



The Triple Challenge for the RACHP Sector

FPP4EU Conference, Federica Rizzo



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The voice of the RACHP sector in Europe



- Full Value Chain of **Refrigeration**, **Air Conditioning** and **Heat Pump** Industry
- Small – medium – large companies
- National and sectoral associations
- Over **200,000 direct employees**, over €30bn turnover Europe
- Main activities:
 - Promote **Decarbonisation** of Heating & Cooling
 - Ensure responsible management of all types of **Refrigerants**
 - Advise on **Eco-design and -labelling**



Corporate members



Association members



EPEE Members, representing 200K jobs in Europe, make the full product range of refrigeration, air conditioning and heat pump equipment, including ...



Residential Heat Pumps, e.g. hydronic



Air/Air Heat Pumps for residential and commercial use



Large AC and heat pumps (chillers, VRFs, rooftops, ...)



Commercial Refrigeration



Industrial Refrigeration



Transport refrigeration



District Heating and Cooling



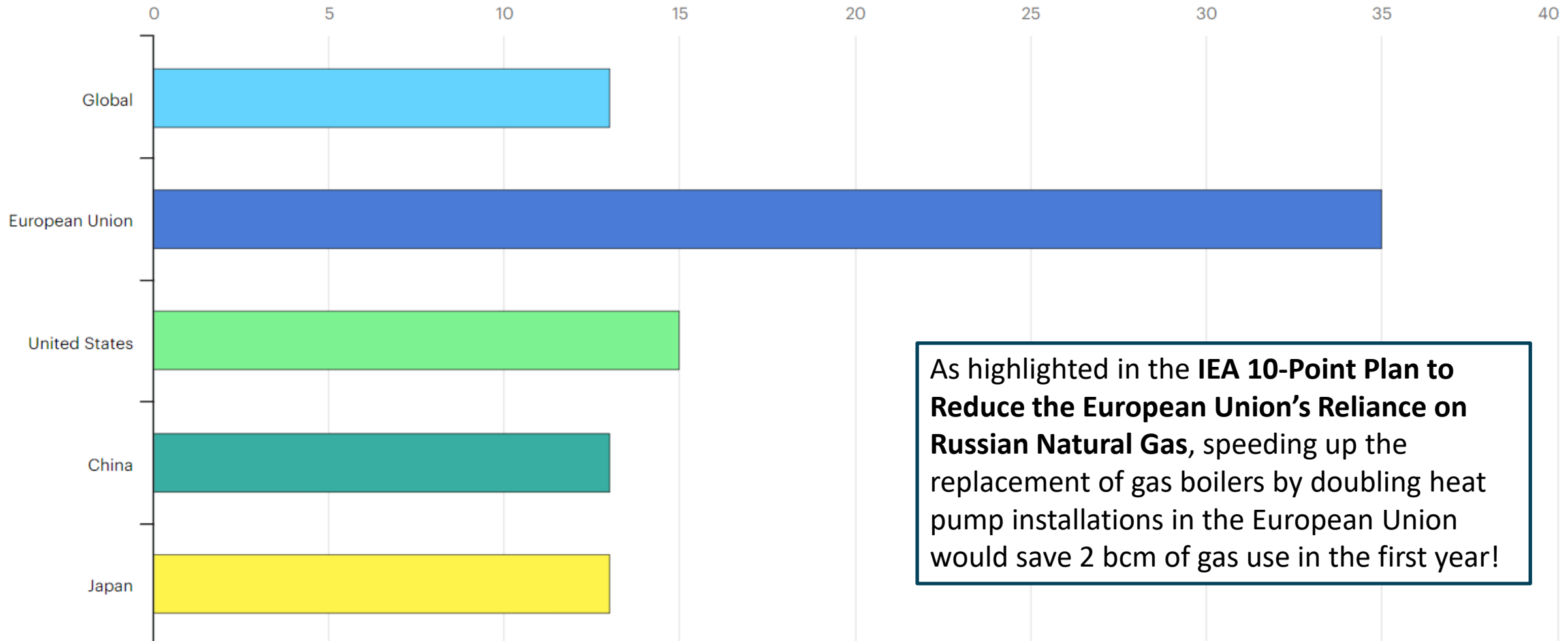
... which requires a diversity of refrigerants – F-gases (HFCs, HFOs) and natural refrigerants

