

Eurovent Summit
Dubai, 13 Sept. 2022



HVACR Contribution to Global Agenda & Role of RAC Association

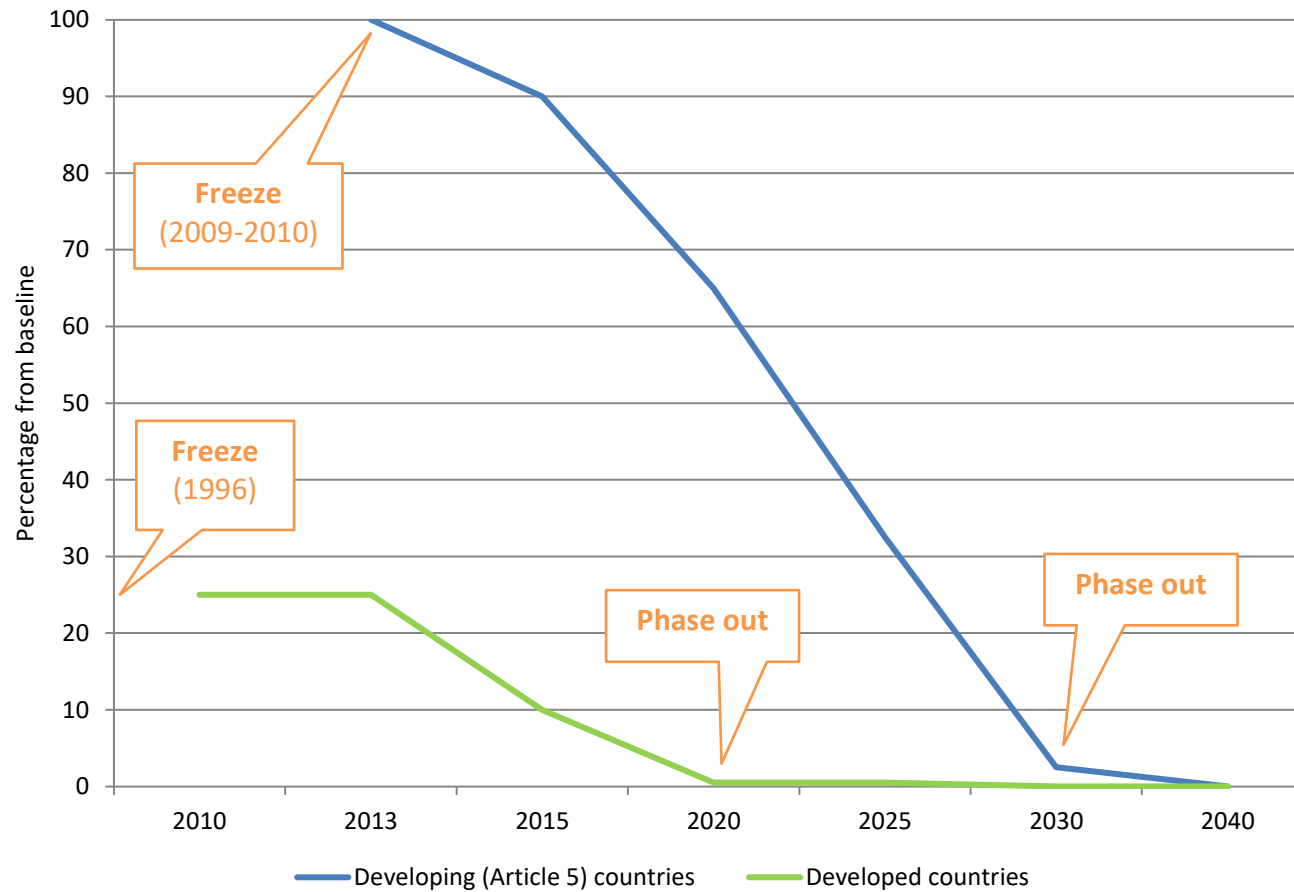
The Montreal Protocol Context

The Montreal Protocol is the landmark multilateral environmental agreement that regulates the production and consumption of nearly 100 man-made chemicals referred to as ozone-depleting substances (ODS).

Adopted on 16 September 1987, the Protocol is to date the only UN treaty ever that has been ratified by every country on Earth - all 198 UN Member States.

The Protocol includes provisions related to Control Measures (Article 2), Calculation of control levels (Article 3), Control of trade with non-Parties (Article 4), Special situation of developing countries (Article 5), Reporting of data (Article 7), Non-compliance (Article 8), Technical assistance (Article 10), as well as other topics.

