Achieving Multiple Benefits and Quick Results through National Lifecycle Refrigerant Management Plans

4 November 2025; 13h-15h

Conference Room 11, United Nations Office at Nairobi, Kenya

CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS
a UNEP convened initiative

IGSD

Vienna Convention
MONTREAL PROTOCOL

Agenda

- Welcome: Mr. Jimmy Rakotovao, Programme Manager, CCAC Secretariat
- Opening Remarks: Mr. Makoto Kato, CCAC Cooling Hub Co-Chair, Japan
- Presentation of the Practical Guide: Ms. Cecilia Mercado, Consultant, IGSD
- Experiences and Country Case Studies:
  - Development of Digital Tracking System in Vietnam, Ms. NGUYEN Dang Thu Cuc, Vietnam
  - Establishing a comprehensive regulatory model for a national reclamation system in Bahrain, Mr. Hassan Mubarak, Bahrain
  - Financing recovery, recycling and reclamation of refrigerants in Indonesia, Ms. Bitul Zulhasni, Indonesia
  - Developing ODS and HFC Banks inventories in Asia, Mr. Makoto Kato, OECC
  - WB LRM and ODS Disposal Studies, Mr. Jiang Ru, Manager, Global Environment, World Bank
  - *Moderator: Ms. Denise San Valentin, Programme Management Officer, CCAC Secretariat*
- Open Discussion
- Closing

PRACTICAL GUIDE FOR DEVELOPING NATIONAL PLANS FOR LIFECYCLE REFRIGERANT MANAGEMENT (LRM)

Cecilia T. Mercado
for CCAC/IGSD

OBJECTIVE OF THE SESSION

- Present key elements of the Practical Guide
- Seek audience feedback: Is this Guide useful for preparing National Action Plans for LRM?
- Identify gaps, needs needed to finalize the guide

Context And Urgency

- Record heat (2024 = warmest year ever) → rising cooling demand
- Old, inefficient equipment = large refrigerant banks
- Unmanaged banks = ODS & HFC emissions → ozone depletion + warming
- International momentum: ICJ Advisory Opinion (2025), EU F-Gas Reg., AIM Act, Japan F-Gas Law

Purpose Of The Guide

A practical tool to help countries:

- Turn refrigerant-bank inventories into action plans
- Integrate LRM with HPMPs, KIPs & Cooling Strategies
- Build policy, technical & financing systems for bank management

Target Users

- National Ozone Units (NOUs)
- Environment & Energy Ministries
- Implementing Agencies (UNEP, UNDP, UNIDO, World Bank)
- Industry & servicing sector partners

Content of the Guide

1. Introduction and Purpose of this Guide
2. The life-cycle refrigerant management (LRM) Framework for national action plans
3. Case studies: Examples of effective lifecycle refrigerant management (LRM) initiatives
4. Building the baseline: National inventories of banks of refrigerants
5. Step-by-step Guide to preparing an LRM-Aligned national action plan for refrigerant banks
6. Model national action plan template and performance indicators
7. Technical options for recovery, recycling, reuse and destruction
8. Conclusions and Policy recommendations

The LRM Framework

Key components:

1. Prevention & Leak Containment
2. Recovery & Recycling
3. Reclamation & Reuse
4. Destruction & Safe Disposal
5. Integration with HPMPs/KIPs and NDCs

What is a national action plan (NAP)

A NAP is a government-led, costed plan that:

- translates national refrigerant bank inventories into concrete, coordinated, and financially sustainable actions for managing used and unwanted refrigerants in an environmentally sound manner; and

- Is a planning tool and a policy instrument, aligning technical, regulatory, institutional, and financing measures needed to implement LRM nationally.

Why National Action Plans (NAPs)?

