F-GAS AND ECODESIGN:

INFLUENCES OF EU LEGISLATION ON ITALIAN INDUSTRY

EPEE
European Partnership for Energy and the Environment

CONFINDUSTRIA PADOVA

CAREL

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09.00 – 18.00

Hotel NH Laguna Palace

Mestre (VE)

F-Gas And Ecodesign: Influences Of EU Legislation On Italian Industry

Focus on Lot 1

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Director Governmental Affairs
Emerson Climate Technologies Europe
Mestre, 9th of May 2016

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Agenda

- Ecodesign regulations HVACR
- Ecodesign regulations – market influence and requirements
  - ENTR lot 1 - professional refrigerated storage cabinets, blast cabinets, condensing units & process chillers
- Ecodesign and F-gas regulation
- F-Gas regulation and its ripple effect
- Manufacturers‘ challenges – qualification, design, testing, manufacturing
- Industry response to legislative changes

EU HVACR Ecodesign Regulations
Direct Impact – Legal Document # - Limited Application

- ENER Lot 1 (EU) No 813/2013 Space & Combination Heaters
- ENER Lot 2 (EU) No 813/2013 Water Heaters & Hot Water Storage Tanks
- ENER Lot 10 (EU) No 206/2012 Air Conditioners & Comfort Fans
- ENER Lot 11 (EU) No 327/2011 Fans Driven By Motors – Review
- ENER Lot 11 (EC) No 640/2009 Electric Motors (Not For Compressors) – Under Review
- ENER Lot 12 Refrigerated Commercial Display Cabinets - Consultation Forum (CF) / Impact Assessment (IA)
- ENER Lot 21 Air Heating Products, Cooling Products & High Temp Process Chillers – Scrutiny Period – Coming into Force Summer 2016
- ENER Lot 30 Special Motors (Not For Compressors) & Var. Speed Drives
- ENER Lot 31 Compressors (Not For Refrigeration Purposes)
- ENER Lot 33 Smart Appliances

- ENTR Lot 1 (EU) No 1095/2015 Professional Refrigerated Storage Cabinets, Blast Cabinets, Condensing Units & Process Chillers

