Measures on HFC management and Energy Efficiency in the context of Climate Change

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IFL Secretariat

INITIATIVE ON FLUOROCARBONS LIFE CYCLE MANAGEMENT

1.Background

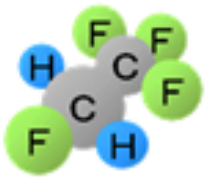
Life Cycle of Fluorocarbons

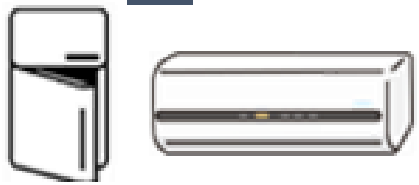
Production

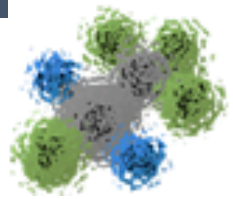
Use as refrigerant

Recovery

Recycle/ Destruction







UN environment programme | ozone secretariat

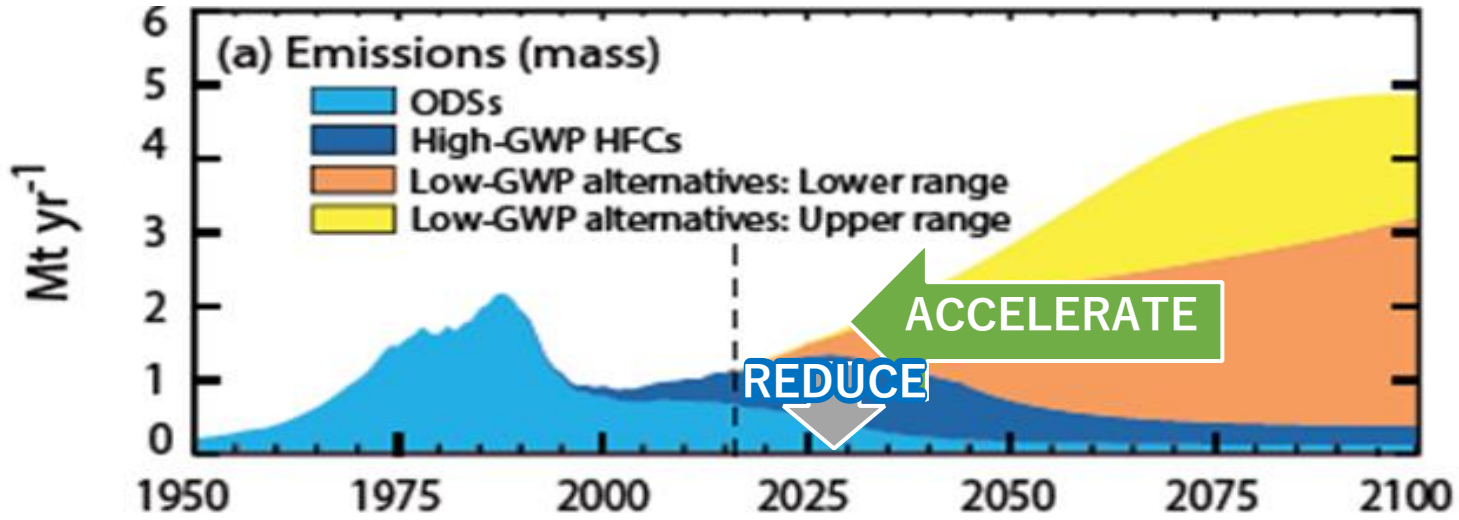
Montreal Protocol covers control on production and consumption

Efforts for preventing leakage, recovery and destruction are under responsibility of countries domestic efforts

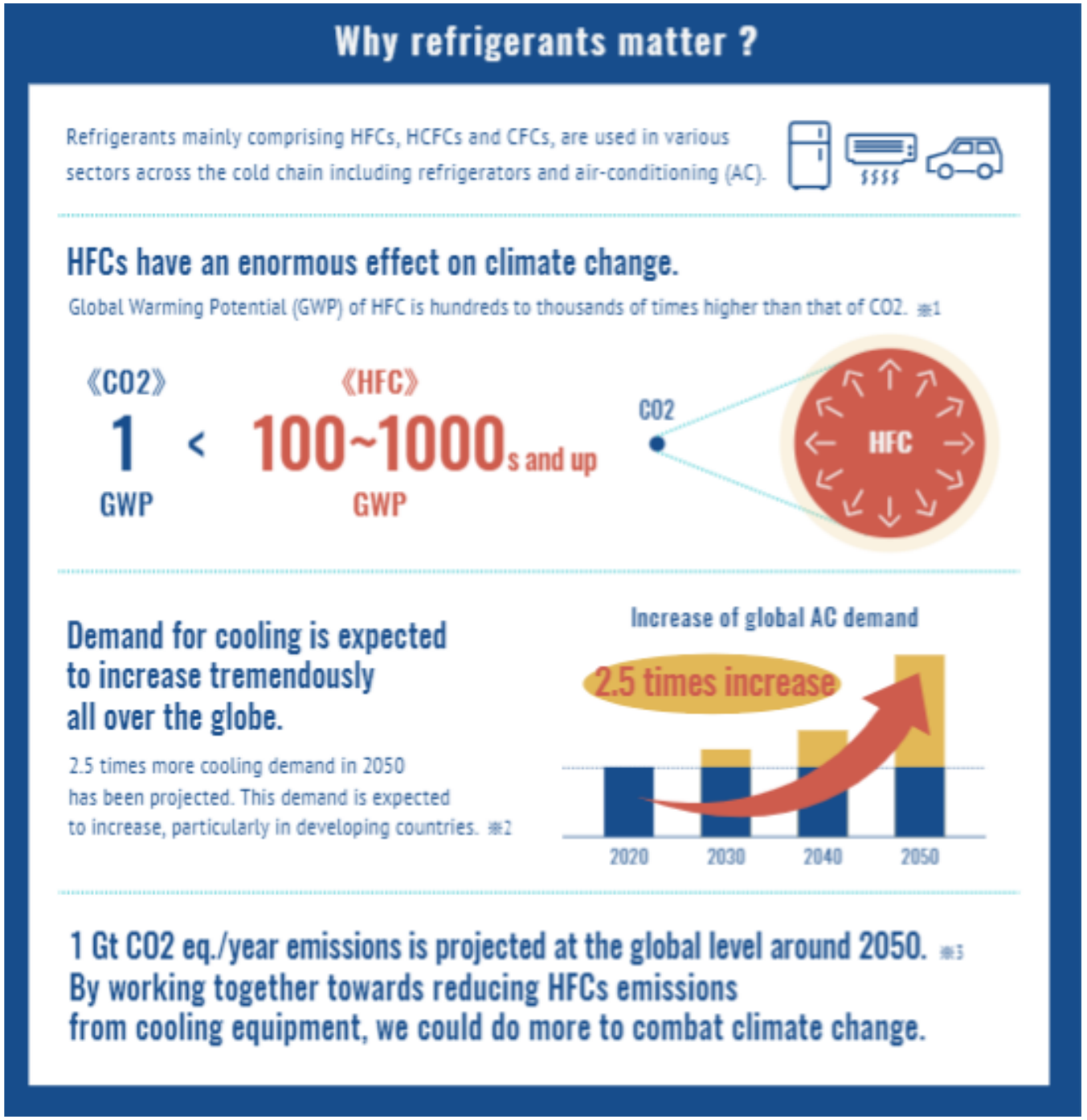
Without efforts by countries, ODS and HFC banks will be released to the atmosphere ➔ Risks of Bank Issue