- Move from data (inventories) to implementation (actions)
- Define roles & responsibilities
- Identify costs and financing needs
- Establish tracking & reporting systems (MRV)

Building the Baseline: Inventories

- Foundation for all LRM actions
- Funded by the MLF or other funding sources (COPA
- Methodology: top-down (import data), bottom-up (equipment data), or hybrid approach of these two
- Stakeholder consultation critical for validation

From Inventory To Action

- Translate data into prioritized activities
- Link with existing HPMP/KIP actions
- Define collection networks and facilities
- Develop financing and business models

Eight Core Elements Of A NAP

1. Sources and Banks
2. Policy and Regulations
3. Collection, Transport, Storage
4. Roles and Responsibilities
5. Technology Options
6. Barriers and Solutions
7. Institutional Framework & Capacity Building
8. Costed Implementation Plan

Model NAP template

- Step-by-step structure aligned with MLF requirements
- Guidance boxes and sample indicators
- Adaptable to low-volume consuming countries
- Includes performance indicators for MRV

Financing Options

- Blend sources: MLF + national budgets + private sector
- Explore revolving funds, extended producer responsibility (EPR) schemes, public private partnership (PPP) models
- Revenues from reclaimed refrigerant can sustain operations

Monitoring, Reporting & Verification (MRV)

- Track recovered, reclaimed, destroyed refrigerants
- Integrate with customs and waste data
- Quantify avoided emissions in CO_2-eq
- Ensure transparency and funding eligibility

Technical Options

- Recovery and Recycling Units (local or mobile)
- Reclamation centres or regional hubs
- Destruction technologies: cement kilns, rotary kilns, plasma arc
- Regional or shared facilities for cost efficiency

Barriers to NAP implementation

- Weak enforcement and informal servicing sector
- Limited financing and infrastructure
- Data gaps and fragmented institutions
- Need for coordinated policy and training

Priority Near-Term Actions

- Mandate recovery and technician certification
- Embed LRM in HPMPs & KIPs
- Establish collection and reclamation hubs
- Assess national or regional destruction options
- Develop costed, prioritized NAPs
- Establish a country-specific business model for LRM

What do countries get from a well-developed NAP?

- Reduced ODS and HFC emissions
- Strengthened compliance with Montreal Protocol / Kigali Amendment
- Strategic and coordinated approach to LRM and banks
- Circular-economy jobs and skills
- Access to new funding opportunities

Discussion and feedback

Questions for participants:

1. Does this Guide meet your needs for LRM planning?

2. What elements need more detail or examples?

3. What support tools would help your country most?

(*Next steps*: collect comments and finalize Guide.)

THANK YOU

LIFE CYCLE REFRIGERANT MANAGEMENT
Development of Digital Tracking System

Nguyen Dang Thu Cuc

General Context

Climate Challenge & Cooling Demand

- Viet Nam is among the countries most affected by climate change, with record-high temperatures exceeding 44 °C in 2023–2024.
- Rising heat drives a rapid increase in cooling demand – in homes, commercial buildings, and industries – leading to growing use of refrigerants (ODS/HFCs).
- This surge, if unmanaged, risks turning refrigerants into major source of greenhouse-gas (GHG) emissions.

Aim to **cut over 11 $MtCO_2eq$** by 2045 from consumption of HFCs (~ 200 **$MtCO_2eq$** avoided emissions)

Montreal Protocol and Vienna Convention

Kigali Amendment

Global Cooling Pledge

240 $MtCO_2eq$

Avoided emissions calculated till Aug, 2025 (Country profile)

- Preparing NDC 3.0 (2026–2035) to strengthen mitigation measures – including LRM, toward Net Zero by 2050.

- LRM represents a cross-cutting solution that links: refrigerant phase-down (Montreal Protocol), energy efficiency (cooling demand management), and circular-economy approaches (recovery, reclamation, destruction).

🌞 Heat ↑ → ❄️ Cooling Demand ↑ → 🧪 Refrigerants ↑ → 🌫️ Emissions ↑

Viet Nam's Refrigerant Management Scheme

(Decree No. 06/2022/ND-CP on Mitigation of Green House Gas (GHG) Emissions and Protection of Ozone Layer, and its Amendment Decree No. 119/2025/ND-CP)

1. Organization engaged in the production of controlled substances
2. Organizations engaged in the export and import of controlled substances
3. Organizations that manufacture or import equipment or products containing or made from controlled substances
4. Organizations that own equipment containing controlled substances: air conditioners with a rated cooling capacity greater than 26.5 kW (90,000 BTU/h); industrial refrigeration equipment with an electrical capacity greater than 40 kW
5. Organization providing collection, recycling, reuse and treatment services for controlled substances

Electronic portal

Ongoing Workstreams for Comprehensive LRM

Complementary work streams operate in parallel to build Viet Nam's LRM capacity. Success requires harmonisation between these streams and alignment with broader environmental policy frameworks.

