

## **Training Program for Fluorocarbons Life-cycle Management and High Energy Efficiency non-Fluorocarbons Appliances**

Organized by the Ministry of the Environment, Japan

Handled by the Overseas Environmental Cooperation Center, Japan, Institute for Global Reduction of Fluorocarbons and other GHG Emissions, and EX Research Institute Ltd.

### **1. Background and purpose**

In today's world, the cooling sector, especially in the developing countries, is rapidly growing along with the establishment of cold chains, due to improvements in quality of life, health condition, and food security, and becoming an important infrastructure for the transportation of vaccines. In "Cooling Emissions and Policy Synthesis Report" of IEA/UNEP published last year, it is pointed out that seventeen per cent of world's entire electricity is consumed in the cooling sector and that refrigerants used for recharging existing appliances are three times more than refrigerants used to pre-charge new appliances.

In the cooling sector, not only conversion of refrigerants is required by the Kigali Amendment of the Montreal Protocol, but also life-cycle management of fluorocarbons is needed, including energy efficiency achieved by high efficiency appliances. Currently, the emission of HCFCs and CFCs is around 1.5 billion CO<sub>2</sub> equivalent tons per year, and the emission of HFCs will increase from 900 million CO<sub>2</sub> equivalent tons to 2 billion CO<sub>2</sub> equivalent tons in year 2030 despite the effort by all nations to meet the Kigali Amendment's requirements. In the developing countries, measures to prevent leakage during usage and measures to recover and destroy/reclaim refrigerant from retired appliances are not adequate, and there is a good possibility of large-scale emission into the atmosphere. Moreover, these developing countries must meet the Kigali Amendment's requirements in the midst of the cooling sector's rapid growth. As a result, the cooling sector might not function at all unless high efficiency appliances will be prevailed and unless proper prevention of leakage and proper recovery of used refrigerants are in place. In the context of 1.5 degrees Celsius goal of the Paris Agreement, importance of efforts to manage fluorocarbons life-cycle as a measure against climate change has been increasing even for developing countries.

Japan has many technologies, such as high energy efficiency appliances (non-fluorocarbons or low GWP refrigerant) and remote-controlled leakage detection system effective to both prevention of leakage and energy efficiency. And Japan has adopted and improved life-cycle management of

fluorocarbons, including collection, reclamation and destruction since 1990s. The measures to prevent leakage and the measures to collect and reclaim/destroy fluorocarbons have been updated to reflect the actual circumstance of usage and distribution routes of home appliance, automobile air-conditioners and commercial appliances. In addition, Japan launched the Initiative on Fluorocarbons Life Cycle Management (IFL) at the 25th Conference of the Parties to the UNFCCC in 2019.

The purpose of this training program is to enhance understanding of life-cycle management of fluorocarbons and high-efficiency appliances, by sharing Japanese experiences and technology information, to promote fluorocarbons' emission reduction, and to contribute to the protection of the Ozone Layer and mitigation of climate change in Asia by incorporating these knowledges into future actions of the participating countries.

## **2. Aim of this fiscal year's training**

Along with development of regulations and market challenges in the developing countries, in order to smoothly transit from refrigerants with ODS to HFCs to low-GWP refrigerants and to sustainably utilize cooling sector in the context of the Kigali Amendment, countries in Asia should build a social system, in which (1) leakage from the appliances in use is prevented and (2) release into the atmosphere from discarded appliances are prevented by recovery, recycling, and destruction of refrigerants in these appliances.

In the FY2020's training program, both institutional and technological aspects of desirable management of entire Fluorocarbons life-cycle, such as production, usage as refrigerants, recovery and reclamation/destruction, are introduced and discussed. In FY2021, the aim of the training program is to further enhance your understanding of both institutional and technological aspects of Fluorocarbons life-cycle management by placing more focus on the middle-stream and downstream, in another words, usage as refrigerants, recovery and reclamation/destruction. Regarding (1) leakage from the appliances in use, data analysis leakage detection system and leakage-preventing installation technology are planned to be introduced. Regarding (2) refrigerants from discarded appliances, logical explanation of sustainable collection mechanism is planned in institutional aspect, i.e.,

- (a) importance of handing over discarded appliances and refrigerants to formal collectors
- (b) framework to foster formal collectors
- (c) framework to sufficiently cover costs to collectors

For technological aspect, understanding of actual practices and cautionary points of creating rules, guidelines, or manuals in each step of recovery, reclamation, and destruction will be promoted by lectures, video presentations, and discussions.

Note: regarding reclamation, a collection and reclamation network in Malaysia was introduced by Taiyoshoji in FY 2020 training.

In addition to the presentation of each country's efforts' current status since FY2020's training in the first session of this year's training, participating countries are expected to present future action plans

of fluorocarbons life-cycle management in the third session of the training, by taking into account what has been learned in the lectures, discussions, and online bilateral coaching sessions.

### **3. Expected participants**

Government officers and industry stakeholders in Cambodia, Indonesia, Malaysia, the Philippines, Sri Lanka, Thailand, and Viet Nam.

### **4. Training format**

Due to the spread of COVID-19, three of 3 hours online training sessions are planned for this year's program.

### **5. Schedule of 3 sessions**

First session will take place on December 9, 2021, Thursday 15:00-18:00 (JST)

Second session is currently planned on January 18, 2022, Tuesday 15:00-18:00 (JST)

Third session is currently planned on February 22, 2022, Tuesday 15:00-18:00 (JST)

Times are the same for all 3 sessions:

Cambodia (ICT) 13:00-16:00

Indonesia (WIB) 13:00-16:00

Malaysia (MYT) 14:00-17:00

The Philippines (PST) 14:00-17:00

Sri Lanka (SLST) 11:30-14:30

Thailand (ICT) 13:00-16:00

Viet Nam (ICT) 13:00-16:00

### **6. Details of Training**

This training program consists of lectures, discussions, and introductory videos.