Importance of addressing the fluorocarbons banks

- Fluorocarbons control is important for both **ozone layer protection** and **climate change mitigation**
- **Refrigerants demand** is expected to **increase dramatically** as the demand for cooling rises.
- **Even with the production and consumption control of HFCs under the Kigali Amendment, the HFCs emission is expected to increase approx. 2 billion t-CO2e** (WMO/UNEP2018).
- **A clear need exists to address fluorocarbons emissions comprehensively**, given the exponentially growing volume of HFCs and remaining ODSs.
- **Life cycle management** of fluorocarbons means to **reduce consumption, block leakage in use, recover, destroy, and recycle of fluorocarbons instead of discharging into the air at disposal**.



Source: Scientific Assessment of Ozone Depletion: 2018 (WMO, 2018)



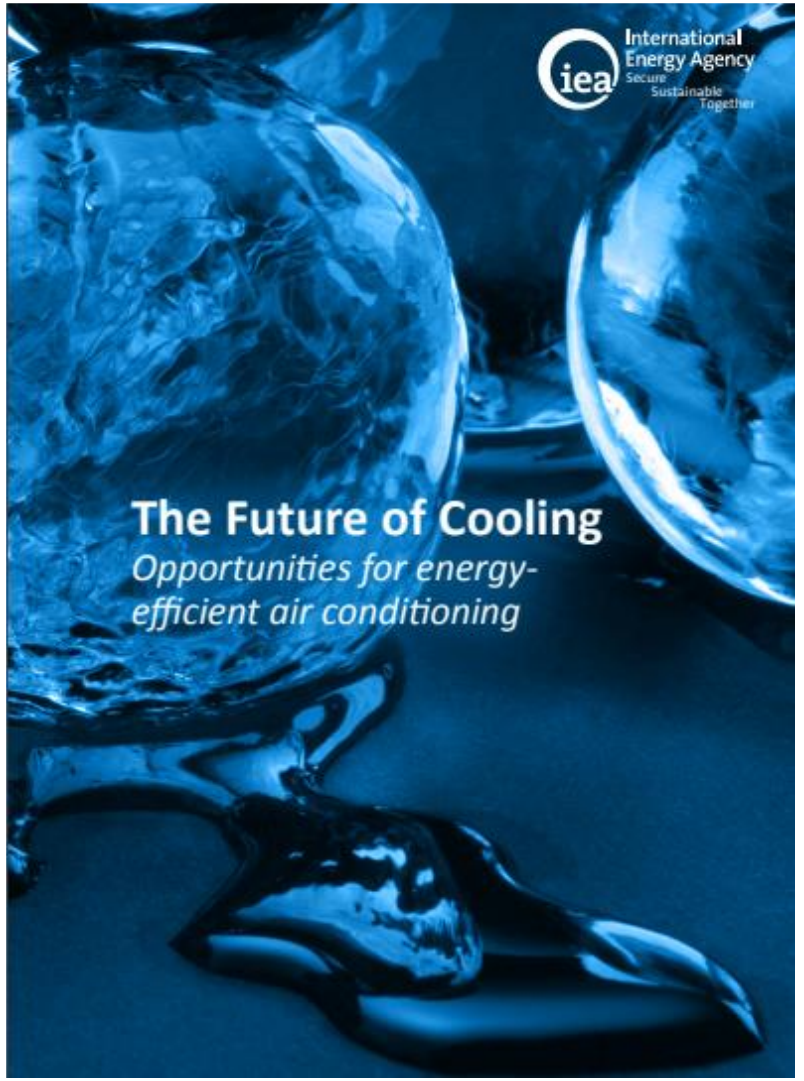
Working on the cooling sector really matters!

- Addressing HFCs with high global warming potential (GWP) will provide a big contribution to climate change mitigation
- The cooling sector is really growing its demand, especially in Asia. Asian countries can take the lead for the cooling sector action, through the life cycle management.

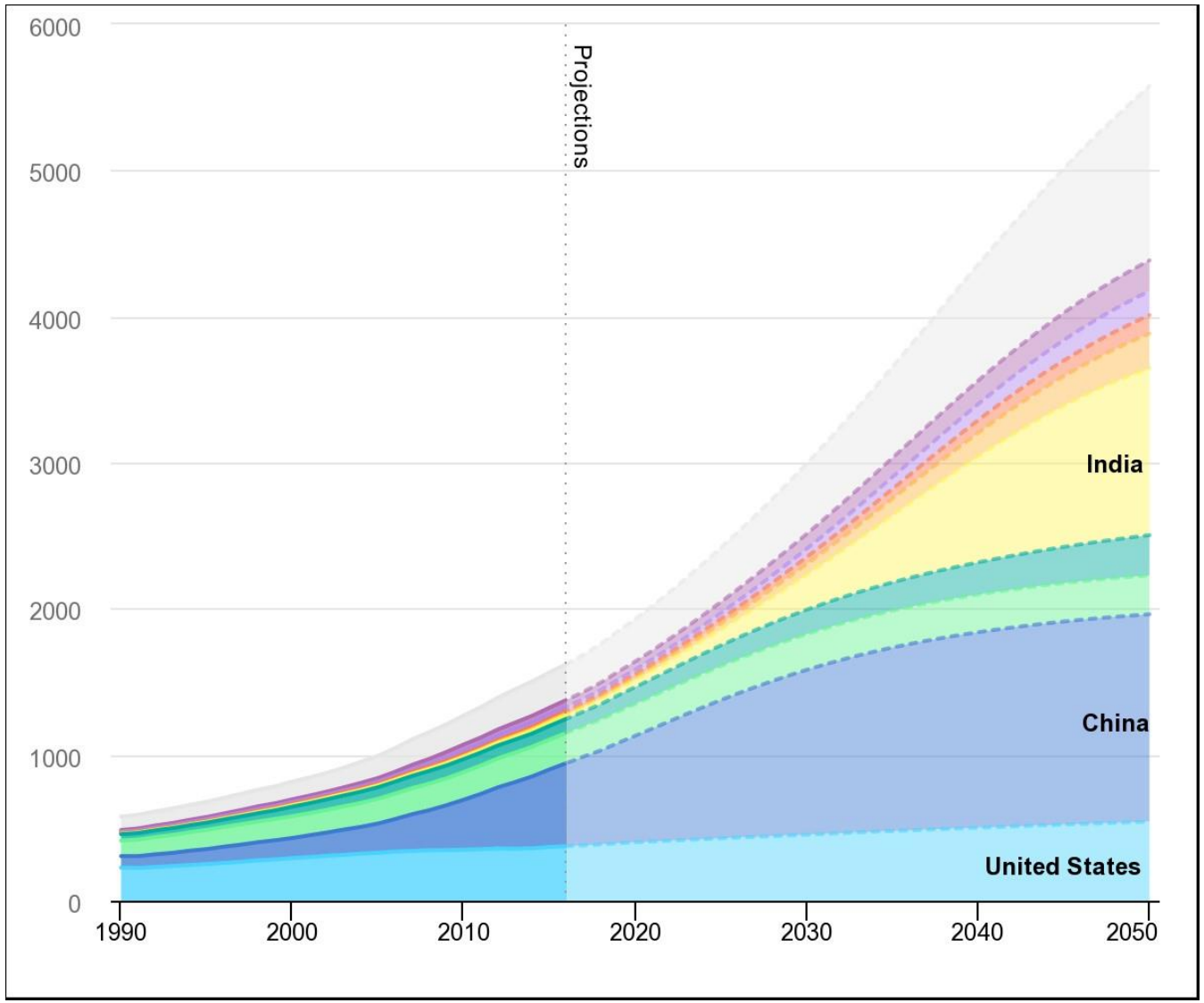
Cooling in the context of energy and climate

