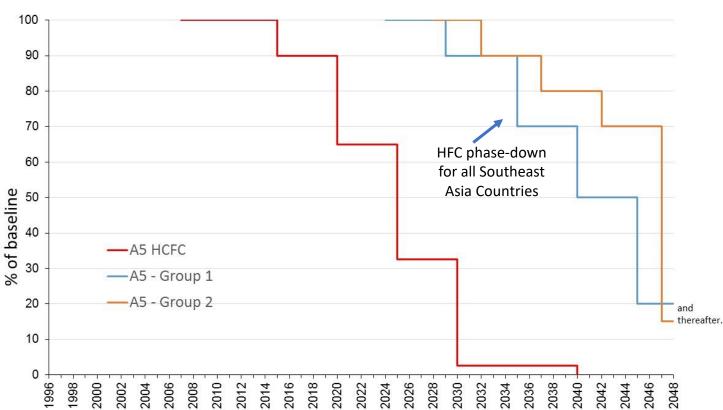




# Welcome Remarks

### The Montreal Protocol on Substances that Deplete the Ozone Layer

### **Consumption = Import – Export + Production**



A5 HFC phase-down schedules and HCFC phase-out schedule

#### **Montreal Protocol**

- Established on 16 September 1987 in Montreal Canada to phase-out consumption of controlled substances including CFCs (completed) and HCFCs (on-going).
- Recently to phase-down consumption of HFCs under the Kigali Amendment.

### Other key obligations

- Article 4B Licensing System: Establish and implement a system for licensing the import and export of new, used, recycled and reclaimed controlled substances
- Article 7 Data Reporting: Data on production, imports and exports of each of the controlled substances on annual basis

## HFCs/blends controlled under the Kigali Amendment

Group I		100-year Global Warming Potential
CHF <sub>2</sub> CHF <sub>2</sub>	HFC-134	1,100
CH <sub>2</sub> FCF <sub>3</sub>	HFC-134a	1,430
CH <sub>2</sub> FCHF <sub>2</sub>	HFC-143	353
CHF <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub>	HFC-245fa	1,030
CF <sub>3</sub> CH <sub>2</sub> CF <sub>2</sub> CH <sub>3</sub>	HFC-365mfc	794
CF <sub>3</sub> CHFCF <sub>3</sub>	HFC-227ea	3,220
CH <sub>2</sub> FCF <sub>2</sub> CF <sub>3</sub>	HFC-236cb	1,340
CHF <sub>2</sub> CHFCF <sub>3</sub>	HFC-236ea	1,370
CF <sub>3</sub> CH <sub>2</sub> CF <sub>3</sub>	HFC-236fa	9,810
CH <sub>2</sub> FCF <sub>2</sub> CHF <sub>2</sub>	HFC-245ca	693
CF <sub>3</sub> CHFCHFCF <sub>2</sub> CF <sub>3</sub>	HFC-43-10mee	1,640
CH <sub>2</sub> F <sub>2</sub>	HFC-32	675
CHF <sub>2</sub> CF <sub>3</sub>	HFC-125	3,500
CH <sub>3</sub> CF <sub>3</sub>	HFC-143a	4,470
CH <sub>3</sub> F	HFC-41	92
CH <sub>2</sub> FCH <sub>2</sub> F	HFC-152	53
CH <sub>3</sub> CHF <sub>2</sub>	HFC-152a	124
Group II		100-year Global Warming Potential
[CHF3	HFC-23	14,800]"

R-410A



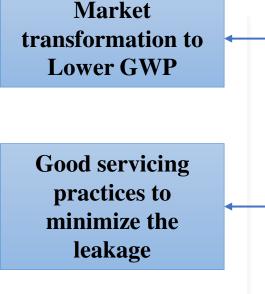


# Linkage between energy efficiency and HCFC Phase-out/HFC Phase-down

### The Montreal Protocol on Substances that Deplete the Ozone Layer VS Refrigeration and Air-conditioning (RAC) Equipment