Digital MRV System / REF Next (CCAC)	Inventory & Planning (MLF)
❑ Builds data infrastructure and reporting mechanism under Decree 06/Decree 119. ❑ Pilots system in Ho Chi Minh City to test usability and data accuracy with real-world participants (hotels, buildings, service companies) ❑ Enables transparent monitoring, reporting, and verification for the cooling sector ❑ Creates foundation for scalable national implementation	❑ Establishes national baseline for refrigerant banks. ❑ Challenges and gaps identified to be tackled: incentives, technicians, non-disposal cylinders, logistics, EPR, e-waste management, trans-boundary movements; ❑ Provides essential policy foundation for recovery, reclamation, and destruction schemes. ❑ More resources & government participation needed to move into implementation of the plans.

Vietnam – Develop an MRV framework to track Kigali Amendment Commitments

Duration
2024-2026

IMPLEMENTING PARTNERS
Overseas Environmental Cooperation Center, Japan (OECC)
Ecology and Environment Institute (EEI)
In collaboration with the Ministry of the Envrionment, Japan (MOEJ)

Expected Output:

- **Development of Guidelines on MRV of HFC and HFC tracking**
- **Model HFC inventory through pilot activities**
  - Expect to launch December 2025 through September 2026, engaging hotels, industrial facilities, and service companies. Participants receive complimentary accounts during the pilot phase and report digitally to DCC.
- **Prototype electronic system of HFC tracking system (through RefNEXT)**
  - Designed in partnership with GenbaNEXT during 2024-25, this digital platform tracks each step of LRM through an innovative logbook function. The system captures critical data on refilling, recovery, reclamation, and destruction activities.
- **Government platform integration**
  - RefNEXT integrates seamlessly with Viet Nam's government online platform for registration and reporting.

Progress to date:

- Developed **international practices regarding MRV and tracking of HFC consumptions and emissions**.
- Develop **draft guidelines on MRV of HFC and HFC tracking**.
- Conduct HFC data collection from consumption, collection (e.g. recovery and reclamation) and destruction by selected facilities/corporates in 05 cities: Hanoi, Ho Chi Minh, Hai Phong, Da Nang, Can Tho. **350/782 surveys** received from selected facilities/corporates
- Develop an **electronicy tracking sytem** for the purpuse of enabling all mandated/registered HFC users/emitters to report their legally appropriate reponses to the Government **(through RefNEXT)**

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Online Public Service Portal – RefNEXT Integration

GenbaNEXT

*Department of Climate Change, Ministry of Agriculture and Environment, Department of Digital Transformation

CỔNG DỊCH VỤ CÔNG
BỘ TÀI NGUYÊN VÀ MÔI TRƯỜNG

Verified Data stored and archived on Portal

Government Entities

MOIT (Ministry of Industry and Trade)

Online Public Service Portal

Refrigerants Import Data

Step 1
Verify and Confirm Data collected on RefNEXT

1 API
2 Server Upload

Government Side

Industry Side

Additional Features:
1 Alerts
2 Analysis (Imports, Recycled, Use By Sector; Dealer/Contractor/Manufacturer wise Compliance etc.)

