

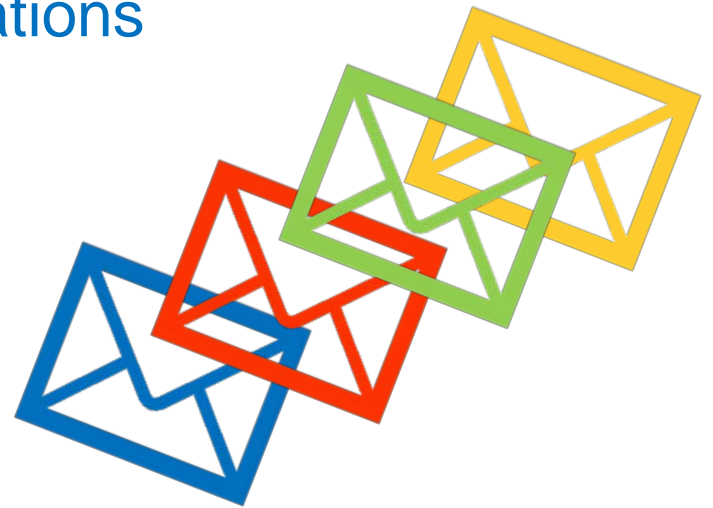
Transition to lower-GWP alternatives in Article 5 countries
In Air-Conditioning Servicing Sector

SUSTAINABLE TECHNOLOGIES FOR AIR CONDITIONING WORKSHOP
MONTREAL, CANADA
Saturday, 18 November 2017



Outline

1. Phase-out & Timeline Considerations
2. Servicing Sector Considerations
3. Interventions and Opportunities
4. What's Needed...



