

RACHP Equipment & PFAS



December, 19 2023

OUR PRODUCTS



Air-Conditioners



Heat Pumps



Refrigeration

From less than 1 kW up to couple hundred kW
With different technologies as “split” types and “self contained” types

WHERE OUR PRODUCTS ARE USED



Home refrigeration

Vaccine storage



Transport refrigeration

Sports facilities



Grocery stores

Offices and schools



Homes

Hospitals



OUR MEMBERS

CORPORATE MEMBERS

A-GAS TOGETHER WE CAN	AGC	ARKEVA
		
	climalife	 DAIKIN CHEMICAL EUROPE
		COPELAND
FUJITSU		HITACHI Inspire the Next
Honeywell		koura
		
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	.AGORIA	 AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE
		 European Food Cold Chain Technical Committee
		
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EPEE's membership is comprised of 46 member companies and national associations across Europe realising a turnover of over 30 billion Euros and employing more than 200,000 people in Europe. Our member companies manufacture most of their products in the EU.

Role of RACHP sector in society



Cooling and heating are fundamental needs for society:

Refrigeration

Reduces food loss and subsequent CO2 emissions.
Ensures safe and affordable food supplies.
Safe transport of vaccines and medicine.

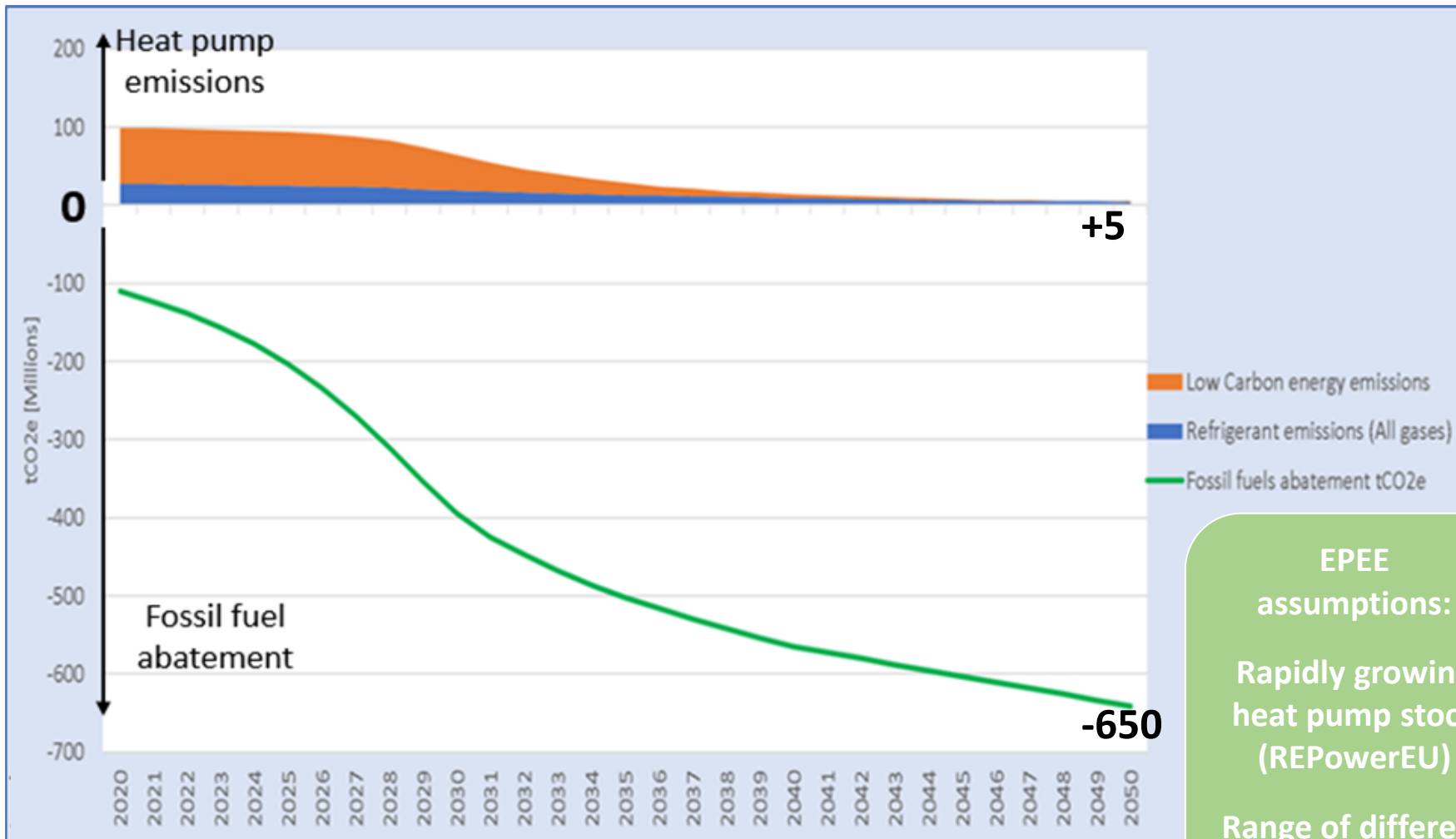
Comfort and industrial cooling

Necessary for health protection and productivity in homes, hospitals, offices and process industry.

Comfort and industrial heating

Heat pumps reduce dependency on fossil fuels, but also support DHC networks and recover waste heat.

Emissions of the sector: example from the model



Since 2012, EPEE has developed a powerful HFC Outlook EU Model tool, in recent years in partnership with UNEP:

- ➔ Assesses the **best pathways** towards achieving the Kigali Amendment.
- ➔ Gives data on the **placing on the market** and **emissions** of all types of refrigerants, including CO₂ emissions based on system efficiency.

EPEE assumptions:

Rapidly growing heat pump stock (REPowerEU)