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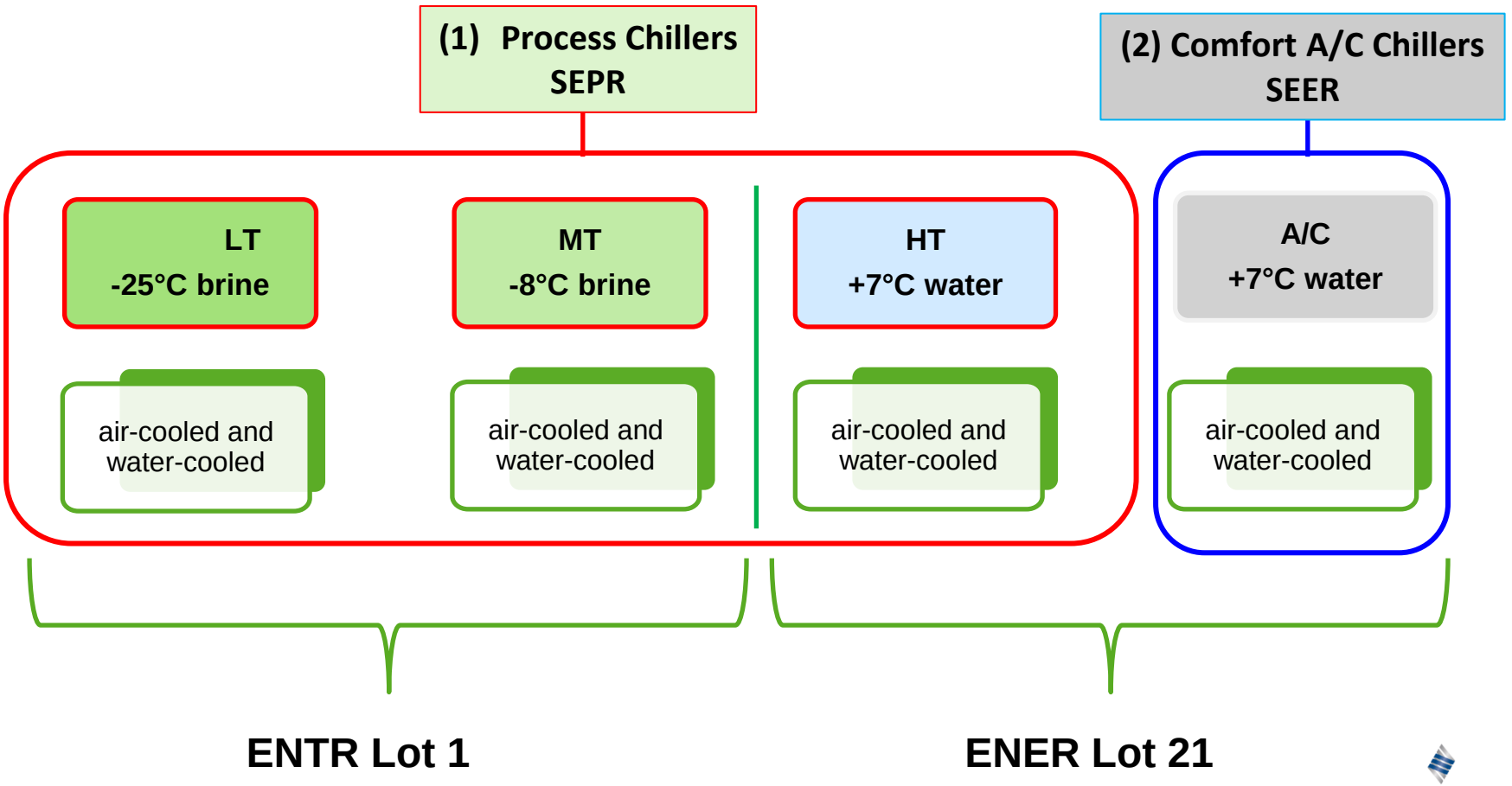
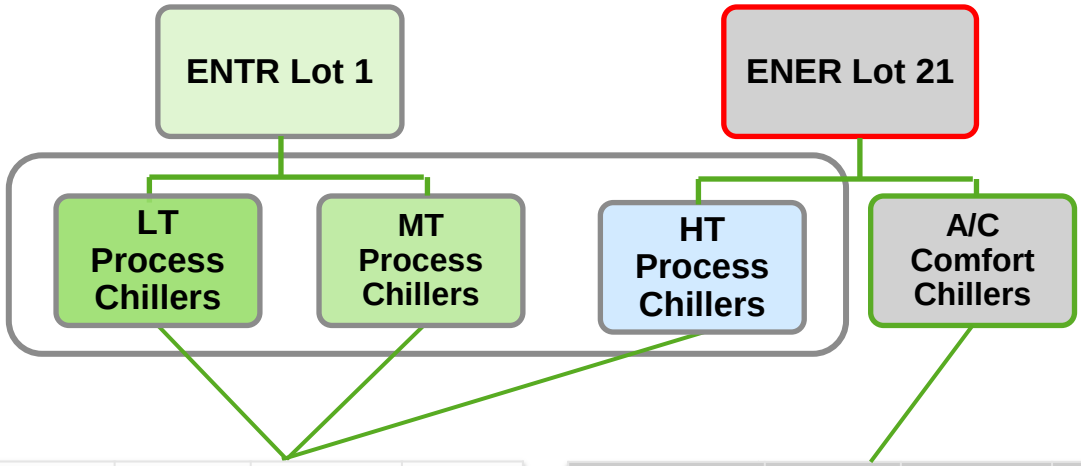
ENTR Lot 1 & ENER Lot 21

