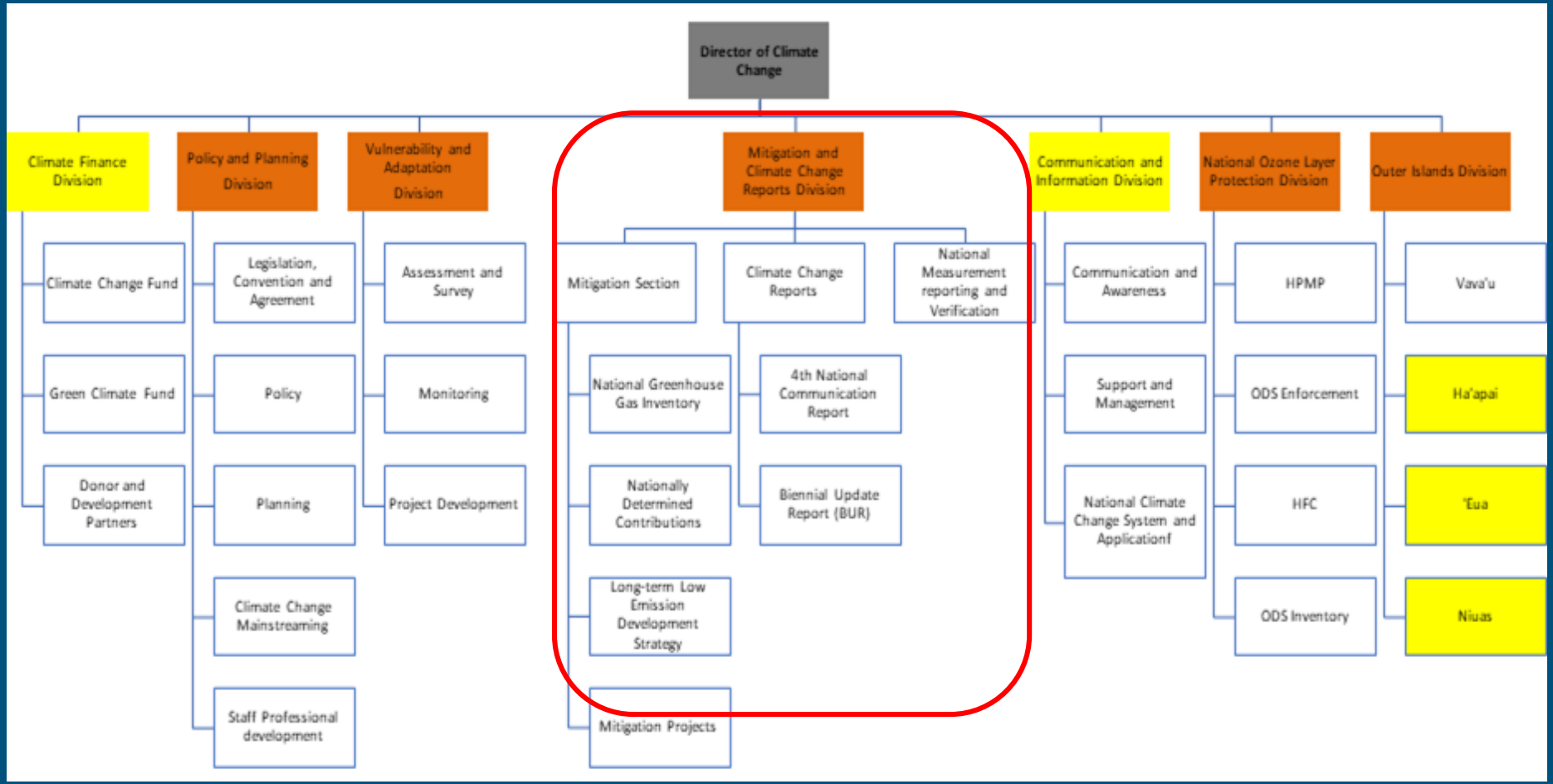
- Background Information about Division
- Sub-Output 1: National Greenhouse Gas Inventory
  - Greenhouse gases
  - Sources of emissions, removals and sinks
  - Sectors – Energy, AFOLU, IPPU and Waste
  - Greenhouse gas inventory – cycle, process, reports