Growing demand for air conditioners is one of the most critical blind spots in today's energy debate.

Setting higher efficiency standards for cooling is one of the easiest steps governments can take to reduce the need for new power plants, cut emissions and reduce costs at the same time.



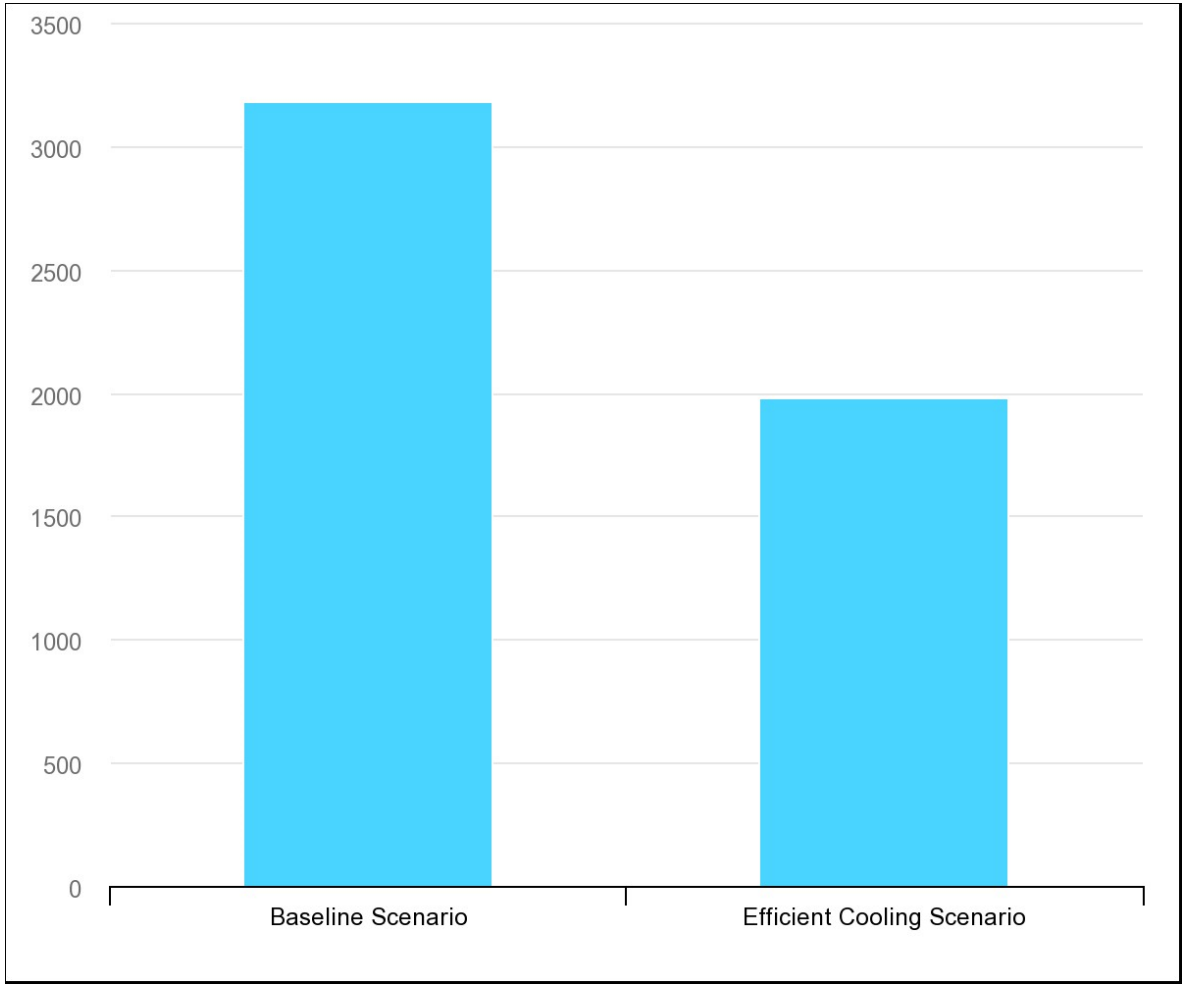
Projected increase of stock of Air Conditioner



Global air conditioner stock, 1990-2050 (IEA2018)

- Due to demand of cooling, global stock of air conditioner is increasing in a massive scale, especially in hot developing countries.
- This phenomena has given an extra pressure in the energy development.