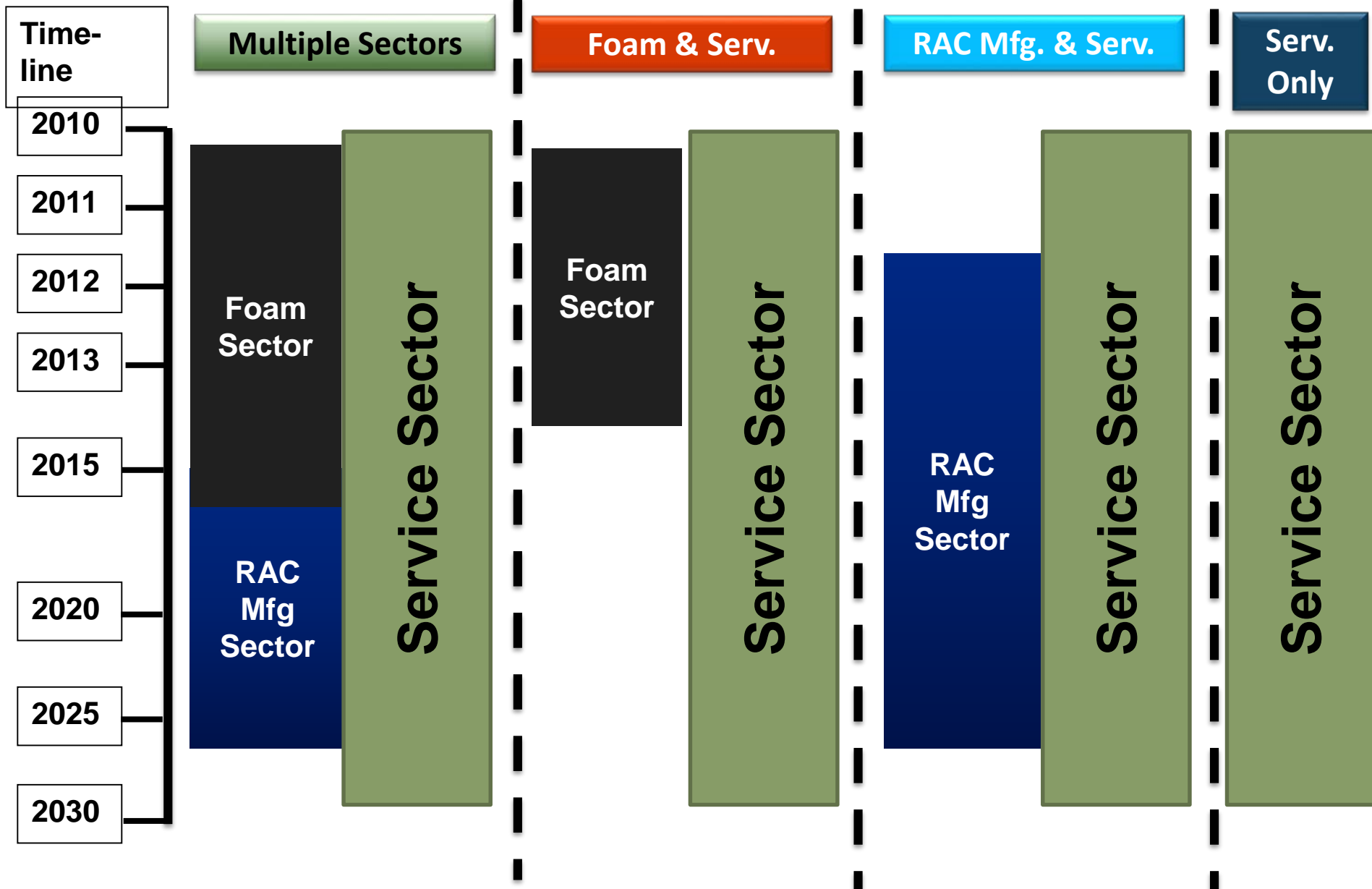


Message # 1

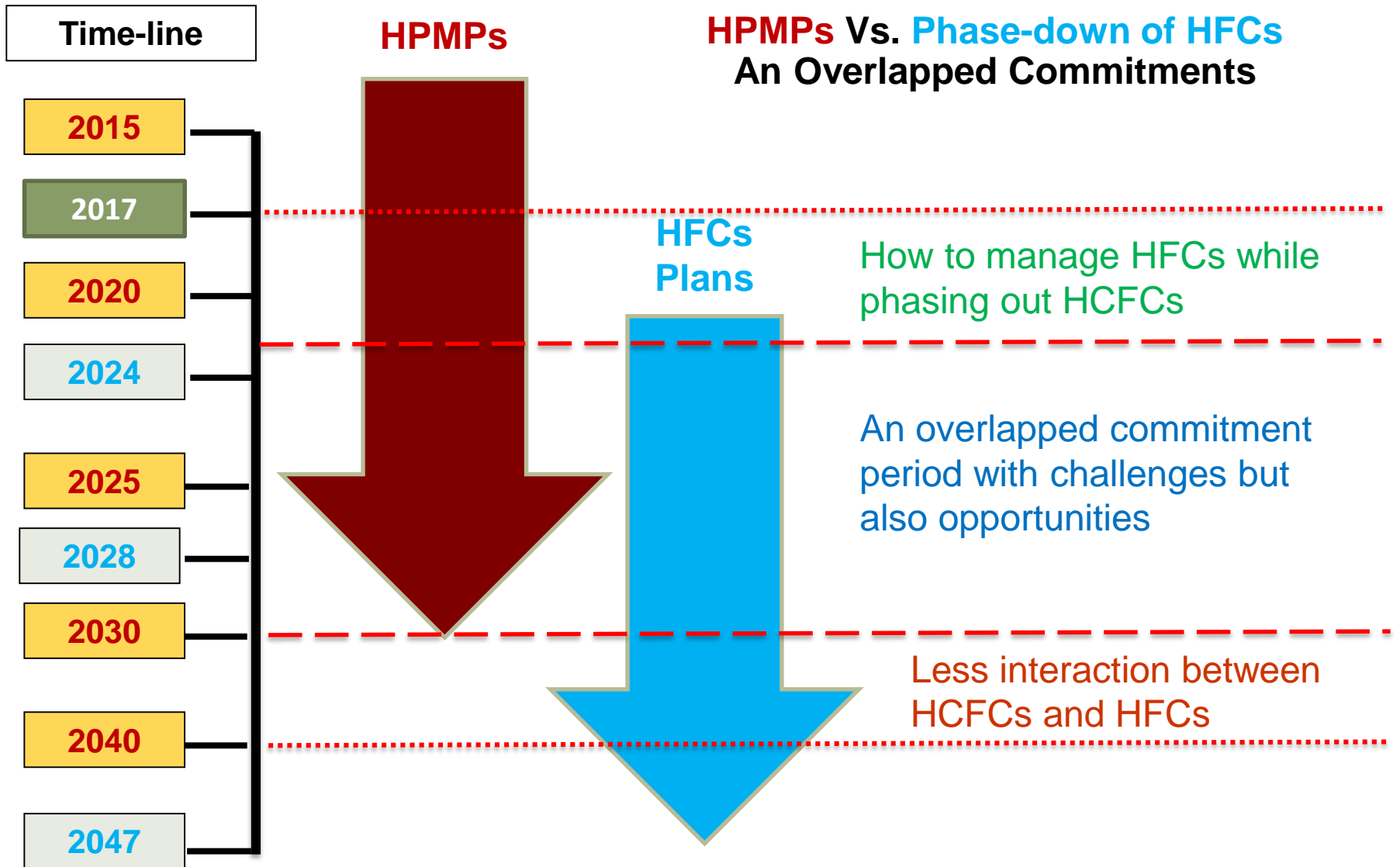
No one solution fits all

Phase-out & Timeline Considerations

Current HCFCs Phase-out Commitments



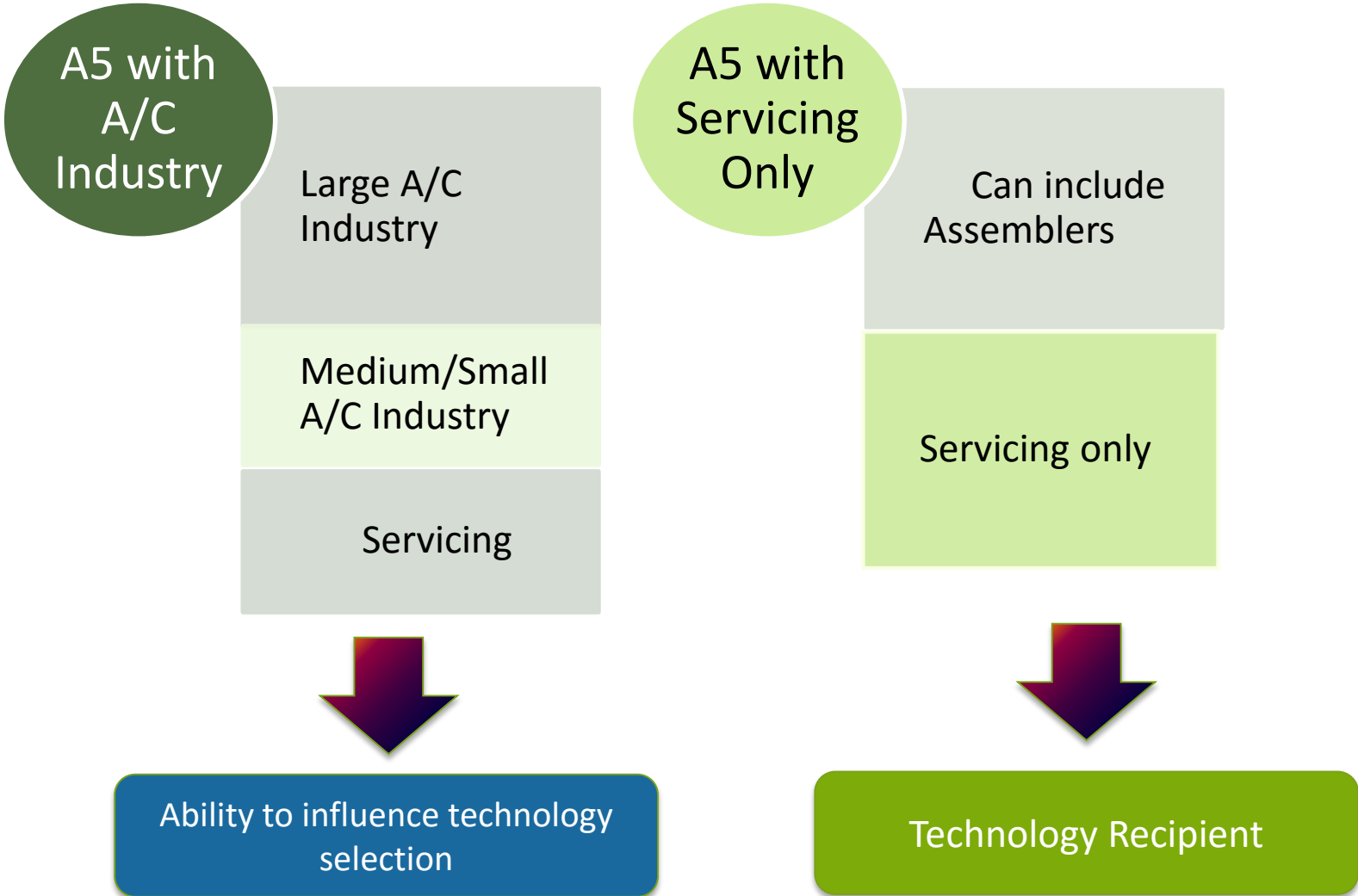
Phase-out & Timeline Considerations



Phase-out & Timeline Considerations

The difference amongst Article 5 countries