HCFC Phase-out



Montreal Protocol – A tool to protect ozone & climate



Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer

Twelfth edition (2018)

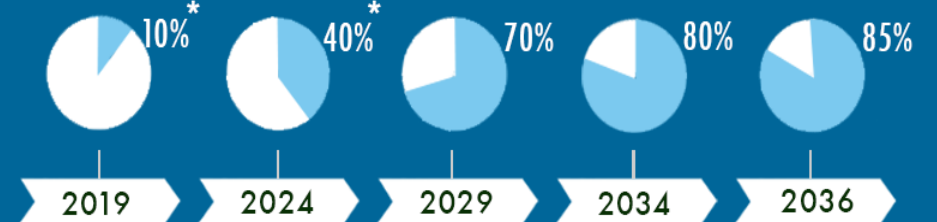


HFC control measures as per the 2016 Kigali Amendment

Non-Article 5 parties

Baseline formula

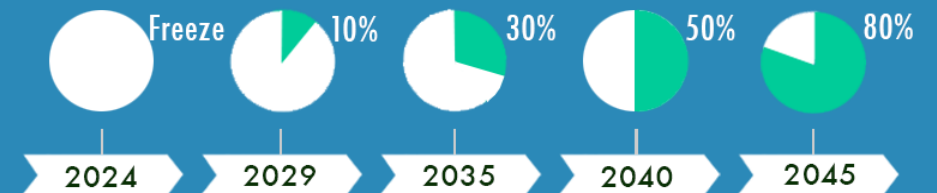
Average HFC consumption for
2011-2013 + 15% of HCFC
baseline*



A5 parties – “Group 1”

Baseline formula

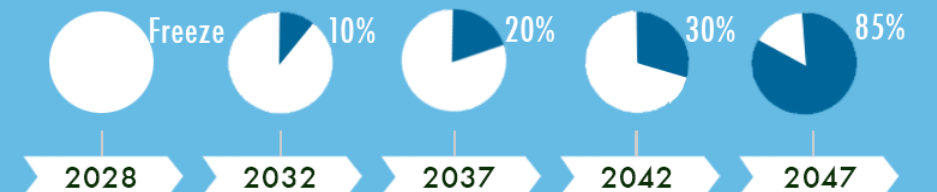
Average HFC consumption for
2020-2022 + 65% of hydrochloro-
rofluorocarbon (HCFC) baseline



A5 parties – “Group 2”

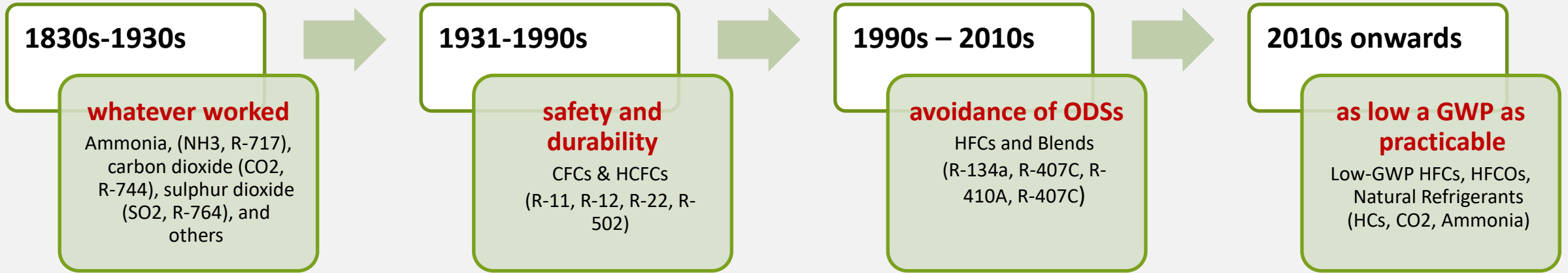
Baseline formula

Average HFC consumption for
2024-2026 + 65% of HCFC
baseline





Refrigerant Transition & Selection



Refrigerant Selection Criteria

1- Climate impact	6- Commercial availability
2- Ozone Depletion	7- High ambient temperature fitness
3- Energy efficiency	8- Safety risk
4- Thermal energy storage	9- Supporting Standards/Codes due to Flammability
5- Cost of Refrigerant/Components	10- Technological level



MIND THE GAP

- **World still heading for a temperature rise in excess of 3°C this century – far beyond Paris Agreement goals of “well below 2°C”**
- **Government pledges (Nationally Determined Contributions) still woefully inadequate**
- **Levels of ambition in Paris Agreement must be X3 for 2°C pathway & increased at least X5 for 1.5°C pathway**
- **Growing number of countries committing to Net-Zero Emissions goals by midcentury is the most significant climate policy development of 2020**
- **These commitments must be urgently translated into strong near-term policies & action**
- **Cooling started to be included in Climate COP themes starting with COP-26**



AGENDA 2030



MONTREAL PROTOCOL

CONTRIBUTION TO THE



HUMAN HEALTH IS PROTECTED	ECOSYSTEMS ARE PROTECTED		CLIMATE IS PROTECTED
3 GOOD HEALTH AND WELL-BEING	14 LIFE BELOW WATER	15 LIFE ON LAND	13 CLIMATE ACTION