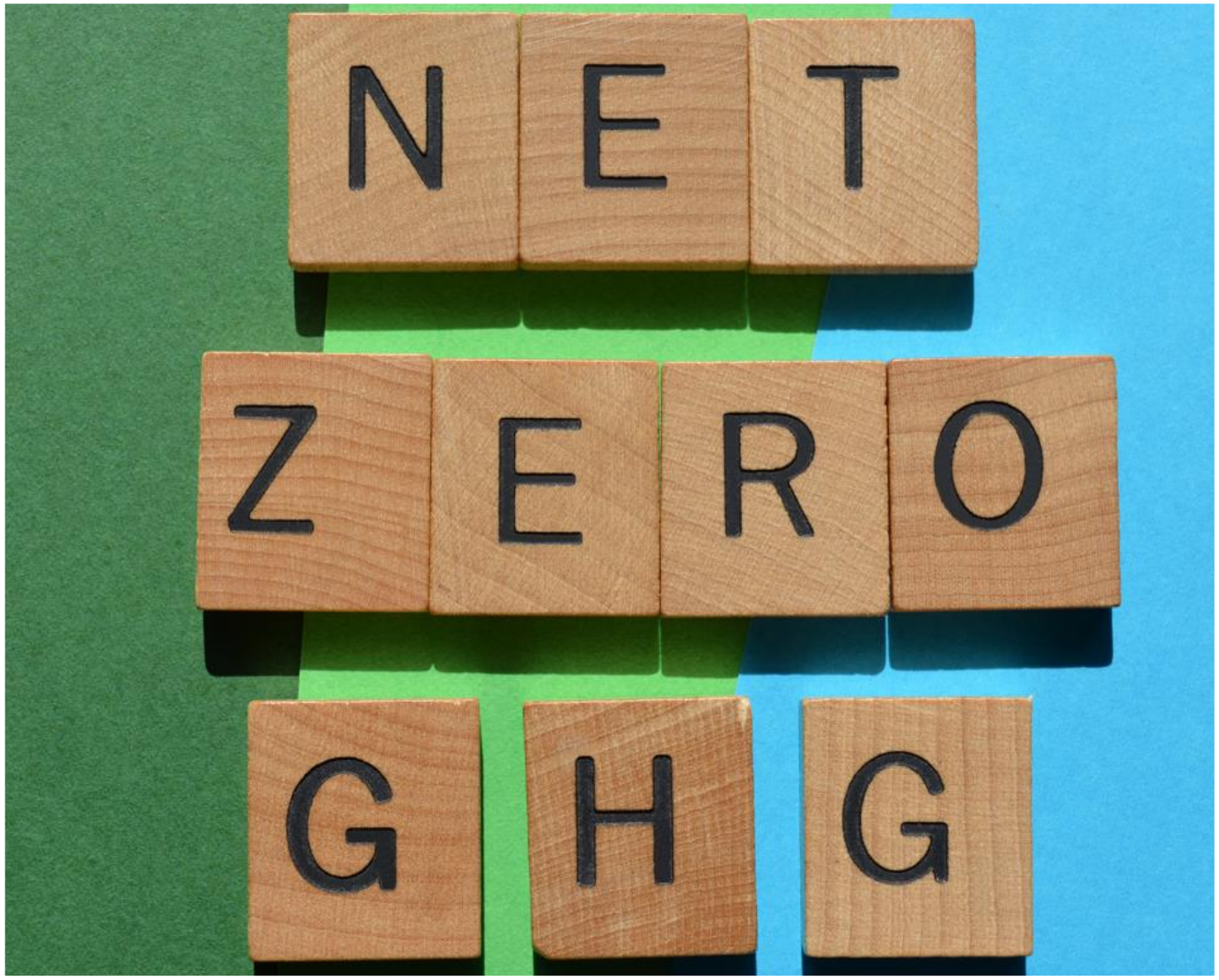
Efficient Cooling is less expensive at all



Cumulative investments in power generation for space cooling to 2050, baseline and cooling scenario (IEA2018)

- The Efficient Cooling Scenario reduces investment and running costs by USD 3 trillion between now and 2050. Average cooling energy costs would be almost halved.
- And it plays a key role in demand side management of energy and climate change mitigation.

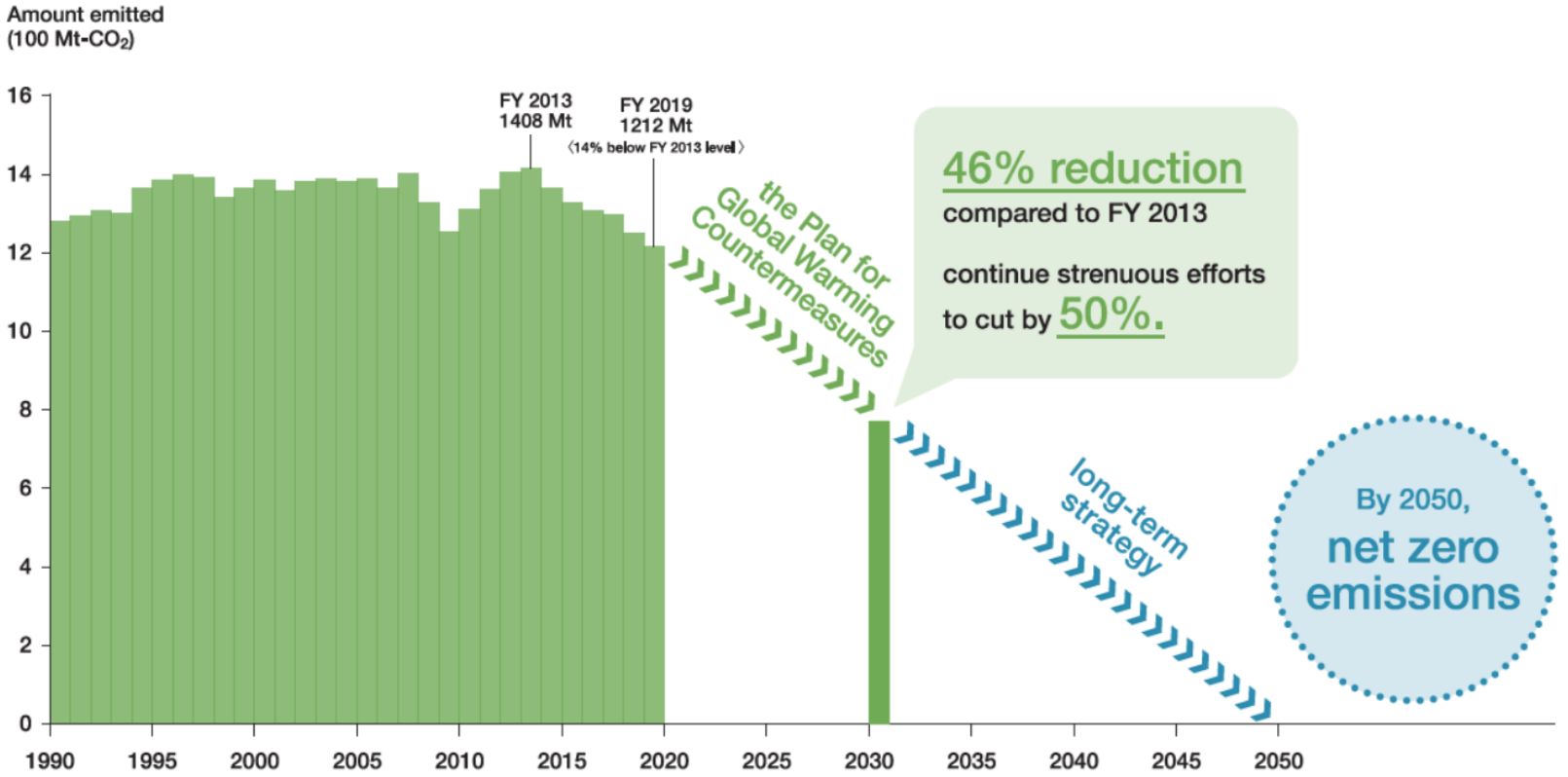
Fluorocarbons in the context of climate change