Objectives of this fiscal year's training program are as follows:

1. To understand the differences between the participant's country's existing system and Japanese system by learning Japanese regulatory framework regarding fluorocarbons life-cycle management, such as Act on Rational Use and Proper Management of Fluorocarbons and to understand the options for future measures.
2. To learn the relevant efforts which are the pre-conditions for introduction of high-efficiency and low-GWP appliances. For example, efforts to prevent leakage, to recover and reclaim/destroy fluorocarbons as measures of fluorocarbons life-cycle management, and efforts to properly manage temperature at offices or hotels as measures to reduce greenhouse gas emission by saving energy are expected to be considered by the participants. In order to contribute to the consideration under No.3, to deepen the

- understanding of the knowledge of high-energy efficient non-fluorocarbon or low-GWP appliances, and the actual efforts to manage fluorocarbons life-cycle, such as leakage prevention measures, implementation of recovery, reclamation and destruction, etc., and the measures to reduce GHGs by saving energy by management of appliances.
3. With the knowledge obtained in No.1 and No.2, to share among the participants the detailed actions to implement each country's action plan, which was created last year and revisions will be made if necessary by considering the further actions after this training.
  4. To consider optimal measures suitable to each country's situation by the consultation regarding the measures to meet each country's challenges and the measures to implement action plan more effectively through bilateral coaching sessions with participating officers.
  5. To enhance understanding of actual measures to manage fluorocarbons life-cycle by communicating with each country officers, Japanese officers, and industry stakeholders.

### Curriculum

	Contents	Presenters
First session: December 9, 2021, Thursday (3 hours)		
(1)	Welcome remark from the Ministry of the Environment, Japan	- Ministry of the Environment, Japan (MOEJ)
(2)	Training objectives, orientation, and review of the last year's training 15 mins Self-introduction of participants 15 mins	- Overseas Environmental Cooperation Center (OECC)
(3)	<u>Lecture</u> : Importance of the Fluorocarbons Life Cycle Management 25 mins (including 5 mins Q&As)	Ministry of the Environment, Japan
(4)	<u>Lecture</u> : Importance of handing over end-of-life appliances and refrigerants to formal treatment route by their users 20 mins (including 5 mins Q&As)	- <u>Mr. Junya KIKUHARA</u> , Senior Consultant, EX Research Institute Ltd.
(5)	<u>Lecture</u> : Prevention of leakage and proper recovery of refrigerants 20 mins (including 5 minutes Q&As)	- <u>Mr. Shiro KASAI</u> , Japan Association of Refrigeration and Air-Conditioning Contractors (JARAC)
Break (15 mins)		
(6)	<u>Presentation</u> : Sharing of current status of the participating country's action plans since the training of FY2020 (10 mins X 7 countries) Q&As and Discussion	- Representatives of participating countries

	70 mins	
Conduct individually bilateral communications and initiate coaching on the action plans of the participating countries after the first session.		
Second session: January 18, 2022 (3 hours)		
(1)	Guidance on today's training 25mins	- <u>Mr. Makoto KATO</u> , OECC
(2)	<u>Introduction to technologies (video)</u> : Remote leakage detection system and leakage prevention implementing technology 20 mins (including 5 minutes Q&As)	- Daikin Industries, Ltd. - Emu-zetto Co., Ltd.
(3)	<u>Introduction to technologies (video)</u> : Merits, technology, scheme and regulations, manuals for proper recovery of refrigerants 20 mins (including 5 minutes Q&As)	- Ichinen TASC0 Co., Ltd.
(4)	<u>Introduction to technologies (video)</u> : (Tentative) Introduction of destruction technology 20 mins (including 5 minutes Q&As)	- Marubeni Corporation
Break (15 mins)		
(5)	<u>Lecture</u> : Schemes to assure appropriate fees to collection and maintenance business contractors 20 mins (including 5 minutes Q&As)	- <u>Mr. Toshihiko KASAI</u> , President of Institute for Global Reduction of Fluorocarbons and other GHG Emissions
(6)	Discussion and networking between participating countries and Japanese technology experts and industries 60 mins	- Participating countries - Technology experts and industries from Japan
Conduct individually coaching on the action plans of the participating countries between second and third sessions		
Third session: February 22, 2022 (3 hours)		
(1)	Review of the 1st and 2nd sessions 30 mins	<u>Mr. Makoto KATO</u> , OECC
(2)	<u>Discussion</u> : Discussion on the action plans of the	- Representatives of participating countries

	participating countries created with individual coaching between the sessions and on the details of the plan for year 2022 40 mins (10 mins x 4 countries) + 20 mins (Q&As)	- Facilitator: Mr. Toshihiko KASAI, President of Institute for Global Reduction of Fluorocarbons and other GHG Emissions
	Break (15 mins)	
(3)	<u>Discussion (continues)</u> : Discussion on the action plans of the participating countries created with individual coaching between the sessions and on the details of the plan for year 2022 30 mins (10 mins x 3 countries) + 20 mins (Q&As)	- Representatives of participating countries - Facilitator: Mr. Toshihiko KASAI, President of Institute for Global Reduction of Fluorocarbons and other GHG Emissions
(4)	Summary of the training 20 mins	- OECC