ECONOMIC COMPETITIVENESS IS MAINTAINED OR ENHANCED				SUSTAINABLE TECHNOLOGIES AND PRACTICES ARE ADOPTED	FOOD SECURITY IS IMPROVED AND FOOD LOSS REDUCED	MORE WOMEN ENTER WORKFORCE	MONTREAL PROTOCOL OBJECTIVES ARE ACHIEVED THROUGH PARTNERSHIPS
1 NO POVERTY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	2 ZERO HUNGER	5 GENDER EQUALITY	17 PARTNERSHIPS FOR THE GOALS

HVACR & Sustainable Development Goals



Welfare & Quality of Life

(2) Food Security (3) Health (4) Education (8) Economic Growth (11) Sustainable Cities (12) Sustainable Production & Consumption

Technology Selection

(2) Food Security, (3) Health (7) Renewable (9) Innovation (11) Sustainable Cities (12) Sustainable Production & Consumption (13) Climate Action

Education & Employment

(4) Quality Education (8) Good Jobs & Economic Growth, and Innovation



Noted **Not recognized**

Facts and Issues



The Building Sector Growth

The **equivalent of Paris** is added
in floor space every **5 days!**

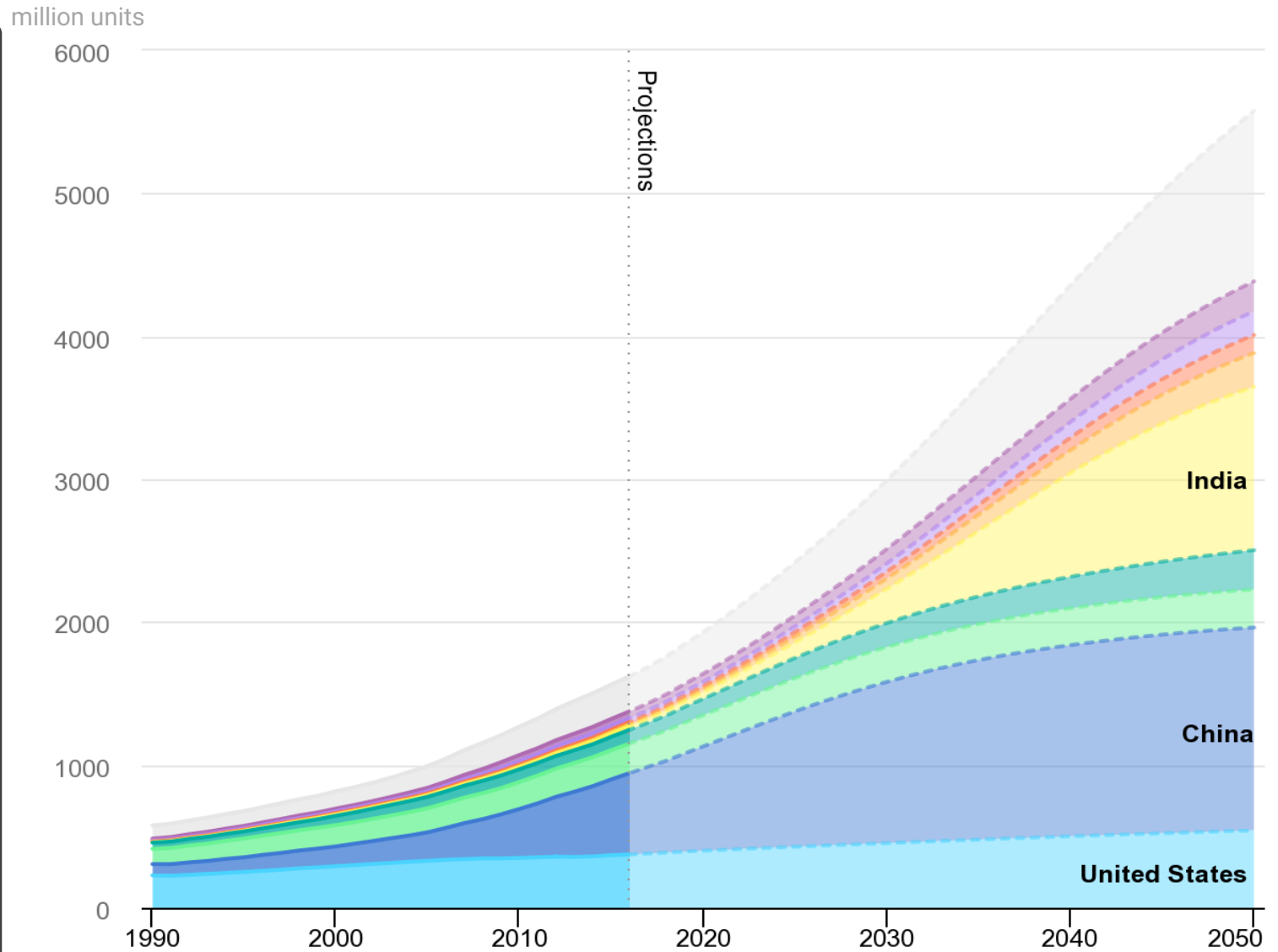
Half of the buildings standing in
2060 have not yet been built!