Chillers are in both regulations



Chillers
Load and Temperature Profiles



Reference Condition	air-cooled t_{amb} [°C]	water-cooled t_{water} [°C]	load [%]
A	35	30	100
B	25	23	93
C	15	16	87
D	5	9	80

Reference Condition	air-cooled t_{amb} [°C]	water-cooled $t_{water.}$ [°C]	load [%]
A	35	30	100
B	30	26	74
C	25	22	47
D	20	18	21

Process Chillers – SEPR Analysis
Minimum Efficiency Performance Standards (MEPS)

ENTR Lot 1 MT and LT Process Chillers: SEPR

	Cooling Capacity	MEPS Tier-1	MEPS Tier-2
LT air-cooled	< 200 kW ≥ 200 kW	1,48 1,6	1,7 1,84
MT air-cooled	< 300 kW ≥ 300 kW	2,24 2,8	2,58 3,22
LT water-cooled	< 200 kW ≥ 200 kW	1,82 2,1	2,09 2,42
MT water-cooled	< 300 kW ≥ 300 kW	2,86 3,8	3,29 4,37

Additional ENTR Lot 1: Bonus for GWP < 150 -> Tier-1 / Tier-2: 10 %

ENER Lot 21 HT Process Chillers: SEPR

	Cooling Capacity	MEPS Tier-1	MEPS Tier-2
air-cooled	< 400 kW ≥ 400 kW	4,5 5,0	5,0 5,5
water-cooled	< 400 kW ≥ 400 kW ≥ 1500 kW	6,5 7,5 8,0	7,0 8,0 8,5

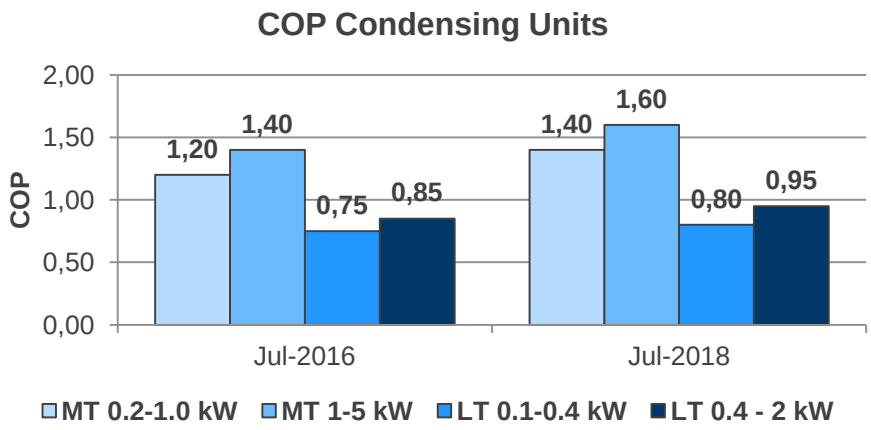
ENTR Lot 1 Condensing Units
Requirements (CE Marking)