COP21 · CMP11
PARIS 2015
UN CLIMATE CHANGE CONFERENCE

Japan's NDC and Long-term Strategy with HFCs

- Japan aims to reduce its greenhouse gas emissions **by 46 percent in fiscal year 2030** from its fiscal year 2013 levels, setting an ambitious target which is aligned **with the long-term goal of achieving net-zero by 2050**.
- For **Hydrofluorocarbons (HFCs),** Japan aims to reduce its emissions **by 55 percent in fiscal year 2030** from its fiscal year 2013 levels.



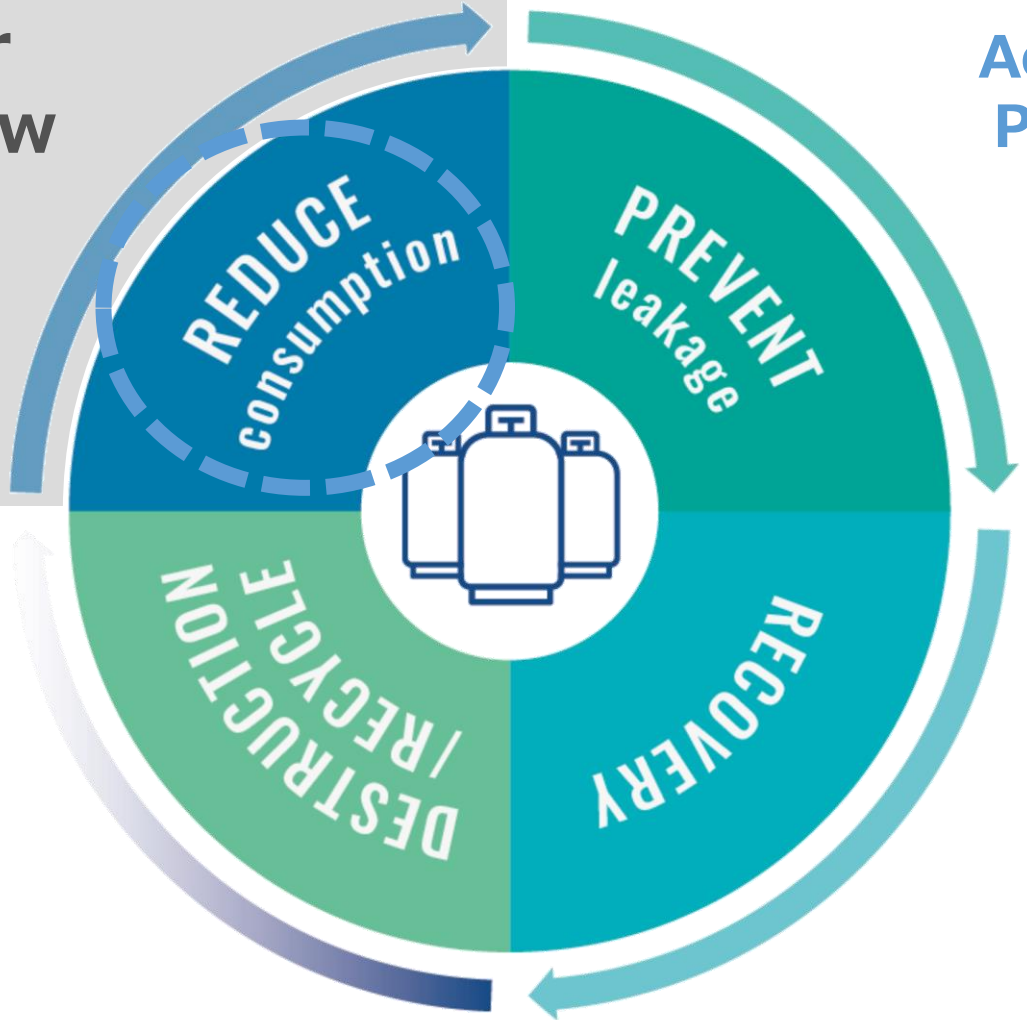
Source: Prepared from "Greenhouse Gas Emissions in FY 2019 (Confirmed)" and "Global Warming Countermeasures Plan"

Regulations on ODS and HFCs in Japan

■ Regulating HFCs from upstream to downstream, life cycle management of HFCs, is effective in achieving its smooth phase-down and emission reduction.

Ozone Layer Protection Law

Phase-out of CFCs & HCFCs
Phase-down of HFCs



Act on Rational Use and Proper Management of Fluorocarbons

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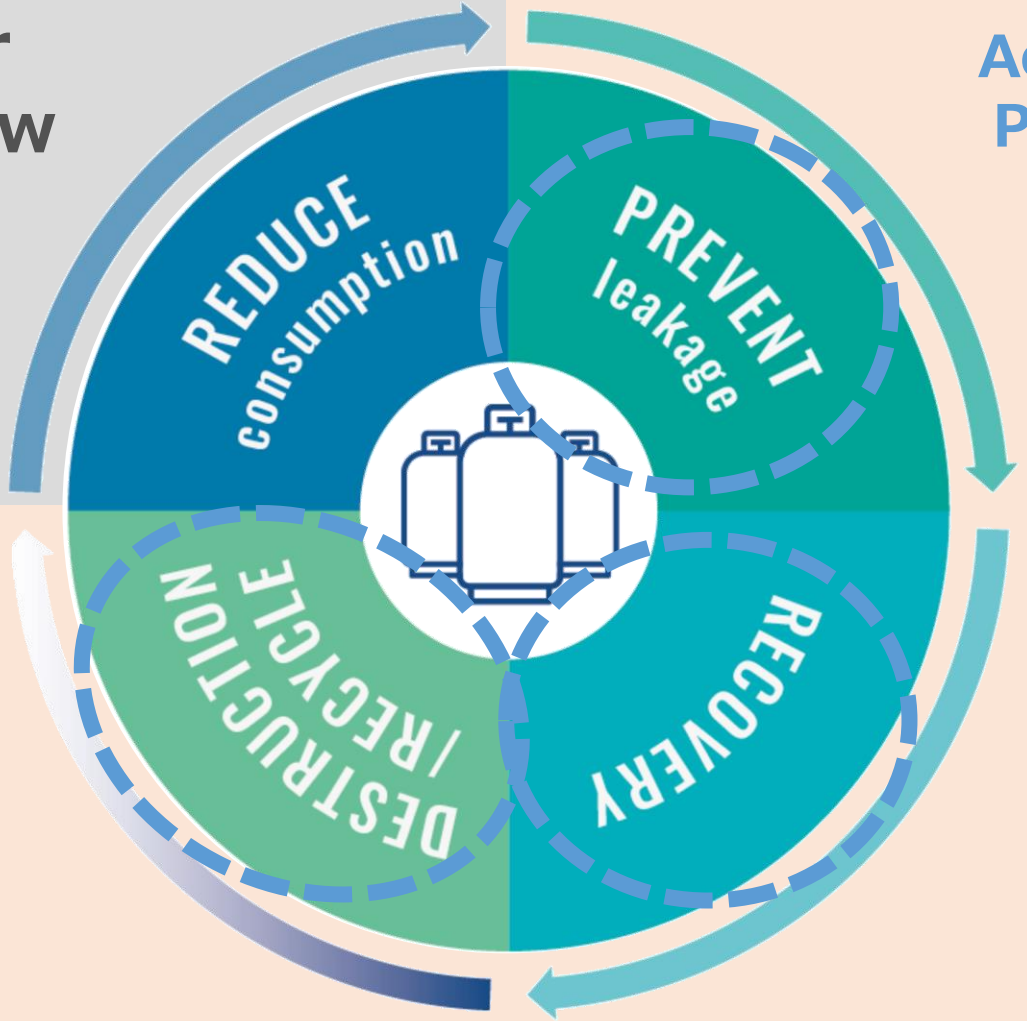