*The buildings sector offers the **most cost-effective mitigation** potential of any industrial sector and co-benefits **including job creation**, improved indoor and outdoor air quality, improved climate resilience and adaptive capacity*

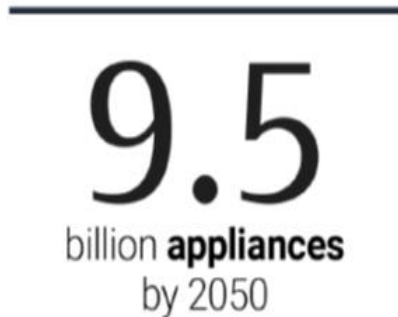
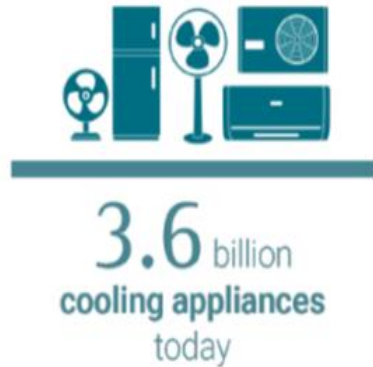
Population Growth & Energy Bill

- Cooling is the fastest growing use of energy in buildings
- Cooling will drive peak electricity demand, especially in hot countries
- Most homes in hot countries have not yet purchased their first AC
- Investing in more efficient ACs could cut future energy demand in half



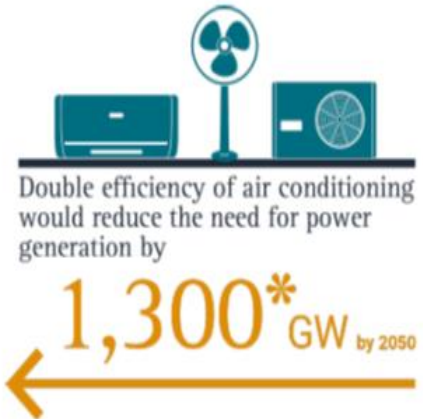
Global air conditioner stock, 1990-2050

Potential GHGs Reductions



If left unchecked, emissions from cooling are expected to double by 2030 and triple by 2100 driven by heat waves, population growth, urbanization, a growing middle class.

By combining energy efficiency improvements with the transition away from super-polluting refrigerants, the world could avoid cumulative GHG emissions equal to 4-8 years of total annual GHG emissions at 2018 levels.





FOOD LOSS AND WASTE FACTS

every year around the globe

1.3 BILLION TONNES OF



is

lost or wasted

that is

1/3 OF ALL FOOD PRODUCED FOR HUMAN CONSUMPTION

Global Loss and Food Waste, FAO

Global quantitative food losses and waste for each commodity group per year:

30%



CEREALS

In industrialized countries, consumers throw away 286 million tonnes of cereal products.

20%



DAIRY PRODUCTS

In Europe alone, 29 million tonnes of dairy products are lost or wasted every year.

35%



FISH AND SEAFOOD

8% of fish caught globally is thrown back into the sea. In most cases they are dead, dying or badly damaged.

45%



FRUITS AND VEGETABLES

Almost half of all the fruits and vegetables produced are wasted.

20%



MEAT

Of the 263 million tonnes of meat produced globally, over 20% is lost or wasted.

20%



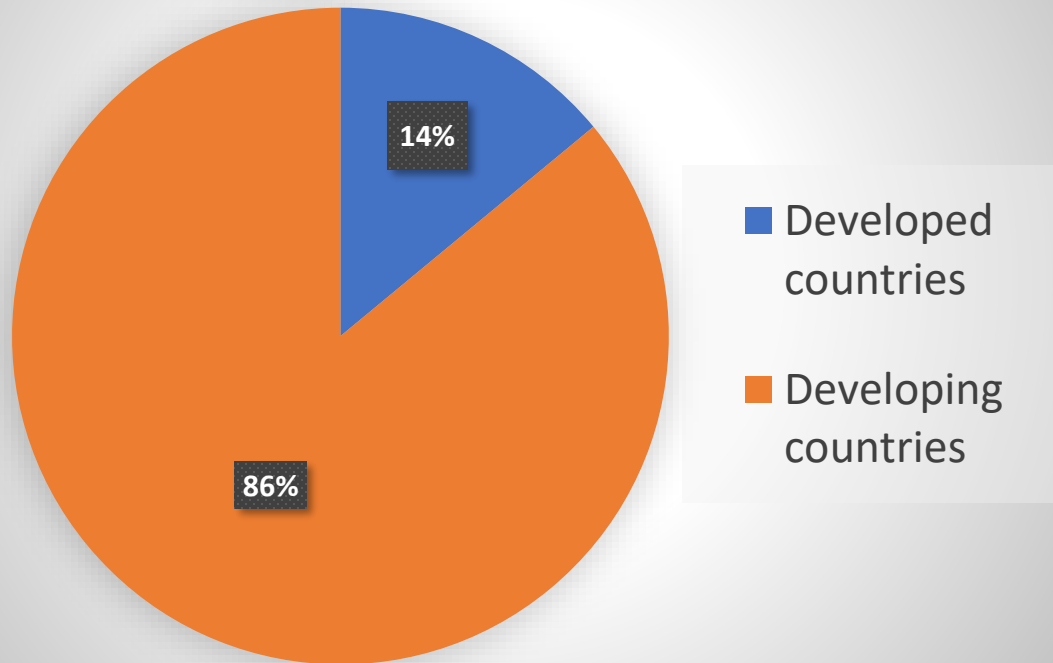
OILSEEDS AND PULSES

Every year, 22% of the global production of oilseeds and pulses is lost or wasted.