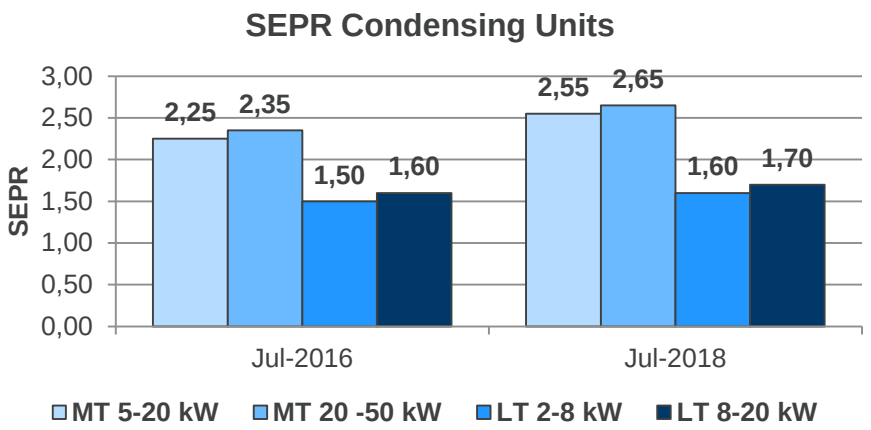
	COP	SEPR
Low Temp (T evap -35°C)	0.1 - 2kW	2 - 20kW
Medium Temp (T evap -10°C)	0.2 - 5kW	5 - 50kW
T amb	32°C	
T amb (D) 5°C		part load
T amb (C) 15°C		part load
T amb (B) 25°C		part load
T amb (A) 32°C		full load
degradation for fixed and staged capacity at part load		0.25
Tier 1	1.7.2016	1.7.2016
Tier 2	1.7.2018	1.7.2018
Bonus for GWP <150 @ Tier 1	15%	15%
Bonus for GWP <150 @ Tier 2	10%	10%
Rating Standard	EN 13215	EN 13215
Testing Standard	EN 13771-2	EN 13771-2
Tolerances for Market Surveillance	10%	10%
Additional Product Information Requirements		

Product Information Requirements:

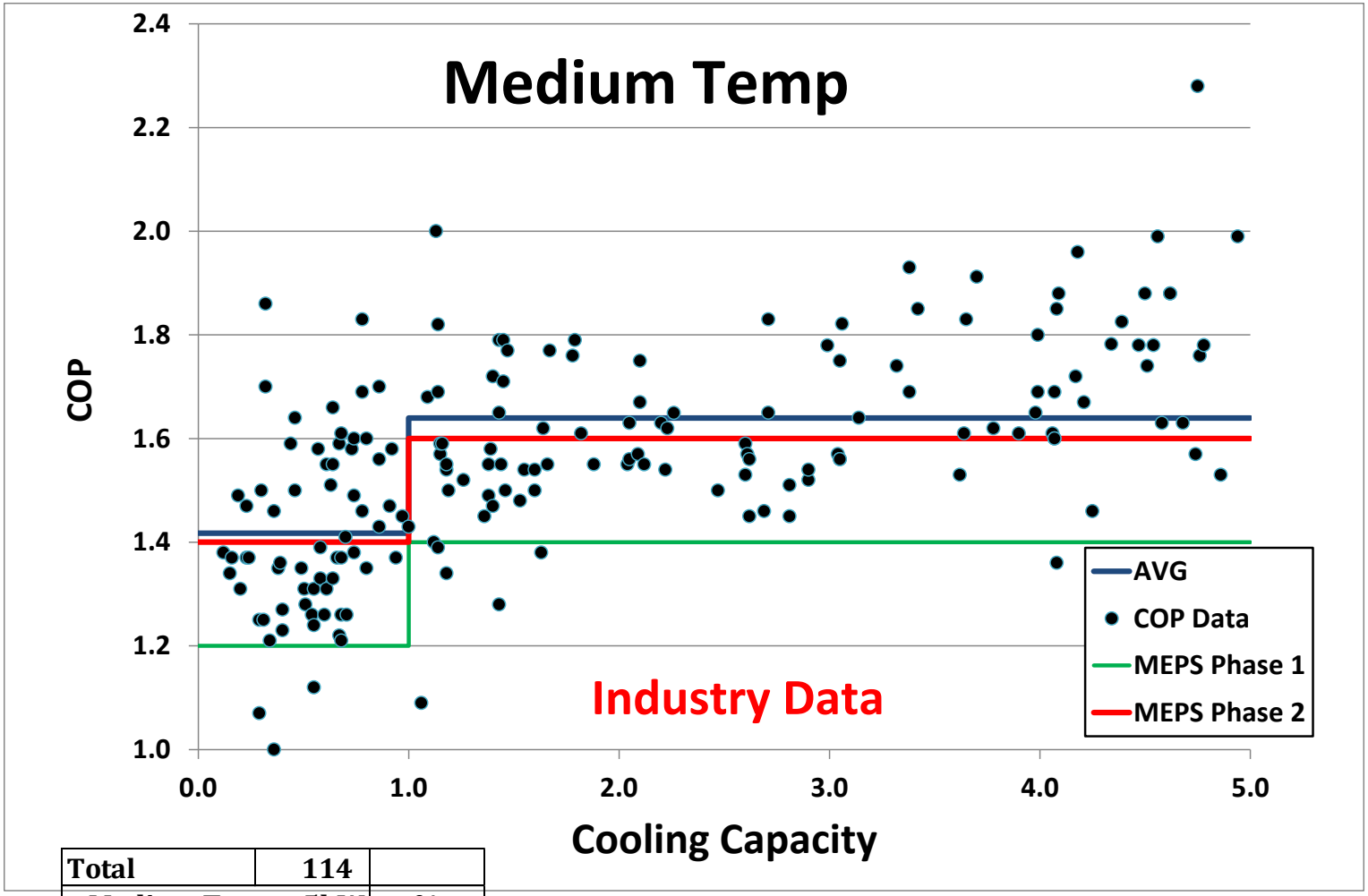
Follow Layout from Legal Text!!