Act on Rational Use and Proper Management of Fluorocarbons

RAC Users etc.:
Proper Management of Refrigerants in RAC
✓ Report of Leakage
✓ Inspection/ Log Book
✓ Proper Disposal

Registered Filling & Recovery Operators:
Proper Filling & Recovery of Fluorocarbons

Approved Recycling/Destruction Operators:
Proper Recycling/Destruction of Fluorocarbons

Status HFCs under NDCs of Asian countries

Country	HFCs emission target and measures stated in NDC	Ratification of the Kigali Amendment	Amount of Consumption (mODP-t) (2020)				
			HFC	HCFC	Consumption limit	%	CFC
Vietnam	Included in scope, reduction of consumptions and life cycle management (NDC 2022)	Sep 2019	9.4	142.18	143.8	98.9	0
Thailand	Included in scope, no measures specified in NDC (NDC2022)	Not yet	N/A	350.11	602.9	58.1	0
Philippines	Included in the scope, preparation for implementation (NDC 2021)	Nov 2022	7.2	50.62	105.29	48.1	0
Indonesia	Not yet in the scope (NDC 2022)	Nov 2022	N/A	188.41	262.5	71.8	0
Malaysia	Included in the scope of GHG inventory-base target. No measures specified (NDC 2021)	Oct 2020	14.6	228.41	335.3	68.1	0
Cambodia	Included in scope, F-gas transition for room ACs and residential refrigerators (NDC, 2020)	Apr 2021	0.9	6.65	9.8	67.9	0
Sri Lanka	No reference to HFC, efficient cooling as a measure for energy (NDC 2021)	Sep 2018	0.5	8.57	9	95.2	0

The table is produced based on IFL Study under the MOEJ Programme

Efforts by Initiative on Fluorocarbons Life Cycle Management (IFL)

- **Reducing HFCs as NDC has immediate benefits of global GHG reduction.**

Reduction HFCs as high GWP GHG can contribute to accelerating the Paris Goal. There are an obvious gap to fill by adding HFC into NDC

- **Policy and technical resources deployed in countries**

Already capacity-building efforts are in progress in some developing countries, with expectation to scaling up efforts

- **CCAC Cooling Hub can accelerate the reduction efforts**

Good practices should be replicated among partners, including developing countries. We welcome partners to work together!

CLIMATE & CLEAN AIR COALITION TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

ADB

UNIDO

THE WORLD BANK

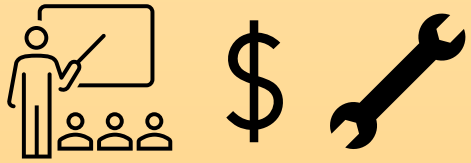
2. IFL Work Plan 2023

IFL Work Plan 2023- Action Menu

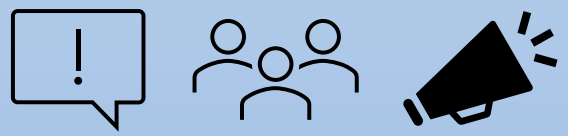
1. Mitigation ambition and transparency

2. Legislation and policy development

INITIATIVE ON FLUOROCARBONS LIFE CYCLE MANAGEMENT



3. Capacity development and investment support

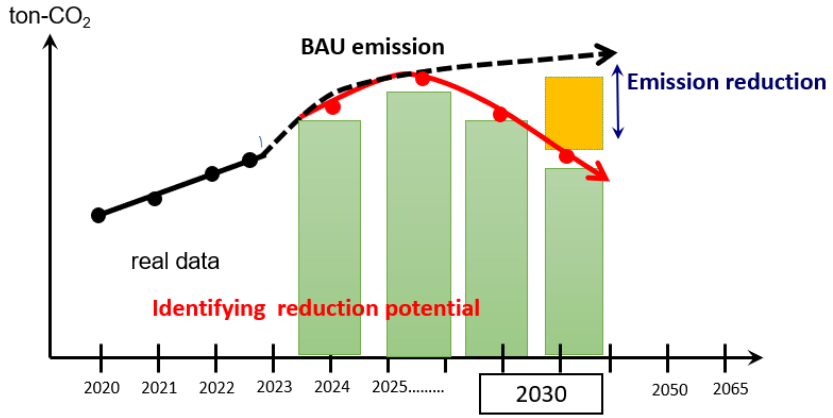


4. Outreach & awareness raising

IFL Work Plan 2023

1. Mitigation ambition and transparency

■Assessment of HFC emissions reduction potential as NDC



- Projecting BAU of HFC emissions
- Asessment of HFC emissions reduction potentials by HFC recovery and destruction/Converting to natual refrigerant

■HFC inventory under the Enhanced Transparency Framework (ETF)