Nature of Consumption in A/C sector

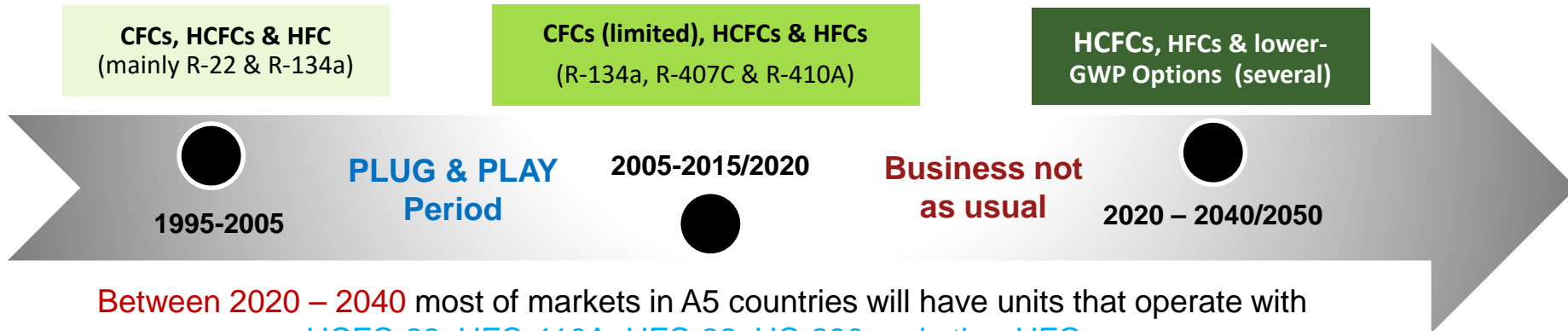




Message # 2

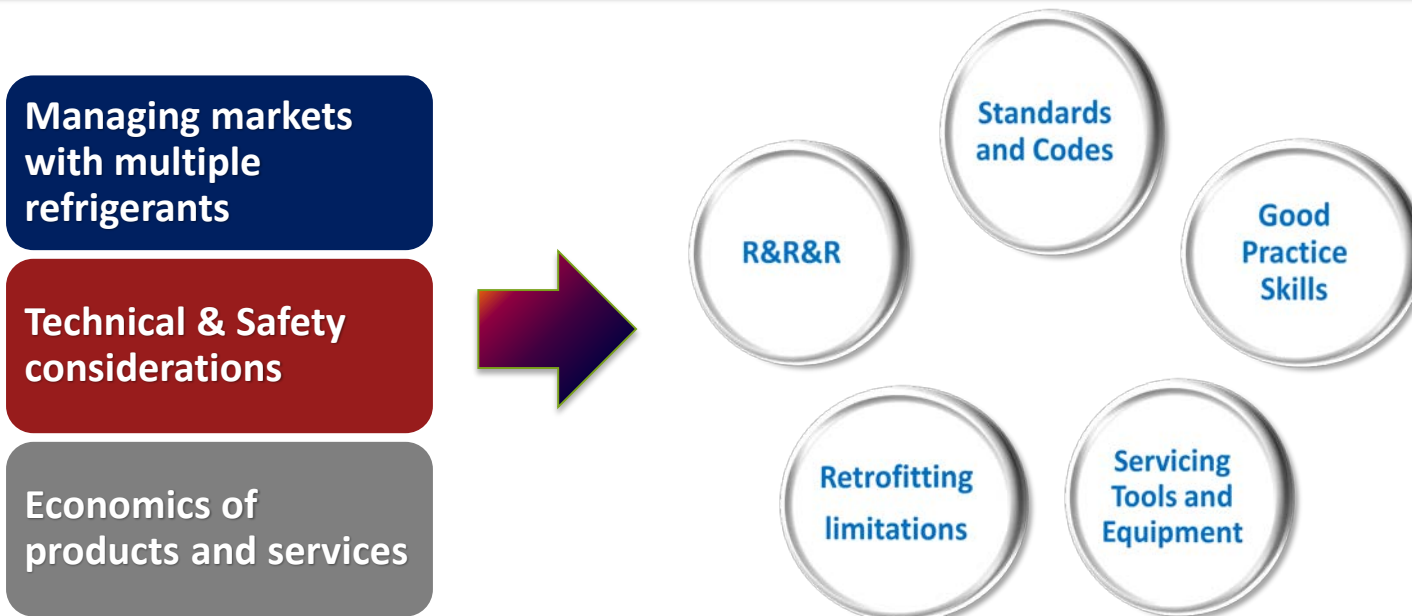
Need to change mindset

Considerations for A/C Servicing Sectors



Between 2020 – 2040 most of markets in A5 countries will have units that operate with HCFC-22, HFC-410A, HFC-32, HC-290 and other HFOs

What do we mean by Business not as usual ?





Message # 3

**With challenges come
opportunities**

Interventions and Opportunities

Interventions through MLF mechanism

Training and Certification

- Develop Code of Practice
- Establish Certification Program
- Training programs on good practice
- Update local technical curricula

Standards Update

- Refrigerants
- Equipment
- Containers

Reclamation Scheme

- Establish Reclamation Centers
- Supply R&R sets and service tools

Technical Assistance

- Demo projects
- - Technical Awareness
- - Global tools; (clearinghouse)

Interventions and Opportunities

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Interventions and Opportunities