***ASERCOM* Condensing Unit Certification Scheme available**





Market Influence ENTR Lot 1
Condensing Units



Total	114	
Medium Temp <5kW		%
Tier 1: 7/2016	10	9%
Tier 2: 7/2018	46	40%

% of condensing units **phased out** by the 2 tiers, as of today

Ecodesign and F-Gas Regulation

Title of Product Regulation	ErP GWP Rules and F-Gas Bans	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
(EU) No 327/2011: fans driven by motors 125W-500 kW												Under Review							
ENER Lot 30: motors (0,12-1.000kW) and VSDs												Draft Regulation							
(EU) No 206/2012: air conditioners ≤ 12 kW and	GWP 150 Bonus								2500 GWP					750 GWP					
(EU) No 813/2013: space & combination heaters ≤ 400 kW									2500 GWP										
(EU) No 814/2013: water heaters ≤ 400 kW									2500 GWP										
(EU) No 1253/2014: ventilation units																			
(EU) 2015/1095: professional refrigeration products	GWP 150 Bonus								2500 GWP										
ENER Lot 12: commercial refrigeration products	**Hermetically Sealed**								2500 GWP		150 GW	Draft Regulation							
ENER Lot 21: air heating, cooling products, high temp process									2500 GWP			Scrutiny until 1st of May							
F-Gas Regulation	**Multipack centralized**								2500 GWP		150 GW								
Phase Down Plus Pre-charged Imports 12% in 2015/2016				112%	105%	93%	63%	63%	63%	45%	45%	45%	31%	31%	31%	24%	24%	24%	21%
Minus New Entrants Reserve: 11%				89%	83%	83%	56%	56%	56%	40%	40%	40%	28%	28%	28%	21%	21%	21%	19%
Minus Pre-Charged Imports 12% Today, 18% in 2030				89%	83%	72%	49%	48%	48%	34%	34%	33%	23%	23%	23%	17%	17%	17%	15%

F-Gas Regulation Ripple Effect

- F-Gas: Many more flammable refrigerants to consider

  Condensing units will move to lowest GWP options, including A2L (eq. 1,3kg R404A) and even A3 refrigerants (eq. 0,4kg R404A)

- Ecodesign: Phase down forces to consider other refrigerants than during study and impact assessment

- Atex: Changeover of electrical components –> equipment cost

- PED: Class move –> equipment cost

- Standards: update of safety standards for use of flammable refrigerants ongoing –> lengthy process