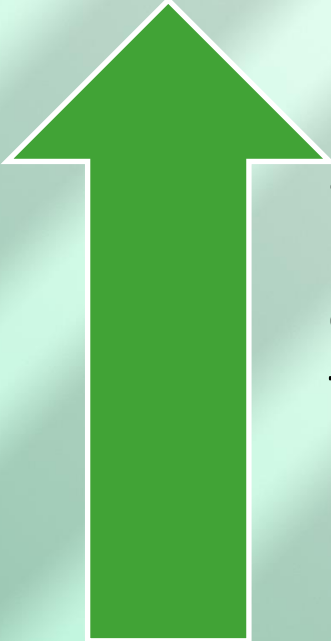
there is
increased evidence of
climate action

- The Montreal Protocol including the Kigali Amendment is one of the most important tools the world can use to mitigate the emissions of greenhouse gases and thereby **ensure** that **the global temperature *return to the “safe” level.***
- The **IPCC 6th Assessment Report** repeats the estimate that the Montreal Protocol can **contribute up to 0.4 °C in reduction of global temperature.**

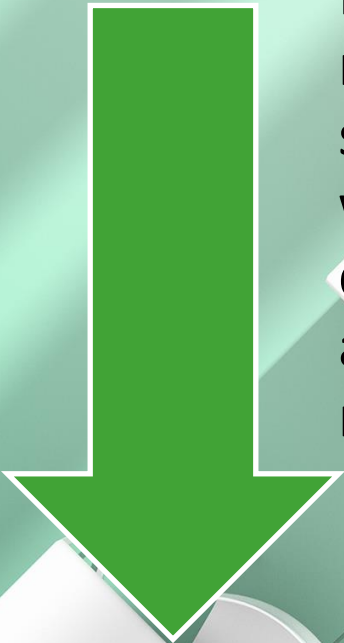
“It’s now or never”

Increase in heat pumps sales in selected regions, 2021 relative to 2020. Source: IEA Report, Nov 2022





It relies on refrigerants that are safe and energy efficient. F-gas emissions have impact on climate change due to their global warming potential (GWP*), which is being gradually lowered.



HFCs were developed in the 1990s to replace the ozone-depleting substances (CFCs and HCFCs), which were phased-out in Europe and other developed countries. Since 2014, HFCs are subject to phase-down mechanism..

*GWP= Global Warming Potential



RACHP Sector: F-gases

- ☐ *This process is carried out under the Montreal Protocol and the 2016 Kigali Amendment.*
- ☐ HFOs (and their blends) have a very short atmospheric life-time and ultra-low GWP (Global Warming Potential) values typically below 10 (i.e., significantly reduced compared to conventional (saturated) HFCs)



The wide EU PFAS definition used in the 2021 REACH Registry of Intentions resulted in unprecedented coverage of chemical substances.