Range of different lower-GWP refrigerants used

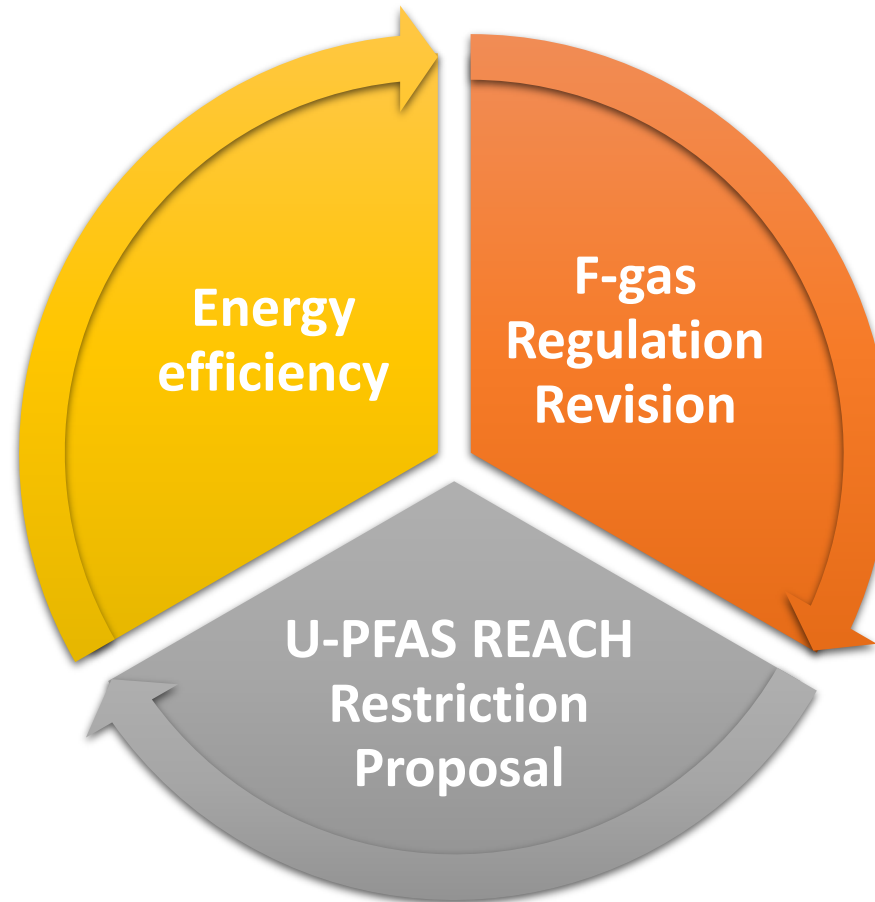
Interplay between PFAS and other files

Energy Efficiency-first Principle:

“taking utmost account of cost-efficient energy efficiency measures in shaping energy policy and making relevant investment decisions.”

So-called “natural refrigerants” cannot always guarantee the same level of:

- safety
- energy efficiency
- affordability



U-PFAS REACH Restriction:

Proposal to restrict the use of PFAS including F-gases and equipment using fluoropolymers