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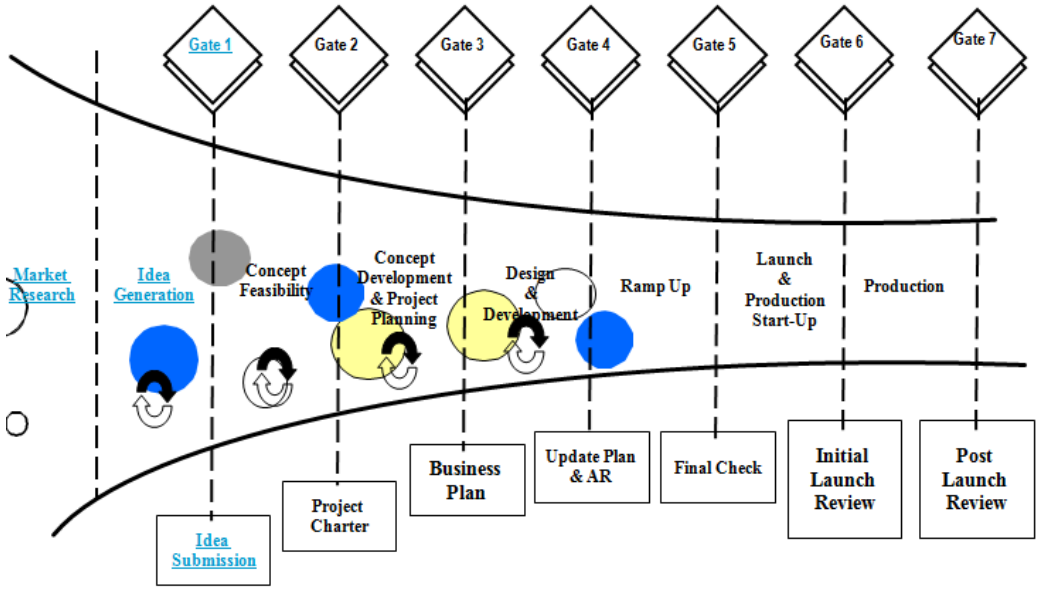
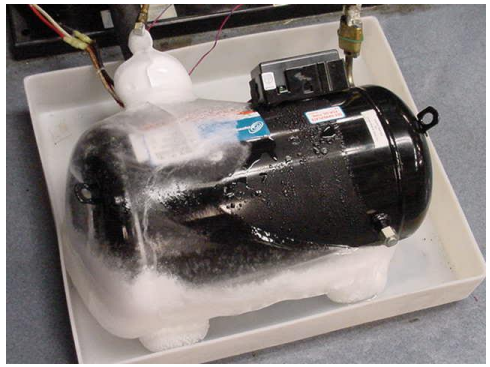
Compressor Qualification
Resource and Time Intense Process



Emerson New Product Development Process



- Full process taking several months to years
- Short-cuts depending on scope of design challenge
- Controlled pre-release for field testing
- > 100 compressors for new product development under accelerated conditions

Phases

- Theoretical assessment
- Reliability & safety pre-assessment
- Performance pre-assessment
- Reliability & safety for final release
- Performance for final release
- **Formal rating including *ASERCOM* certification**

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Response to Legislative Changes

- Align portfolio and documentation to adhere to new rules
- Tackle Rating Standard EN13215 to adjust for impact of glide on condenser performance
- Support and participate in timely flammable refrigerant standards
  - Revision of building codes, at EU and national/regional level
- Support training & education of business partners
- Face and understand the global market situation - complexity and interdependence of regulations worldwide
- Understand and focus on LCCP, not only GWP – indirect and direct emissions
- Learn from Montreal protocol and coordinate industry efforts to have the most efficient phase-down
- National approach in market surveillance is not sufficient for level playing field
  - Support voluntary certification schemes for a more level playing field and for a possible relieve of market surveillance authorities.

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