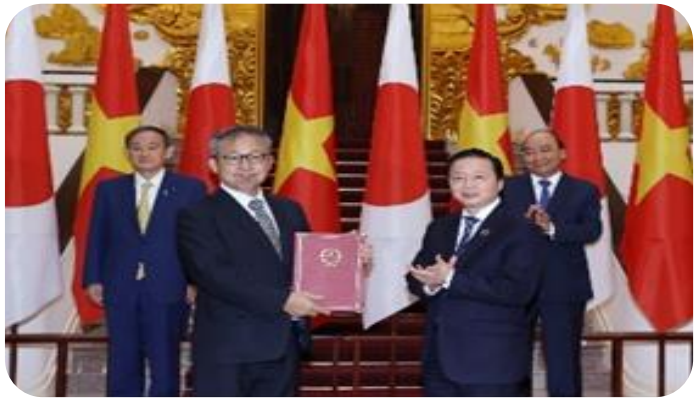
Table 5. HFC emission by gas and emission source 1994-2016 (Gg. CO_2-eq)

Emission source	Gas	1994	2000	2005	2010	2015	2016
2F1 - Refrigeration	HFC-125	NO	NO	0.08	1.38	4.73	5.54
	HFC143a	NO	NO	0.12	2.08	7.02	8.22
	HFC134a	NO	NO	0.13	2.27	7.70	9.34
	HFC-32	NO	NO	0.00	0.00	0.00	0.00
2F1 – Air conditioning	HFC-125	NO	NO	0.08	1.38	4.73	5.54
	HFC143a	NO	NO	0.00	0.00	0.00	0.00
	HFC134a	NO	NO	5.88	106.04	291.53	337.31
	HFC-32	NO	NO	0.05	0.91	4.38	5.54
2F3 - fire protection	HFC-227ea	NO	NO	0.00	0.06	0.16	0.19

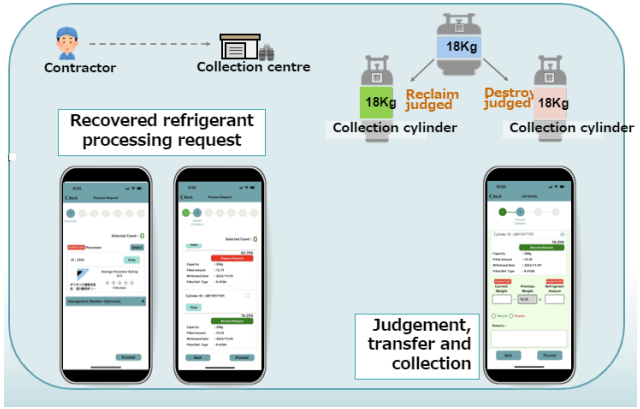
- Indonesia: Development of draft HFC inventory with a view to integration to BTR 1
- Malaysia and Thailand: Information sharing on basics of HFC inventory development

IFL Work Plan 2023

2. Legislation and policy development



- Viet Nam: Legislation support on the Revised Law on Environment Protection, its Decree and the national technical specification (QCVN)
- Malaysia: Preparing implementation rules for the Refrigeration Management Regulation 2020



HFC Tracking System

- Viet Nam: a demo project of the development of the HFC tracking system (TBD) , including the network development for proper management of refrigerants. system

IFL Work Plan 2023

3. Capacity development and investment support

■ Manuals/guidelines & training of technical experts

- Development of Technology Manual for HFC collection and destruction in local languages in Cambodia
- Technical training for refrigerant recovery and destruction in Cambodia, Thailand and Viet Nam

■Investment on HFC destruction infrastructure by the JCM

- Joint Crediting Mechanism (JCM) Project on used HFC Collection and Destruction by Combustion Technologies (Viet Nam, Philippines and Thailand)

IFL Work Plan 2023

QUAD(Australia, India, Japan, and US)
Workshop on Life Cycle Management at COP27

YouTube Video Materials

4. Outreach & awareness raising

■ Organizing workshops and seminars

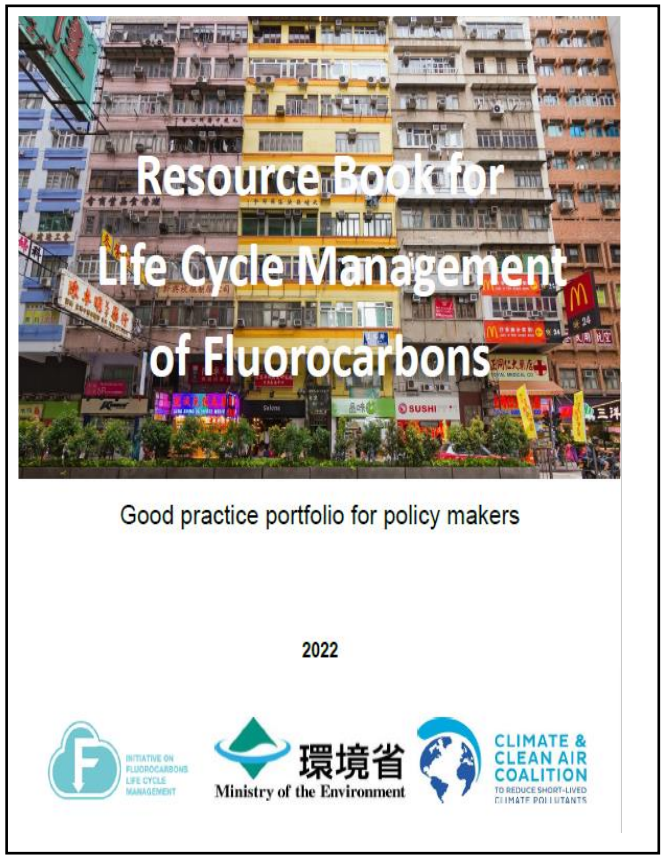
- Resource Book Seminar (online) in March
- Montreal Protocol OEWG 48 in Bangkok
- UNFCCC COP28 in Dubai

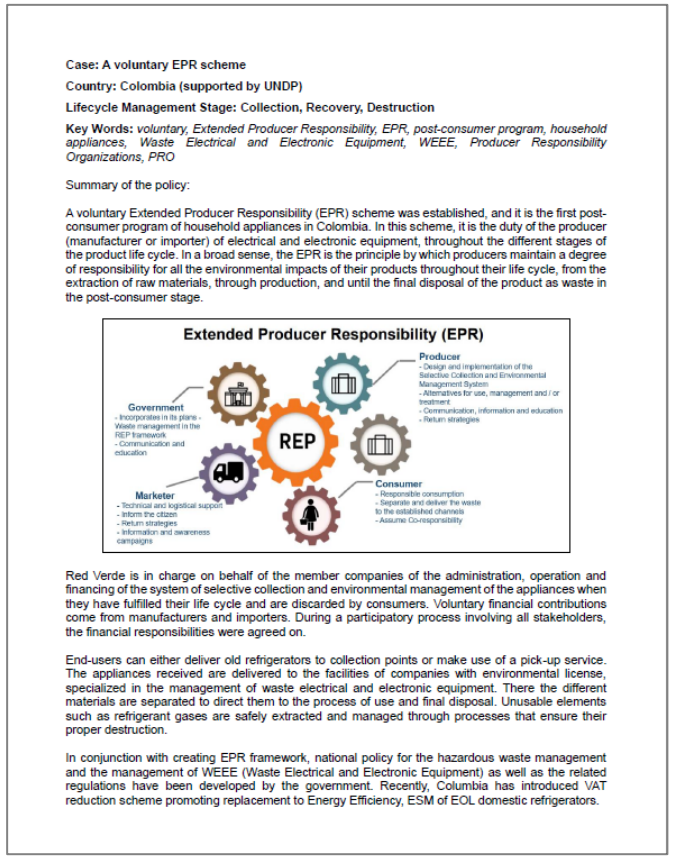
■ Disseminating materials

- Video, infographics and others regarding life cycle management approach

Resource Book for Good Practices of Policies & Measures

- The MOEJ and Climate and Clean Air Coalition (CCAC) launched **Resource Book for the Life cycle management of Fluorocarbons in 2022.**
- More than 20 good practices in all phases of fluorocarbons' life cycle from all over the world are showcased.