Training and Certification

Skills of identifying and handling different types of refrigerants

- Mandatory certification schemes

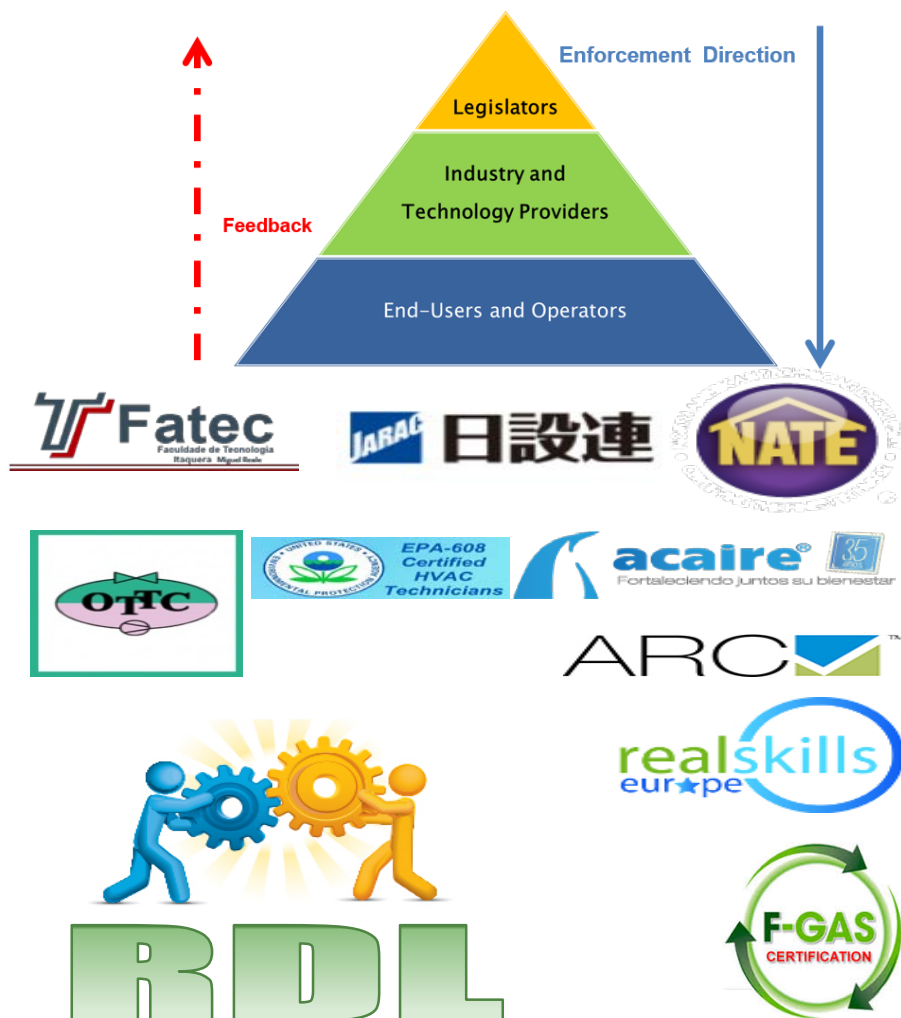
- Development
- Enforcement

Challenges:

- Apparently, typical certification programs for RAC professions are not as effective as designed, or intended, in most of A5 countries.
- Enforcement is also complex issue for all, modalities and technical capacities to enforce and monitor is a big question mark

Opportunities:

- International standard (ISO) is being considered at the moment for setting competencies and skills required benefiting of EN13313
- Building special refrigerant certification program for example to F-gas certificate
- Industry initiatives i.e. RDL



Interventions and Opportunities













Servicing Tools and Equipment

Challenges:

- Different than existing in terms of being designed for different refrigerants
- More cautions arrangements towards leakage, flammability, brazing, charging, etc. practices

Opportunities:

- A lot of similarities in the practice techniques
- Less time for some cases especially when using zero/very low GWP refrigerants like HCs in small applications. (venting instead of recovery)
- Increased number of resources; materials, manuals and guidelines started to be available

Tool	R32	R410A	R22
Gauge manifold 	Slightly different scale for HFC32 and R410A so check with tool supplier if manifold is shareable		
Charge hose 	Common		
Scale 	Common		
Pipe bender 	Common		
Pipe cutter 	Common		
Flaring tool 	Common		R22 type can be used by changing the work process
Torque wrench 	Common		Some flare nut widths are different, others can be shared
Cylinder thread adaptor 	Depends on the cylinder – some have different thread for flammable gases	Not applicable	
Vacuum pump 	Common		
Recovery pump 	Check with tool supplier if shareable		
Electr. Leak detector Torch type models CANNOT be used 	Check with tool supplier if shareable		
Refrigerant recovery cylinder 			

Interventions and Opportunities

Examples of additional possible Interventions

Training and Certification

- Develop Code of Practice - Establish Certification Program
- Training programs on good practice - Update local technical curricula
- **Regulatory framework for certification including enforcement and monitoring tools**

Standards Update

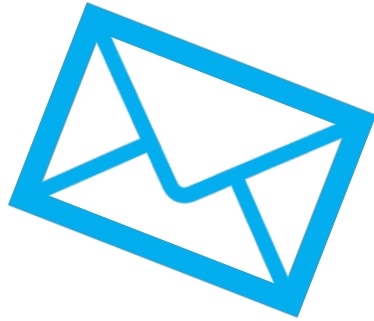
- Refrigerants, Equipment, Containers
- **Refrigeration and Air-conditioning Codes**
- **Buildings Codes**
- **Relation to MEPS and EE programs**

Reclamation Scheme

- Establish Reclamation Centers - Supply R&R sets and service tools
- **Registering refrigerants traders and distributors**
- **Ban use of non-refillable cylinders**
- **Testing facilities**

Technical Assistance

- Demo projects
- Technical Awareness
- Global tools; (clearinghouse)
- **Support to and empowering local associations**
- **Programs for Cold Chain sectors**



Message # 4

Doing it differently

What's Needed....

Doing it differently

Three Key Words

- **Outsourcing**
- **Accessible to All**
- **Sustainability**

Example: Reclamation Schemes

- **Outsourcing**
 - Reclamation Centers to be awarded through competitive bidding to private sector only
 - Monitoring of operation and logs can be through local associations
- **Accessible to All**
 - Tools and incentives to engage end users
 - Training tools to different groups
- **Sustainability**
 - Testing facilities to ensure credibility of reclaimed refrigerants
 - Registration, logging and monitoring system



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Thank you