RefNEXT

Customer/ Building Owner

AC/Refrigeration Manufacturers

Dealers/Contractors/Technicians

Recycling Companies

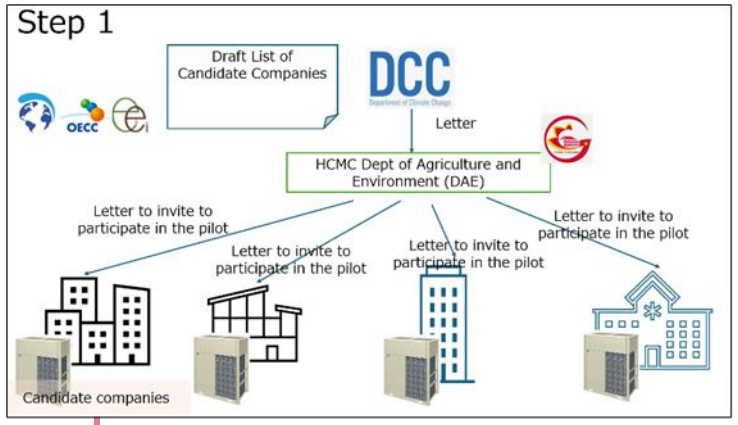
Destruction Companies

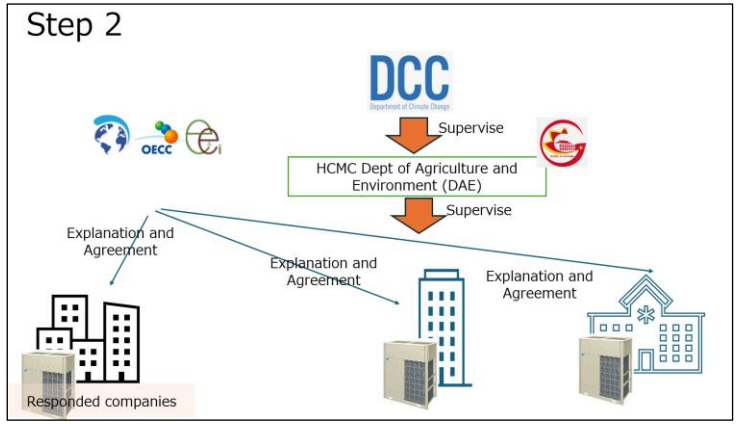
Use and Recovery

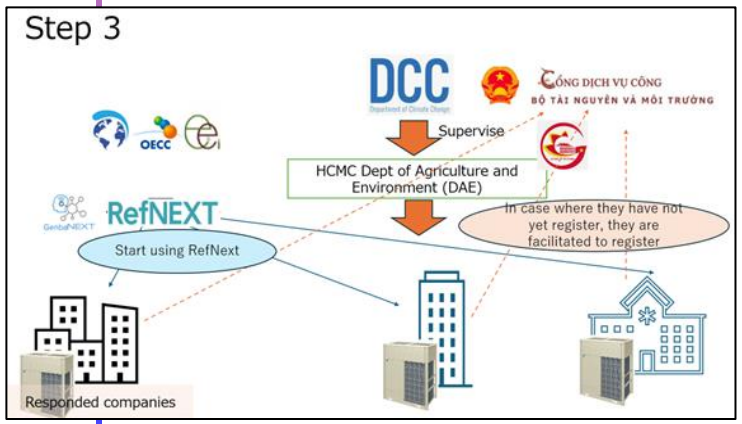
Reclamation

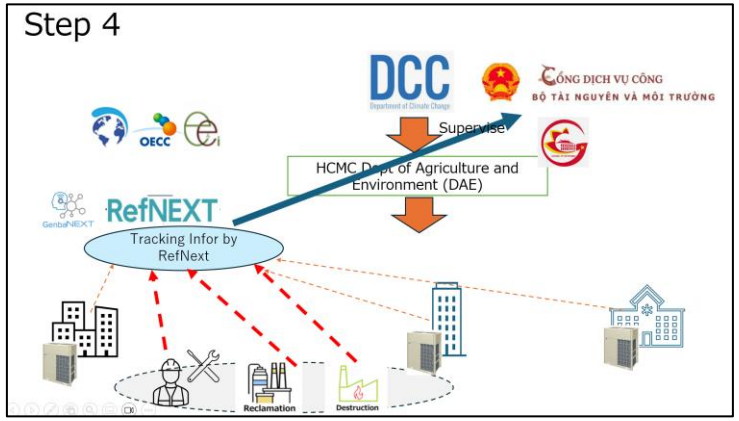
Destruction

Pilot Activities for ODS/HFC Refrigerant Digital Tracking System









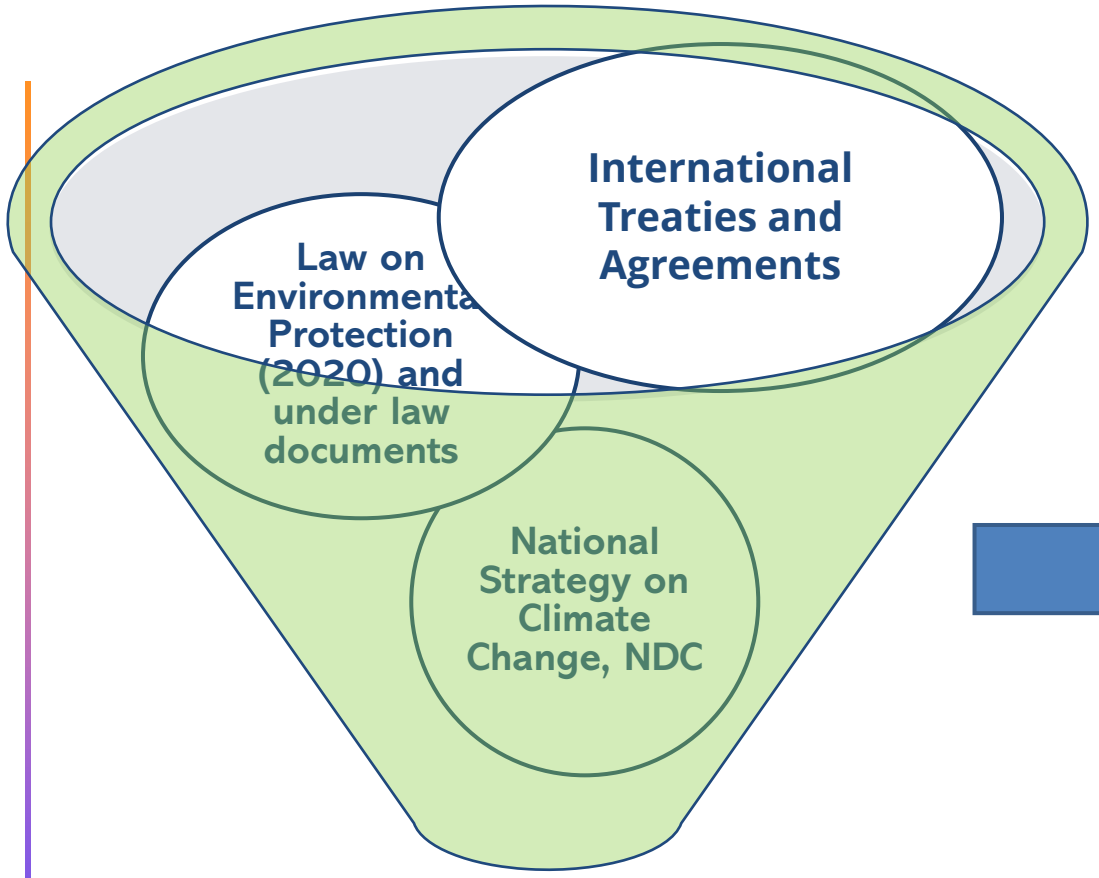
Target Participants

Organizations own equipment containing controlled substances obliged under Decree 06/119

Organizations with a plan for Refilling; Recycling; Replacement of equipment in next 6 months

Organizations which provide consent on the activities, bearing cost of refrigerant (refilling-recovery-reclamation-destruction)

CONTRIBUTING TO NATIONAL CLIMATE AND ENVIRONMENT OBJECTIVES



Net zero target by 2050

COP26 implementation plan;
National Climate Change Strategy
Methane Emission Reduction Action Plan
National Plan for Management and Elimination of Controlled Substances

- Strengthen **quota allocation** and usage-allowance control for controlled substances.
- Enhance **life-cycle and end-of-life** management of substances and equipment.
- Improve **technician training** and **certification** to reduce leakage.
- Promote **technology transition** and energy-efficient cooling solutions.
- Maintain robust **national inventories and monitoring** systems.
- Develop linkages to **carbon markets** and **other incentive** mechanisms.

DCC
Department of Climate Change

Thank you for your attention!

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