Case: A voluntary EPR scheme

Country: Colombia (supported by UNDP)

Lifecycle Management Stage: Collection, Recovery, Destruction

Key Words: *voluntary, Extended Producer Responsibility, EPR, post-consumer program, household appliances, Waste Electrical and Electronic Equipment, WEEE, Producer Responsibility Organizations, PRO*

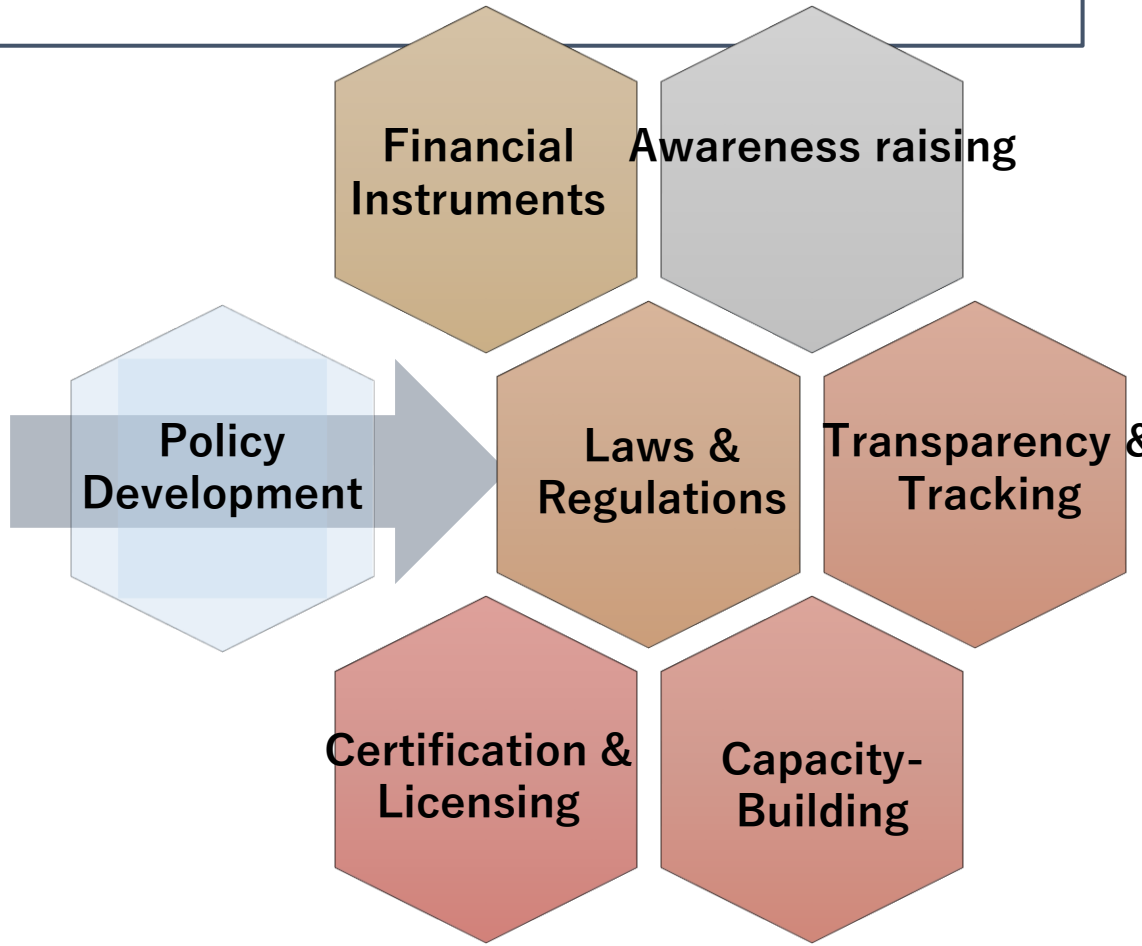
Summary of the policy:

A voluntary Extended Producer Responsibility (EPR) scheme was established, and it is the first post-consumer program of household appliances in Colombia. In this scheme, it is the duty of the producer (manufacturer or importer) of electrical and electronic equipment, throughout the different stages of the product life cycle. In a broad sense, the EPR is the principle by which producers maintain a degree of responsibility for all the environmental impacts of their products throughout their life cycle, from the extraction of raw materials, through production, and until the final disposal of the product as waste in the post-consumer stage.

Red Verde is in charge on behalf of the member companies of the administration, operation and financing of the system of selective collection and environmental management of the appliances when they have fulfilled their life cycle and are discarded by consumers. Voluntary financial contributions come from manufacturers and importers. During a participatory process involving all stakeholders, the financial responsibilities were agreed on.

End-users can either deliver old refrigerators to collection points or make use of a pick-up service. The appliances received are delivered to the facilities of companies with environmental license, specialized in the management of waste electrical and electronic equipment. There the different materials are separated to direct them to the process of use and final disposal. Unusable elements such as refrigerant gases are safely extracted and managed through processes that ensure their proper destruction.

In conjunction with creating EPR framework, national policy for the hazardous waste management and the management of WEEE (Waste Electrical and Electronic Equipment) as well as the related regulations have been developed by the government. Recently, Columbia has introduced VAT reduction scheme promoting replacement to Energy Efficiency, ESM of EOL domestic refrigerators.



Useful inputs provided by CCAC Cooling Hub Members

- Seeking possibilities of collaboration with international organizations, such as ADB, CCAC, and UNEP (including MLF) as well as private sectors

- Promotion of technology uptake on high-energy efficient equipment utilizing natural refrigerants and advanced practices of equipment maintenance and refrigerant recovery

Thank you very much

Visit here for more information on the Initiative!

http://www.env.go.jp/en/earth/ozone/fluorocarbon_initiative/index.html

https://www.youtube.com/channel/UCtFtrM-SzUUI6r87heLK-gA/videos