INITIATIVE FOR CLIMATE ACTION TRANSPARENCY PROJECT

PHASE II

Greenhouse Gas (GHG) Emissions Inventory Capacity Building in Fluorinated Gases (F-Gases)

Workshop Report

FIJI

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DISCLAIMER

PREPARED UNDER

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1.0 Introduction

The Greenhouse Gas (GHG) Emissions Inventory Capacity Building in Fluorinated Gases (F-Gases) was organized by Climate Change Division of the Ministry of Environemt and Climate Change formerly at the Office of Prime Minister in collaboration with the Greenhouse Gas Management Institute (GHGMI). The workshop was conducted on 20th – 21st February, 2024 at DoubleTree Resort by Hilton Fiji Resort on Sonaisali Island, Nadi.

The Hydrofluorocarbons (HFCs) emissions from the refrigeration and air conditioning sub-sector of the Industrial Product and Product Use (IPPU) sector is a key source category in Fiji. However a national system of monitoring of HFC emissions from Refrigeration and Air-Conditioning (RAC) sub-sector is not established, although the refrigerants have been widely used in the country. Emissions of fluorinated gases have not been reported in the national GHG inventory such as in Third National Communication (TNC), but this is a mandatory category under the Paris Agreement and the Enhanced Transparency Framework (ETF) for all countries. Fiji has ratified Kigali Amendment to the Montreal Protocol that targets phasing out of HFCs by 2045 and therefore has to be consistent with the GHG Inventory data. Hence the objective of the workshop were as follows:

(i) To provide training to national experts in estimating HFC emissions for the GHG inventory for RAC category using appropriate Intergovernemntal Panel on Climate Change (IPCC) methodologies.
(ii) Identifying the national sources for HFC emission data and mapping the national data flow.
(iii) To provide training on creating a baseline emission and phase-out curve for HFCs for Kigali Amendment to the Montreal Protocol.

The workshop consisted of presentations, delivered by GHGMI personnel, Dr. Olia Glade and Ms. Alissa Benchimol, on Tier 1 and Tier 2 methodologies, data requirements, national data flow and Kigali amendment and requirements. There were practical exercises, break-out sessions for group activities on using tools and templates for GHG inventory for HFC emissions and creating a data flow map for tracking the national HFC data. The presentations and activities for the workshop will be discussed in the next Section 2.0 and the agenda for this workshop can be found in **Annex 1**.

A total of 10 participants attended the workshop, of which 2 were from Ozone Depleting Substances Unit within Department of Enviroment and 2 were from CCD, 1 national expert from the University of the South Pacific, 2 from Fiji Revenue and Customs Authority, 2 from Department of Energy and 1 from Fiji Bureau of Statistics. A detailed participant list is provided in **Annex 2**. Upon further analysis of the participants list, there were 40% female participants and 60% male participants. It was a small group of participants who were working or were interested in developing the Monitoring Reporting and Verification (MRV) system for HFC emissions in Fiji from the RAC sub-sector.

2.0 Workshop Presentations

The presentations for the workshop was divided into three broad areas encapsulating the objective of the workshop. The presentations made during the workshop provided the participants with the overview of Tier 1 and Tier 2 methodologies for HFC emissions from RAC sector, data requirements, data flow mapping and reporting F-gases under Kigali amendment. All presentations were very interactive and also participants had hands-on experience with IPCC tools and software for estimating HFC emissions. The workshop commenced with an introduction and welcome remarks by Ms. Ranjila Singh, Mitigation Specialist, Climate Change Division followed by general remarks from Dr. Olia Glade. Participants introduced themselves followed by a group photo (attached in **Annex 3**).

2.1 Day 1 Presentations

Day 1 of the workshop began with an overview of presentations and exercises for the day by Ms. Alissa Benchimol followed by first presentation on key concepts on data requirements and sourcing for domestic refrigeration and air conditioning was delivered by Dr. Olia Glade. The presentation introduced the 2F1 category of IPPU sector, 6 sub-applications within the RAC category and different HFCs used in different applications. The concept of "bank" emissions was thoroughly explained which led to the key elements in estimating HFC emissions as highlighted in **Figure 1** below:

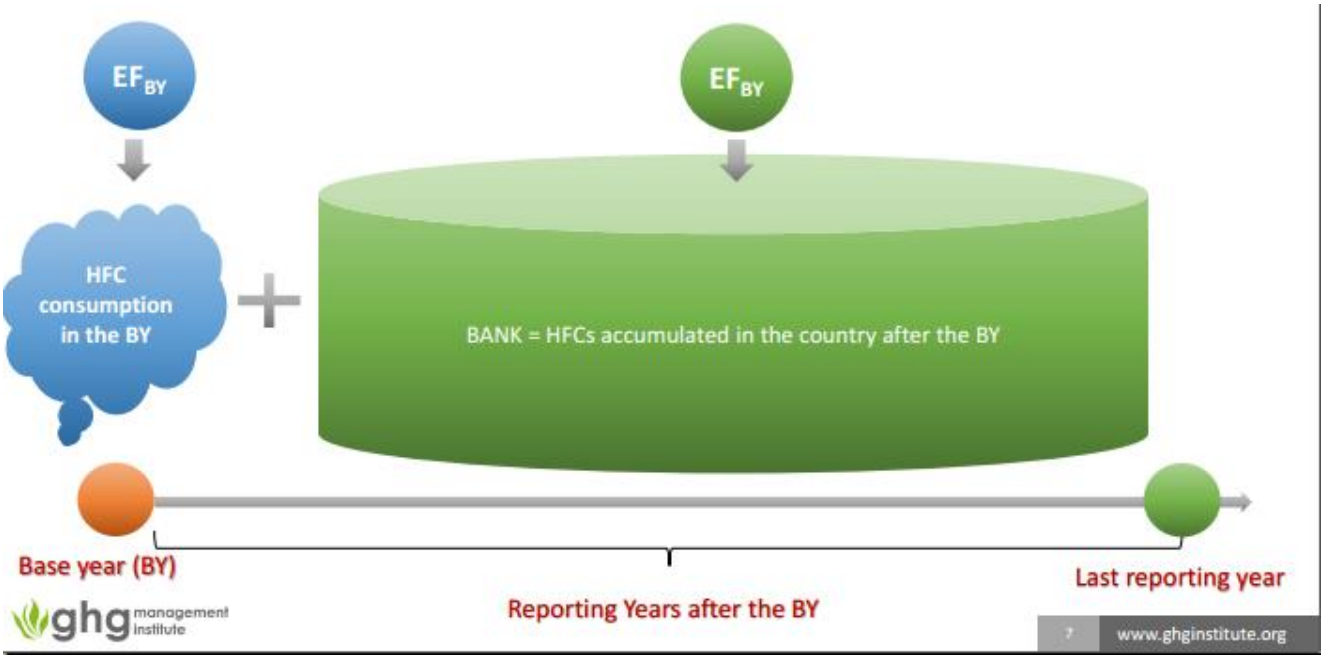

***Figure 1**: Keys elements in estimating HFC emissions from base year to the reporting year (Source: GHGMI).*

The presentation then further introduced the Tier 1 methodology or different approaches used for calculating HFC emissions as shown in **Figure 2** below and it concluded with data requirements for the different approaches.