- HCFC/HFC contained in imported refrigeration and air-conditioning equipment is not counted as consumption under the Montreal Protocol
- However, actions on refrigeration and air-conditioning (RAC) equipment has played an important role to the success and sustainability of the Montreal Protocol
  - Prevent new demand of HCFCs/HFCs for installation/ servicing
  - Reduce demand of HCFCs/ HFCs to service existing RAC equipment
- More perspectives under the Kigali Amendment
  - Safety in handling lower GWP refrigerant
  - Energy efficiency



## **Emissions from Cooling**

Direct Emissions

**Refrigerant Leakage and Foaming Agent** 



Indirect Emissions

CO2 Emitted from Fossil Fuel-based Electricity



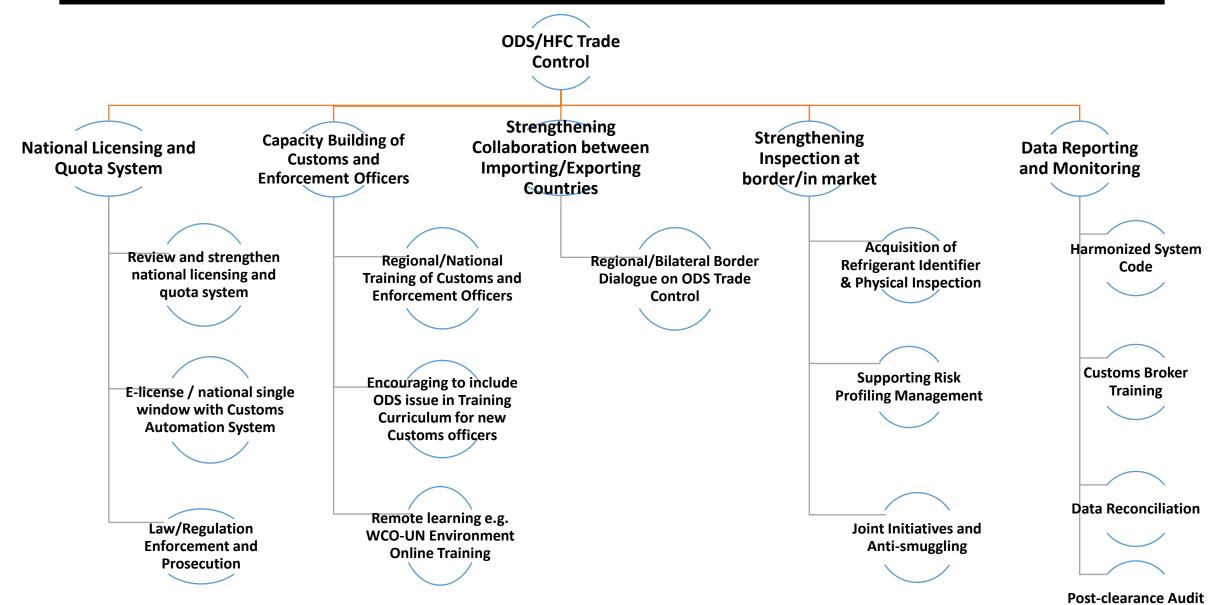
J4E equipment in lo

Energy efficient operations of the RAC equipment would result in lower indirect emissions from energy generation.

Twinning Workshop on Energy-Efficient and Climate-Friendly Refrigeration and Air Conditioning • Bangkok, Thalland • 1-2 October 2018

Actions to maintain and/or enhance energy efficiency while phasing out HCFC / phasing down HFCs

### **Integrated Approach for ODS/HFC Trade Control**



 $\checkmark$ 

Confiscated HCFC-based products that are banned by regulations

Tonga Customs confiscated 110 units of R-22 air conditioning in March 2016





## **RAC Sector Intervention**

Policy and Legislation Framework e.g. banning import of HCFC-based equipment, mandatory certification of RAC technician etc.

in TA and Conversion of manufacturer of RAC appliance Awareness and outreach to RAC technicians Training of RAC servicing technicians Competency Certification of RAC servicing technicians Provision of equipment for training centers and servicing workshop

Intervention in RAC Sector