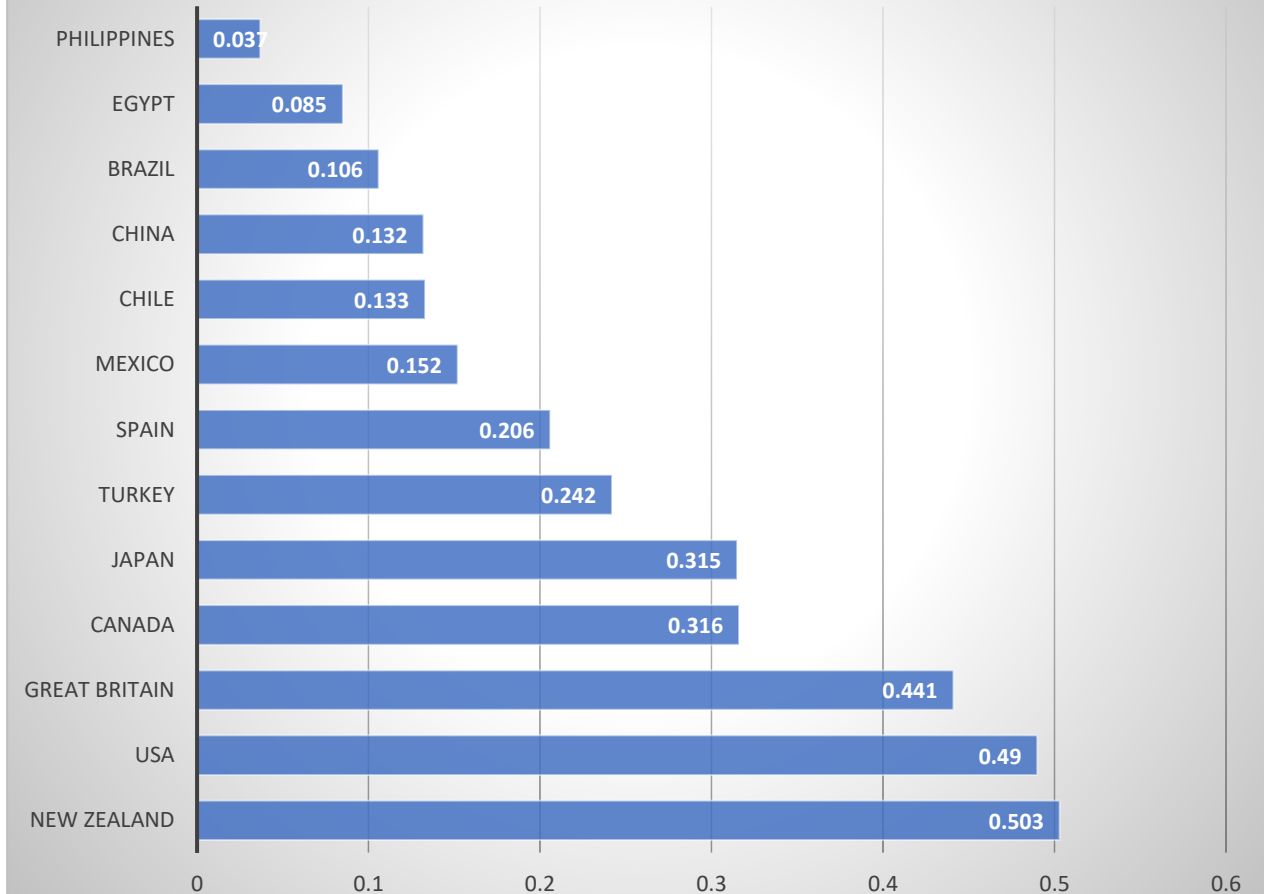
Cold Chain Contribution to Food Loss

GCCA estimations

DISTRIBUTION OF LOSSES DUE TO LACK OF REFRIGERATION IN THE WORLD IN 2013



Refrigerated warehouse capacity in m³ per urban resident (2018)