Classified as Business

F-gas Regulation: Further pushes the HFC Phase Down and transitions towards HFOs and non-fluorinated alternatives

The first two F-gas Regulations (2006/2014) are considered to be very successful.

Date of implementation: 2024

Date of implementation: 2028

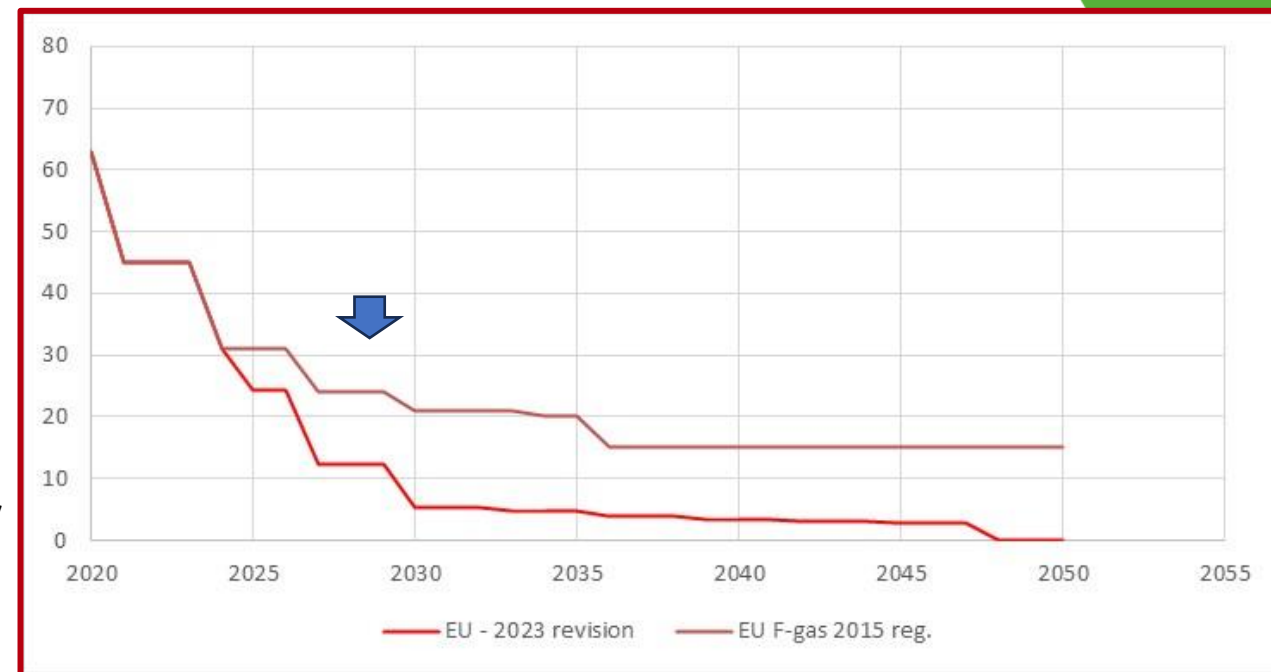
The F-gas Regulation

Regulates the use of fluorinated gases, as the transposition of the 1987 Montreal Protocol and the 2016 Kigali Amendment.