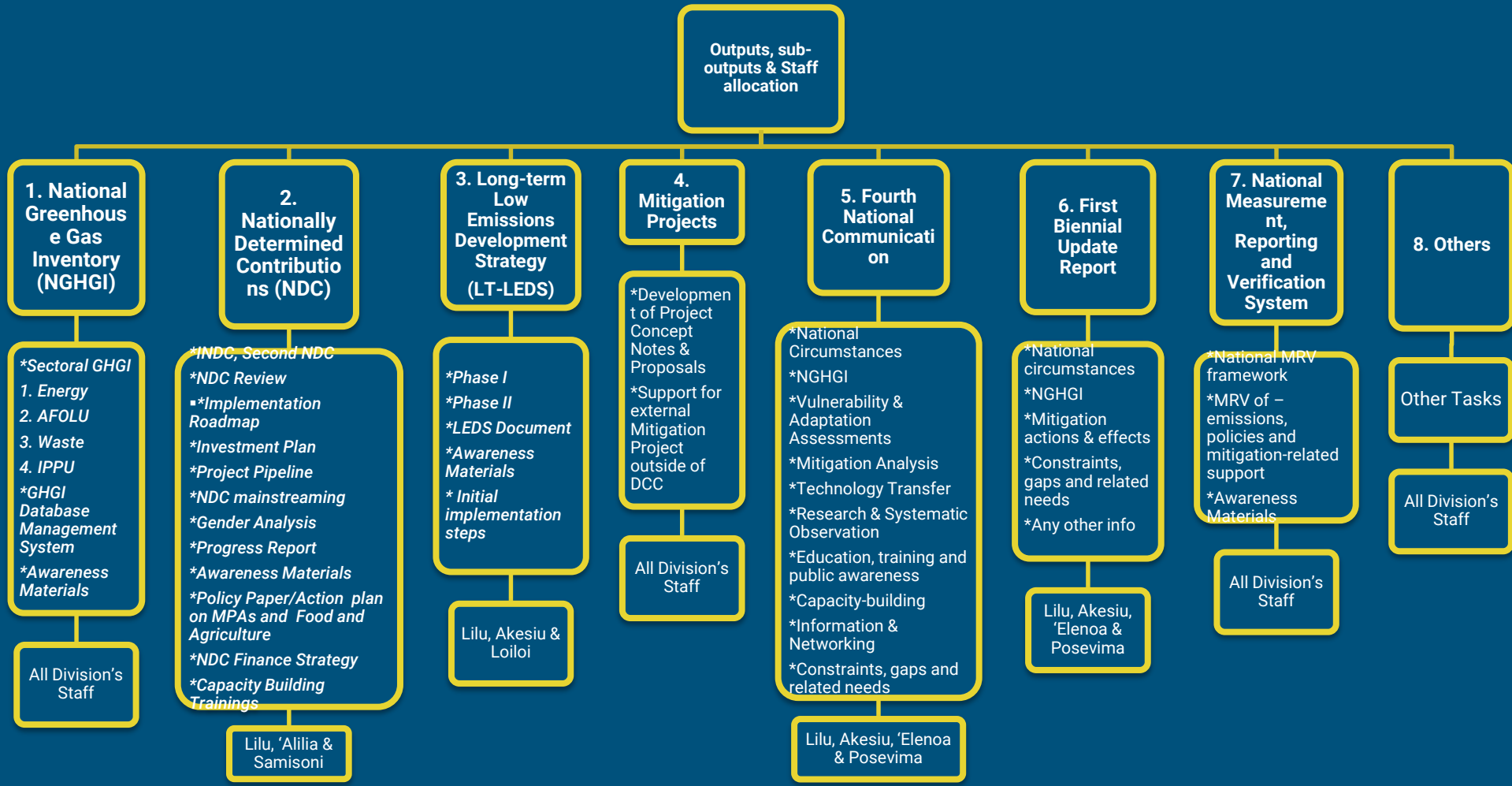
Q & A

Division’s functions:

- Prepare Tonga’s climate change reporting obligations to the United Nations Framework Convention on Climate Change (UNFCCC) and Paris Agreement.
- Implement mitigation projects and activities.
- Provide support for any existing mitigation projects and activities
- Conduct any other task as directed by Director and CEO.

Organizational Structure (CP 2020-21)




Outputs, sub-outputs & Staff allocation
1. National Greenhouse Gas Inventory (NGHGI)
*Sectoral GHGI
1. Energy
2. AFOLU
3. Waste
4. IPPU
*GHGI Database Management System
*Awareness Materials
All Division's Staff
2. Nationally Determined Contributions (NDC)
*INDC, Second NDC
*NDC Review
▪*Implementation Roadmap
*Investment Plan
*Project Pipeline
*NDC mainstreaming
*Gender Analysis
*Progress Report
*Awareness Materials
*Policy Paper/Action plan on MPAs and Food and Agriculture
*NDC Finance Strategy
*Capacity Building Trainings
Lilu, 'Alilia & Samisoni
3. Long-term Low Emissions Development Strategy (LT-LEDS)
*Phase I
*Phase II
*LEDS Document
*Awareness Materials
* Initial implementation steps
Lilu, Akesiu & Loiloi
4. Mitigation Projects
*Development of Project Concept Notes & Proposals
*Support for external Mitigation Project outside of DCC
All Division's Staff
5. Fourth National Communication
*National Circumstances
*NGHGI
*Vulnerability & Adaptation Assessments
*Mitigation Analysis
*Technology Transfer
*Research & Systematic Observation
*Education, training and public awareness
*Capacity-building
*Information & Networking
*Constraints, gaps and related needs
Lilu, Akesiu, 'Elenoa & Posevima
6. First Biennial Update Report
*National circumstances
*NGHGI
*Mitigation actions & effects
*Constraints, gaps and related needs
*Any other info
Lilu, Akesiu, 'Elenoa & Posevima
7. National Measurement, Reporting and Verification System
*National MRV framework
*MRV of – emissions, policies and mitigation-related support
*Awareness Materials
All Division's Staff
8. Others
Other Tasks
All Division's Staff

National Greenhouse Gas Inventory

Sub-Output 4.1

What are Greenhouse Gases?