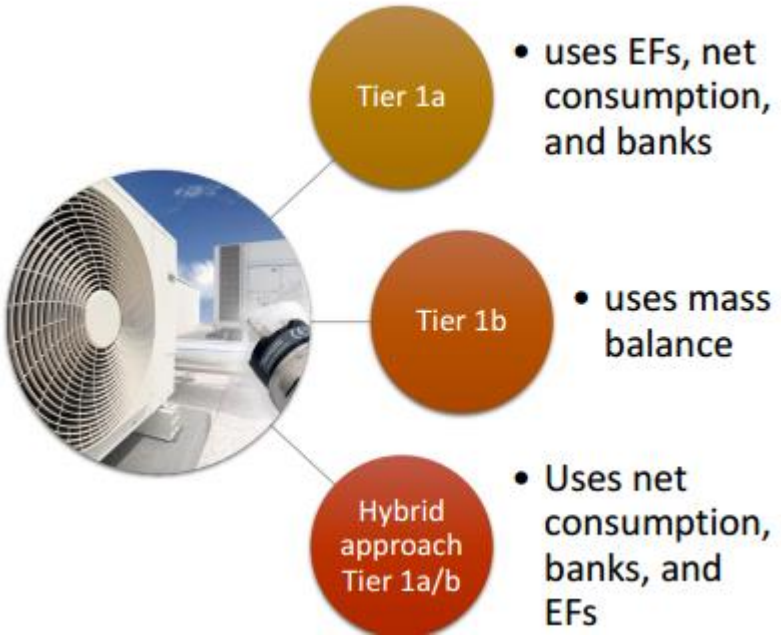

***Figure 2**: Different approaches in Tier 1 methodology for estimating HFC emissions (Source: GHGMI).*

At the end of the first session, participants did practical exercises on understanding and reading blend compositions and then calculating individual amount of HFCs in blends. The second session on step-by-step estimation of HFC and PFC emissions using IPCC Templates (Tier 1) was delivered by Ms. Alissa Benchimol. This presentation discussed mostly on the Tier 1a/b hybrid approach and the data requirements and assumptions used in the IPCC templates. The session was very interactive whereby each participant had the IPCC excel sheet developed for the 2F1 category on their laptops and went through a step by step process in estimating HFC emissions using national dataset.

Session 3 of Day 1 was on Tier 2 methodology and was delivered by Ms. Alissa Benchimol. The presentation highlighted two approaches: Tier 2a (emission factor) and Tier 2b (mass balance) and explained the data requirements for Tier 2 methodology. The presentation also showed a worked example for mass balance calculations. The last presentation of the day was on mapping existing data sources and data flows and was delivered by Dr. Olia Glade. The presentation highlighted a graphical flow of data which is necessary to trace the data along the inventory cycle and takes into account activity data collection, relevant responsibilities of designated authorities for approvals and sign-offs and QA/QC procedures. A step by step example of data flow diagram for lime production was also discussed.

Later in the afternoon, a group breakout session looked at the data flow mapping for HFC emissions from the RAC category in Fiji and then the results of the discussion was presented by Dr. Francis Mani and Mr. Abhinesh Jattan on behalf of the participants. This was followed by general discussions, Q&A session that were facilitated by Dr. Olia Glade and that concluded the sessions for Day 1.

2.2 Day 2 Presentations

Day 2 of the workshop began with a re-cap of Day 1 sessions and this was facilitated by Dr. Olia Glade. Day 2 was more focused on Kigali agreement reporting for fluorinated gases. The first presentation was on "Using F-gases data for reporting for the Kigali Agreement under the Montreal Protocol" delivered by Dr. Olia Glade and Alissa Benchimol. It was highlighted that Fiji is in Group 1 of Article 5 countries HFC phasedown plan with 80% reduction by 2045. **Table 1** shows the baseline calculations and the reduction steps discussed in the session.

Table 1: Baseline calculations and the reduction steps

	Article 5 Parties: Group 1	
Baseline Years	2020, 2021 & 2022	
Baseline Calculation	Average production/ consumption of HFCs in 2020, 2021, and 2022 Plus 65% of HCFC baseline production/ consumption	
Reduction Steps Freeze	2024	
Step 1	2029	10%
Step 2	2035	30%
Step 3	2040	50%
Step 4	2045	80%

During these sessions participants learnt how to calculate the GWP of blends as Tonnes of CO_2 equivalent (t CO_2e), which is a common metric used by the Montreal Protocol for reporting. There were further presentations on data requirements and how to derive a complete time series to enable baseline calculations and then calculate the specified reduction targets as given in **Table 1** above. Participants used the excel sheet to calculate the baseline and did a step down reduction for Fiji until 2045 and found this to be a worthwhile experience.

At the end of the second day of the workshop, participants worked with tools like the IPCC Inventory software and Sectorial Activity Data for GHG Emissions (SAGE) tool to familiarize themselves and how these tools could be incorporated into developing a national MRV system for F-gases.

3.0 Key Outcomes

The following are key outcomes arising from Greenhouse Gas (GHG) Emissions Inventory Capacity Building in Fluorinated Gases (F-Gases) technical workshop:

1. Participants attained a comprehensive understanding of different approaches in Tier 1 and Tier 2 methodology for estimating HFC emissions and data requirements for each methodology. The practical exercise on the use of hybrid 1 a/b spreadsheet further enhanced the learning.
2. Data requirements and calculations for Tier 2 methodology is made clear to the participants. Discussions with relevant stakeholders showed that it may be possible to adopt Tier 2 methodology for Fiji as the quantity of F-gases in imported equipment are recorded. However, it was noted that data is not disaggregated by sub-application and not digitized and some improvements in recording activity data for Tier 2 was discussed.
3. Data flow and mapping process was explained and the participants did a data flow mapping in the breakout sessions and there were discussions on the processes and the responsibilities of the designated authorities in the QA/QC process as well.
4. Kigali agreement and the reduction target for Group 1 Article 5 country was emphasized in the presentations and participants now understand the mechanistic detail of baseline calculations, which is the starting point.
5. Data requirements and calculating GWP of blends were highlighted to express the HFC consumption in Tonnes of CO_2 equivalent.
6. Familiarisation of IPCC Inventory software and SAGE tool was undertaken so that it could be utulised in the development of national MRV system for F-gases.