The first two Regulations already led to significant decrease in emissions.

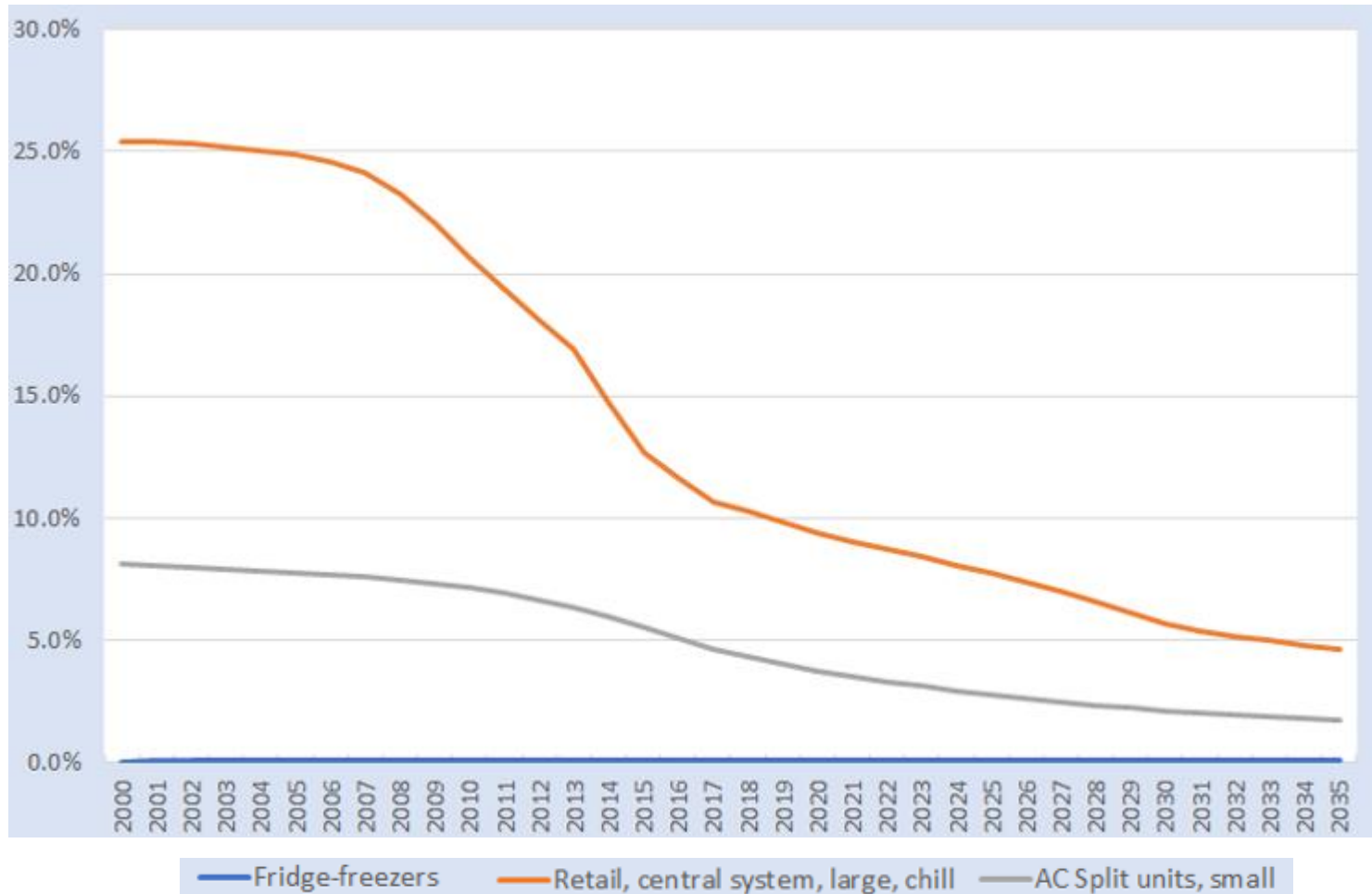
The third one, to be fully adopted in March 2024, will contain:

- stricter containment measures for HFCs, HFOs and blends
- full F-gas product bans after 2030 for several product categories, with review of their feasibility by 2030
- full phase out of virgin HFCs by 2050 with a review clause in 2040



⚡ This Regulation has a **similar purpose** to the PFAS Restriction proposal, as it also reduces environmental release and impact.

Emissions of the sector: low leakage rates

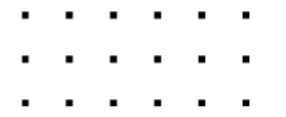


Emissions and leakage rates vary between products but are **generally low**.

Many small equipment types are factory-built sealed systems, with low operational leakage rate – below 1% per year.

More graphs and data are available in the full submission of EPEE.

Degradation products of F-gases



One of the reasons for the inclusion of F-gases is the partial degradation into trifluoroacetic acid (TFA), however **many independent experts and scientists consider TFA to be of low concern for human health and the environment:**

[EEAP, 2022:](#)

“all PFAS should not be grouped together, persistence alone is not sufficient for grouping PFAS for the purposes of assessing human health risk”

“based on projected future use of these precursors of TFA [including HFC/HFO], no harm is anticipated”

Emissions from refrigerants defined as PFAS

Outcome:

The emissions of PFAS refrigerants are decreasing year by year, indicating progress in reducing environmental impact.

	HFCs						HFOs				Total [tons]
	R-125	R-134a	R-143a	R-227ea	R-245fa	R-365MFC	R-1233zd(E)	R-1234yf	R-1234ze(E)	R-1336mzz	
2020	10.016	19.071	3.653	200	72	114	1	1.546	94	0	34.766
2025	8.503	16.099	2.424	169	-	-	15	3.617	384	6	31.218
2030	4.809	9.703	187	81	-	-	29	6.022	670	12	21.512
2035	2.654	4.301	20	-	-	-	43	8.686	999	17	16.720

From 2020 to 2035, the emissions will decrease by more than two.

Granularity of applications

➤ The use of F-gases is diversified across RACHP applications, with specific products having **specific characteristics that influence the choice of refrigerants**.

A broad restriction would:

Impede the
optimal
refrigerant
choice for new
equipment

Lead to
premature
obsolescence

Generate
unnecessary
waste

Hamper the
recovery and
reclamation of
refrigerants

Use of fluoropolymers

Fluoropolymers are **essential** for the functionality and tightness of RACHP products, with unique characteristics:

Sealing to prevent the release of refrigerant into atmosphere

Temperature and pressure resistance facing differentials from -50°C to 175°C and from near vacuum conditions up to 120 bar

Persistence and chemical inertness in aggressive environment

Unique electrical properties, like the low dielectric constant that does not break down when subjected to important electric fields

Low friction that enables components to be more sustainable and require fewer repairs