Greenhouse gas, any gas that has the property of absorbing infrared radiation (net heat energy) emitted from Earth's surface and reradiating it back to Earth's surface, thus contributing to the **greenhouse effect**.

Gases	Chemical Formula	Gases	Chemical Formula
Carbon dioxide	CO_2	Hydroflurocarbon	HFCs
Methane	CH_4	Perflurinated Compounds	PFCs
Nitrous oxide	N_2O	Sulfur hexafluoride	SF_6
Carbon Monoxide	CO	Chlorofluorocarbon	CFCs
Non-methane volatile organic compounds	NMVOC	Nitrogen trifluoride	NF_3
Sulfur dioxide	SO_2	Nitrogen oxide	NOx

Sources of Emissions & Sink

Gases	Human Source (Examples)
Carbon dioxide (CO_2)	Fossil fuel combustion, land use changes, cement production…
Methane (CH_4)	Fossil fuel mining/distribution, livestock, rice agriculture, landfills
Nitrous oxide (N_2O)	Agriculture (fertilisers) and associated land use change
Hydrofluorocarbons (HFCs)	Liquid coolants
Perfluorocarbons (PFCs)	Refrigerant, electronics industry and aluminum industry,
Nitrogen Trifluoride (NF_3)	Electronics and photovoltaic industries

Sectors

The 2006 IPCC Guidelines estimates of anthropogenic GHG emission and removal are divided into the following sectors;

ENERGY:

Emissions of all GHGs resulting from stationary and mobile energy activities include fuel combustion and fugitive fuel emissions

AGRICULTURE FORESTRY AND OTHER LAND USE (AFOLU):

Anthropogenic emissions from agriculture activities except fuel combustion, which is addressed under Energy, emissions and removals of CO_2, CH4, and N_2O from forest management, other land-use activities, and land-use change.

INDUSTRIAL PROCESSES AND PRODUCT USE (IPPU):

By-product or fugitive emissions of GHG from industrial processes not directly related to energy activities such as fossil fuel combustion, and emissions, of primarily NMVOCs, resulting from the use of solvents and N_2O from product uses

WASTE:

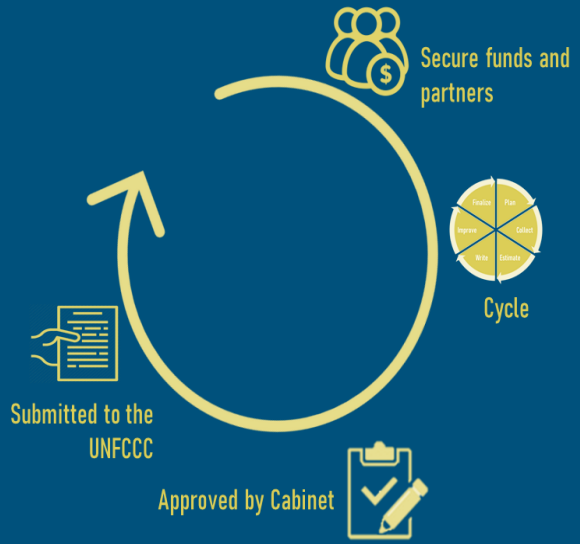
Emissions from waste management activities

What are National Greenhouse Gas Inventory

A GHG inventory is an estimation of all emissions (and removals) of particular gases from given sources from a defined region in a specific period of time.

CYCLE:

Process :



Reports :

- National Communication Report {1st, 2nd, 3rd, 4th}
- Nationally Determined Contributions {1st, 2nd}
- Long Term Low Emission Strategy
- Biennial Updated Report

Greenhouse Gas Inventory Calculation & Tools

Calculation

$$E = EF \bullet AD$$

Where:
E = Emission
EF = Emission Factor
AD = Activity Data

Software

The following are tools used to built on the 2006 IPCC Guidelines.

1. IPCC Emission Factor Database (EFDB): IPCC is a web tool that catalogues in a searchable format for all emission and other factors from the IPCC Guidelines. The EFDB provides a platform where GHG inventory compilers can exchange information and data to estimate GHG emissions and removals from any activity.
2. IPCC GHG inventory software: Is a tool that can be used for the estimation of GHG emissions/removals an entire inventory or individual categories.

Guidelines

2006 IPCC Guidelines provide a technically sound methodological basis of national greenhouse gas inventories; however, to maintain their scientific validity, certain refinements may be required, taking into account scientific and other technical advances that have matured sufficiently since 2006.

Thank You