4.0 Conclusion

The two-day workshop ended on a positive note and participants were enriched with developing a national inventory for HFCs and for Kigali reporting and reduction target verifications. Dr. Olia Glade thanked all the presenters and organisers for the excellent delivery of the workshop as well the participants for their enthusiasm and active participation. The workshop then closed with a brief closing remarks by Ms. Ranjila Singh.

Annex 1: Workshop Agenda

Initiative for Climate Action Transparency (ICAT) Phase II Project Technical Workshop

Greenhouse Gas (GHG) Emissions Inventory Capacity Building in Fluorinated Gases (F-Gases)

Nadi, Fiji

Date: 20-21 February, 2024
Time: Start Time 9:00 Local Time
Location: DoubleTree Resort by Hilton Fiji Resort on Sonaisali Island

Training Agenda

Tuesday, 20 February 2024

Day 1: Industrial Process and Product Use: Fluorinated Gases Emissions on Air Conditioning and Refrigeration

	Welcome & Introductions	**Ranjila Singh**
15 min	**Day 1 Overview**	**Alissa Benchimol, GHGMI**
1 h	**Session 1:** Key concepts and data requirements	**Dr. Olia Glade, Alissa Benchimol, GHGMI**
30 min	**Tea break**	

1 h	**Session 2:** Step-by-Step Estimation of HFC and PFC Emissions using IPCC Templates (Tier 1)	**Alissa Benchimol, GHGMI**
45 min	**Session 3:** Presentation on data requirements to shift to Tier 2	**Alissa Benchimol, GHGMI**
	Lunch Break	
30 min	**Session 4:** Presentation on mapping existing data sources and data flows	**Dr. Olia Glade, GHGMI**
1 h	**Session 4a:** Practical exercise with data flow and mapping	**Dr. Olia Glade, Alissa Benchimol, GHGMI**
30 min	**Tea break**	
1 h	**Plenary Session**	**Dr. Olia Glade, Alissa Benchimol, GHGMI**
15 min	**Closing and recap**	

Training Agenda

Wednesday, 21 February 2024

Day 2: Kigali Agreement Reporting on Fluorinated Gases

30 min	**Day 1 Recap and Q&A**	**Dr. Olia Glade, Alissa Benchimol, GHGMI**
45 min	**Session 1:** Using F-gases data for reporting for the Kigali Agreement under the Montreal Protocol	**Dr. Olia Glade, GHGMI**
30 min	**Tea break**	
1.5 h	**Session 2:** Building baseline and phase-out curve for HFC for Kigali Agreement	**Dr. Olia Glade, Alissa Benchimol, GHGMI**
1 h	**Lunch Break**	
1.5h	**Session 3:** Discussion on data sources, mapping, and tools for Kigali Agreement reporting	**Dr. Olia Glade, Alissa Benchimol, GHGMI**
30 min	**Tea break**	
1.5 h	**Session 4:** Improvements and responsibilities for Kigali Agreement	**Dr. Olia Glade, Alissa Benchimol, GHGMI**
30 min	Closing and Group Photo	**Alissa Benchimol, GHGMI**

Annex 2: ICAT F-gases Workshop participants

Participants List for F-gases workshop held on 20th- 21st February, 2024 at Double tree hotel, Nadi.

Name	Department	Role	
Cristine Saxena	FRCS	Economic Planning Officer	
Avinesh Swammy	FRCS	Intelligence Analyst	
Francis Mani	USP	Senior Lecturer	
Asish Chand	FBOS	Statiscian	
Abhinesh Jattan	Dept. of Env.	Technical Officer	
Deepitika Chand	CCD	Senior Climate Change Mitigation Officer	
Ranjila Singh	CCD	Mitigation Specialist	
Pranesh Chand	Dept. of Energy	Technical Officer	
Mary Takaue	Dept. of Env.	Project Officer	
Setareki Tuilovoni	Dept. of Energy	Technical Officer	

Annex 3: Group Photo