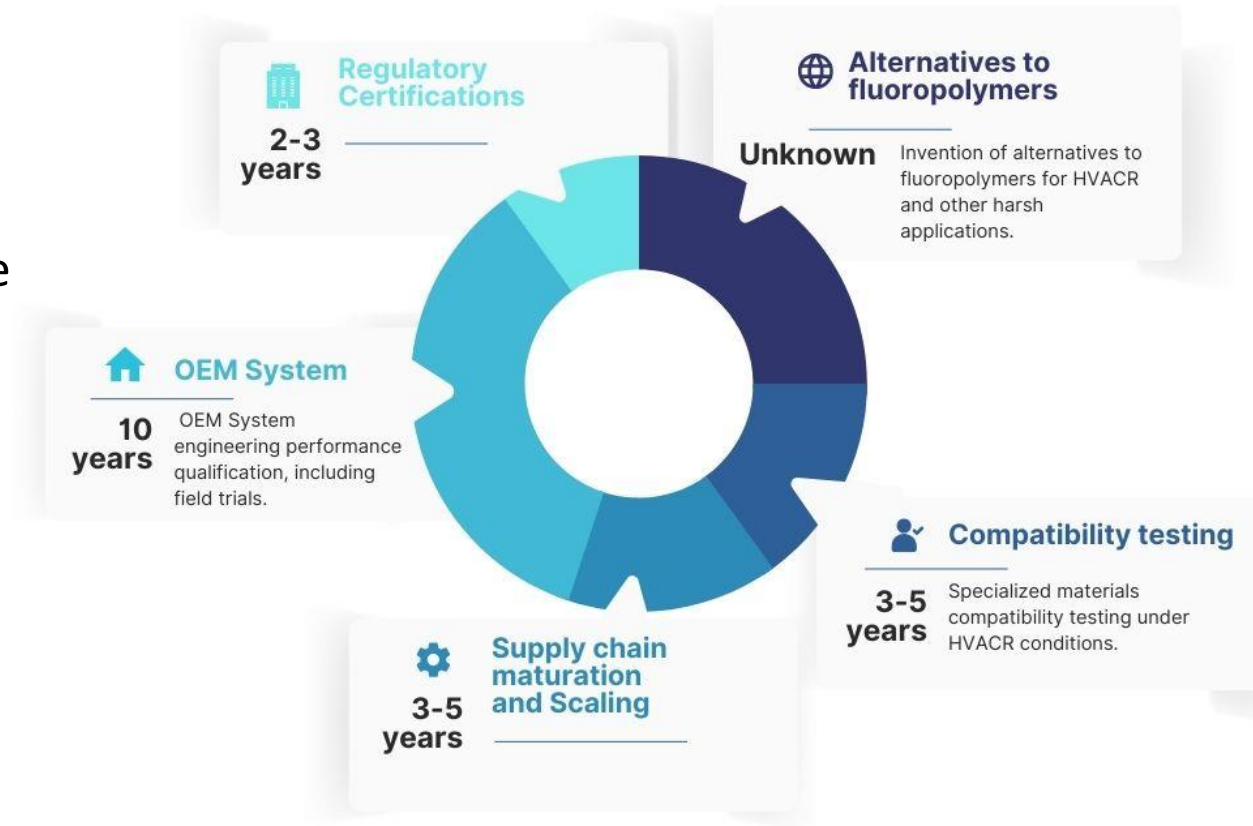
Today there is no viable alternative that can fulfill all the same criteria.

Lack of alternatives to fluoropolymers

Two possibilities:

- ➔ A return to previously used components, which were replaced for efficiency/safety reasons (e.g. lead)
- ➔ Development and implementation of innovative components.

The unlimited derogation included in the Proposal for “national safety standards and building codes” does not cover fluoropolymers, **equipment will not properly function without fluoropolymers.**



Internal estimation of time for developing alternatives to fluoropolymers, based on industry experience.

EPEE recommendations

For F-gases:

- Full time-unlimited derogation for F-gases used in RACHP applications, with a review clause 10 years after EIF to assess efficiency/availability of alternatives, but also for:
- Maintenance and refilling
- Reclamation and recycling of refrigerants
- Exports of pre-charged equipment

A reconsideration of the concentration limits as the current value proposed may jeopardize the efforts to recover, reclaim and reuse refrigerants.

For fluoropolymers:

- Full time-unlimited derogation for fluoropolymers used in RACHP applications, with a review clause 10 years after the EIF to assess availability and viability of alternatives, but also for:
- Spare parts, waste treatment and exports

A reconsideration of concentration thresholds to not hamper the circularity of components.

Thank you for your attention!

EPEE

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