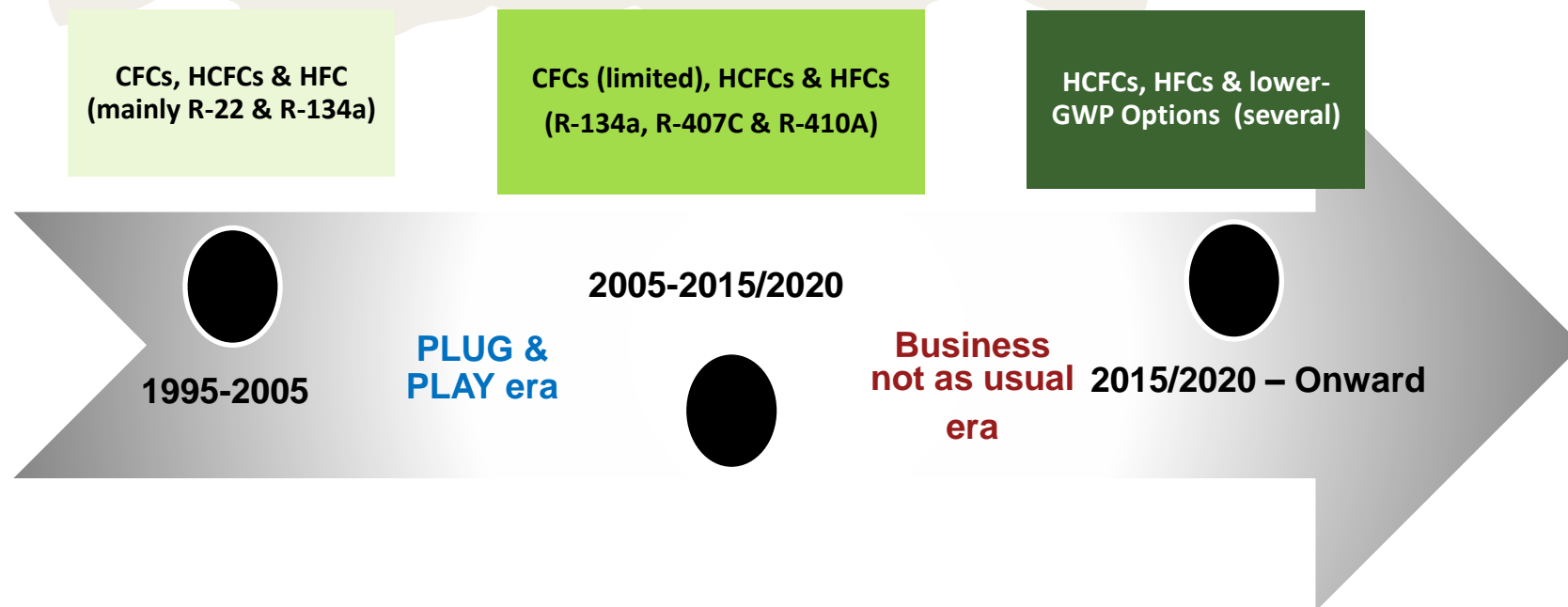




IMPACT ON THE SERVICING SECTOR

Refrigerants - Market

Country	Sub-sector	Lifetime (year)
Developed (non-Article 5 countries)	Domestic refrigeration	15
	Industrial refrigeration	15-30
	Transport refrigeration	9-30
	Commercial refrigeration	15
	Stationary AC	10-25
	Mobile AC	15-16
Developing (Article 5 countries)	Domestic refrigeration	20
	Industrial refrigeration	15-30
	Transport refrigeration	9-30
	Commercial refrigeration	20
	Stationary AC	10-25
	Mobile AC	15-20



Business not as usual

Between 2020 – 2040 many markets in developing countries will have units that operate with HCFC-22, HFC-410A, HFC-32, HC-290 and other HFOs

Role of RAC Associations

The most important local strategic partners have proven to be the RAC technician's associations and technical RAC training schools which have played relevant roles in the identification, contacting, training, certification and awareness-raising of RAC technicians and other sector players

Certification Programs

The training of refrigeration and air-conditioning (RAC) technicians has had the highest impact across all countries (if only because of the important) high percentage of agents of change (trained and certified RAC technicians) reaching up to 90 per cent in some countries

Safety Considerations

Training on the safe handling of flammable and toxic refrigerants relies on strict codes and regulations which must be reflected in training curricula. The absence of trained and qualified technicians in handling flammable and toxic refrigerants and the lack of the respective codes and regulations are considered a barrier by suppliers of new low-GWP and energy efficient technologies

Drop-in refrigerants, retrofitting and conversion

Retrofitting HCFC-based equipment with flammable alternatives might be common practice in some countries. HCs are not recommended in systems that are not designed to use the flammable refrigerant. Awareness to technicians and end-users about the risks associated with such practices is highly needed.

Access to Technology

The main barriers identified for the adoption of lower-GWP alternative technologies to HCFCs are: (a) the higher costs involved; (b) lack of confidence in the new technology; (c) lack of local expertise; and (d) unavailability of equipment and servicing tools in the local market

Informal Servicing Sector

The training of the informal RAC servicing sector presents challenges of its own, which are made more difficult by the fact that the informal RAC servicing sector is usually bigger than the formal one in many countries.

Role of RAC Associations

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Refrigerant Containment

There are many challenges facing the efficient and cost-effective reclamation schemes such as (a) quality and conformity of reclaimed refrigerants; (b) Logistic costs; (c) labour costs (recovery is time consuming); (d) Price of reclaimed refrigerants vis-à-vis virgin; (e) the lack of local availability of ancillary equipment and parts; and (f) absence of destruction facilities to handle un-wanted quantities.

Energy Efficiency

While most countries developed, or developing, MEPS programs for placing equipment in local markets; the attention to EE while servicing is not receiving the adequate attention. There is a need to ensure inclusion of such skills and competencies in the training and certification programs.

Regulatory Frameworks

The capacity and/or tools to develop and enforce specialized regulatory frameworks for managing the servicing sector and controlling practices are limited in many countries and need attention

Sustainability of Training

Training programs, especially those offered by TVET authorities, needs to be connected either to market needs or local enforceable certification scheme. This is in addition to the need to maintain regular updates to catch-up with the technological development



UNEP Partnership With HVACR Associations for Compliance and Sustainability



UNEP COOLING RELATED PROGRAMS



Mission

Enable developing countries to meet and sustain their compliance obligations under the Montreal Protocol



OzonAction strengthens the capacity of governments - particularly the operational focal points known as National Ozone Units - and industry in developing countries to elaborate and enforce policies and make informed decisions about alternative technologies needed to implement this treaty.

Partnerships for achieving Montreal Protocol objectives (examples)

Refrigeration & air conditioning



abrava



ACAIRE



AHRI



AREA



AREMA



ASHRAE



ATF



BFS



CHEAA



EPEE



FAIAR



GFCC



IIR



IOR



ISHRAE



JRAIA



MAC Partners Europe



Refrigerants Australia



REHVA



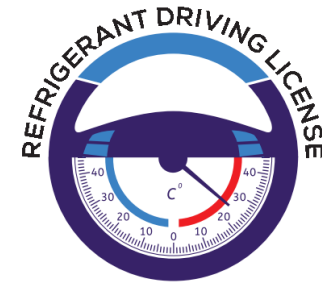
US-ARC



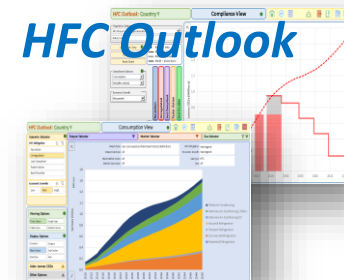
WRD Secretariat



Example Initiatives

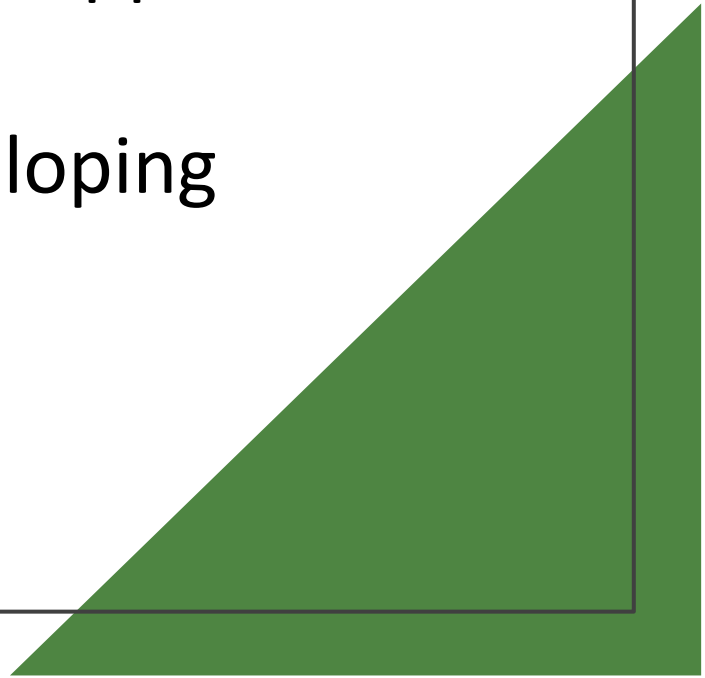


REFRIGERANTS LITERACY



Examples

UNEP OzonAction and
Partners Programs to support
HVACR Industry and
Governments in Developing
Countries

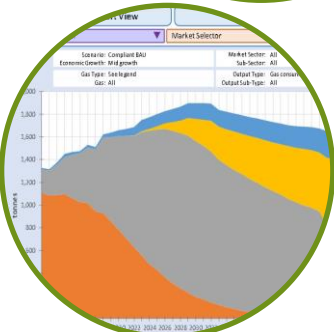


**Partnering
for better
delivery**

Benefiting of EU
F-Gas related
products

Duration Days	Typ	SMALL MEDIUM Domestic/ light Commercial Workshops		Commercial A/C (Large Service Companies and Workshop)		Master Trainers		Master Trainers	
		Technicians	Technicians	Technicians	Technicians	Technicians	Technicians		
1. General Module									
Background	1	T	x	x	x	x	x	x	x
Types	1	T	x	x	x	x	x	x	x
Groups	1	T	x	x	x	x	x	x	x
ment	2	T	x	x	x	x	x	x	x
and Safe	2	T/P	x	x	x	x	x	x	x
ents	1	T	x	x	x	x	x	x	x
		T	x	x	x	x	x	x	x
		x							

Universal Training Kit
on Sound Management of Refrigerants
(In cooperation with AREA)



HFCs Outlook
Scenario Model for A5 countries
(In cooperation with EPEE)



National Certification Program
based on FOGas Certification
(In cooperation with ATF)





Gender Equality in HVACR



INSTITUT INTERNATIONAL DU FROID
INTERNATIONAL INSTITUTE OF REFRIGERATION



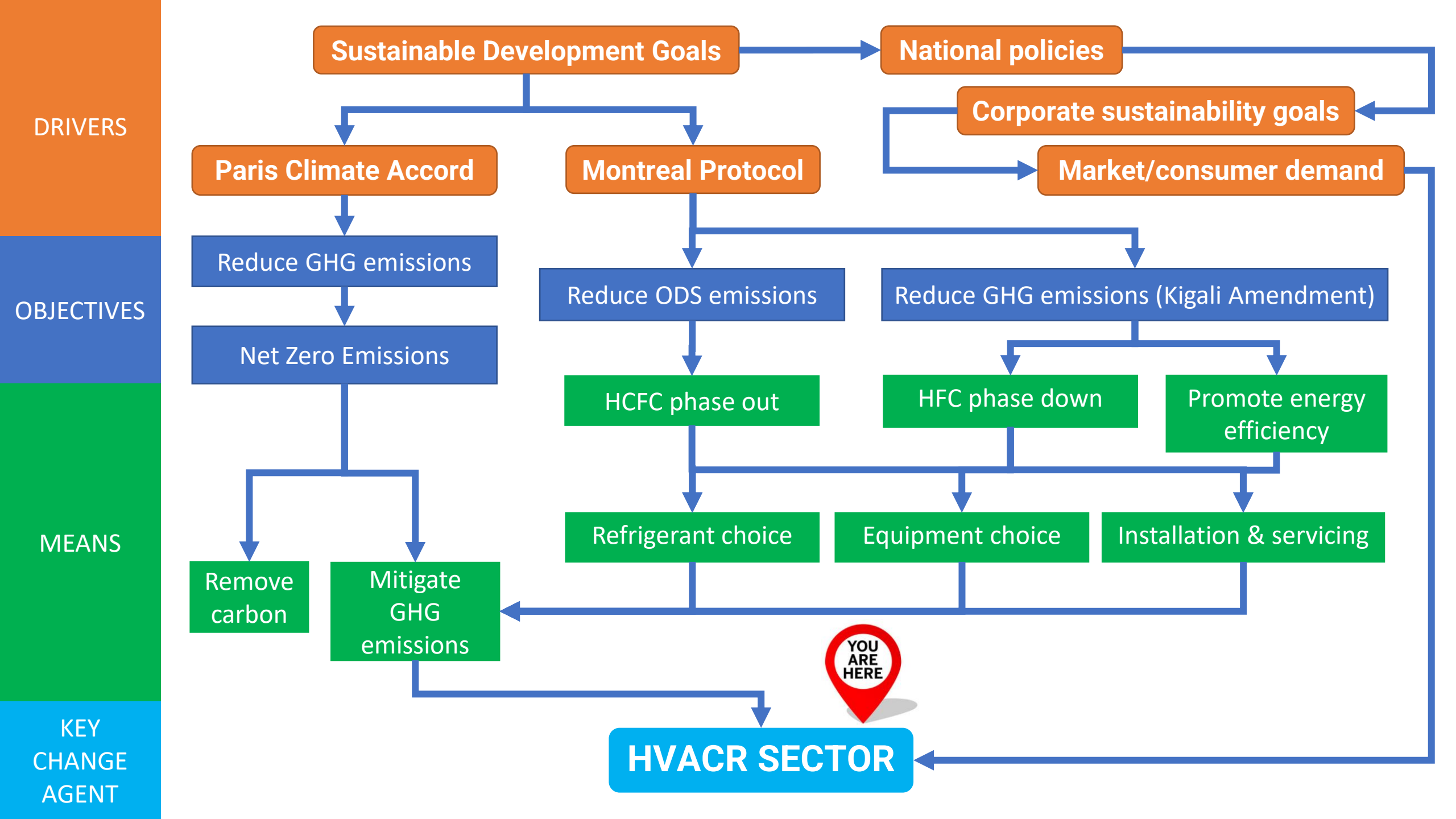
In cooperation with:



Women in Cooling (RACHP) Global Survey



**CONCLUDING
MESSAGES**



Thank you

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UN Environment Programme

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