RACHP Sector: PFASs



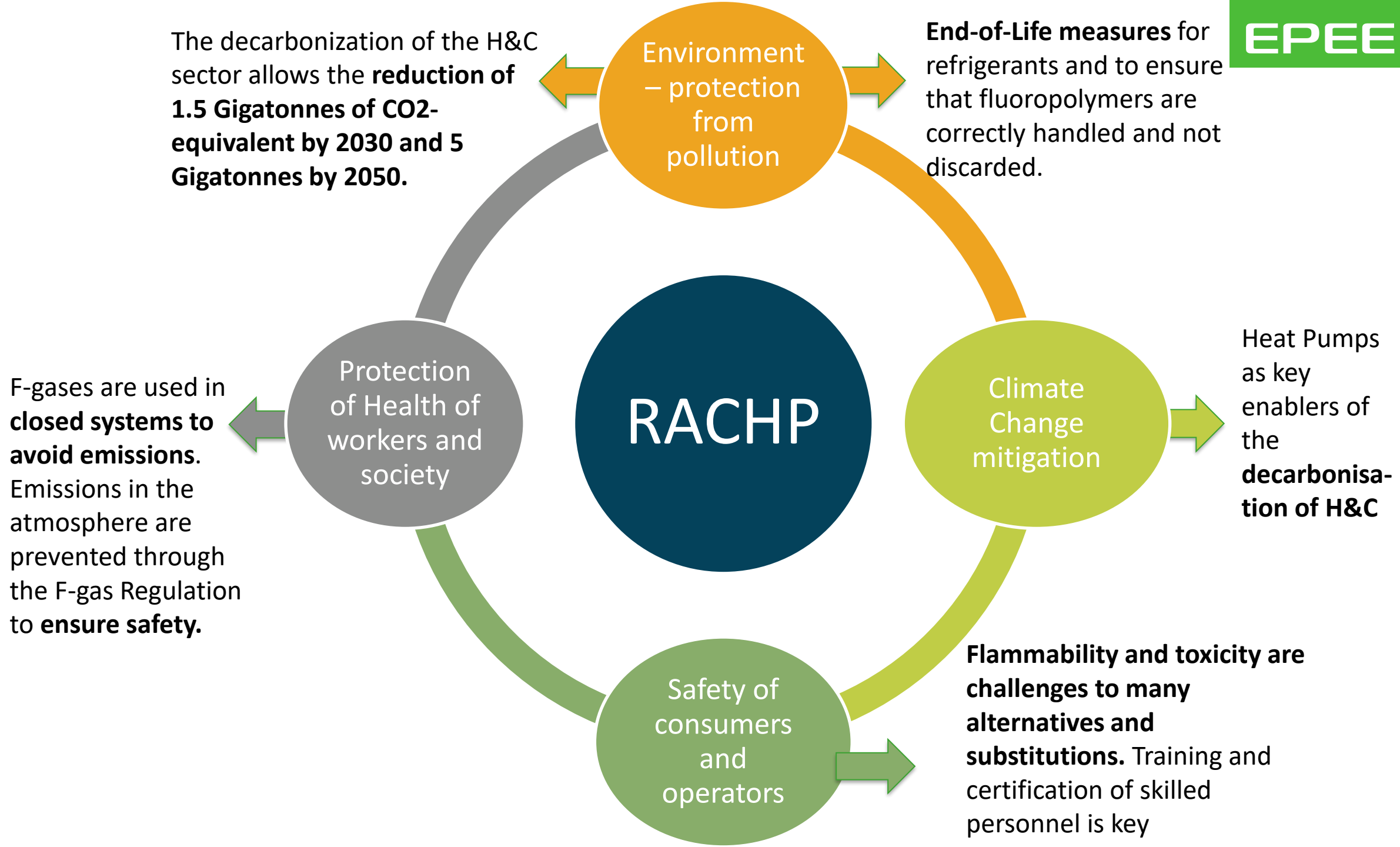
The analysis of impacted uses in the RACHP industry requires major and time-consuming effort within the whole supply chain.

The properties of the substances are the main reason for using them. **Refrigerants themselves are not water soluble** and do not have their fate in water eco-systems.

- ☐ **Lower GWP and energy efficient solutions** are key for the decarbonization of the sector.
- ☐ **State of the art alternatives for fluoropolymers** are lacking in functionality, performance and will endanger the efficiency, longevity and reliability of RACHP systems, causing additional leakages.



What is at stake?



The dilemma?

Phase down to reduce HFC

EPEE supports additional measures to prevent leakages from the use of HFOs, as well as to strengthen End-of-life measures.

Ultimate objectives:
Safety, climate neutrality, environmentally sound and energy efficient solutions.

PFAS:

Avoid risks to health & the environment. EPEE supports a science-based approach and proportionate measures

Heat Pump installations: strategic EU objectives (REPowerEU) to reduce the EU dependence on fossil-fuel imports and technologies.

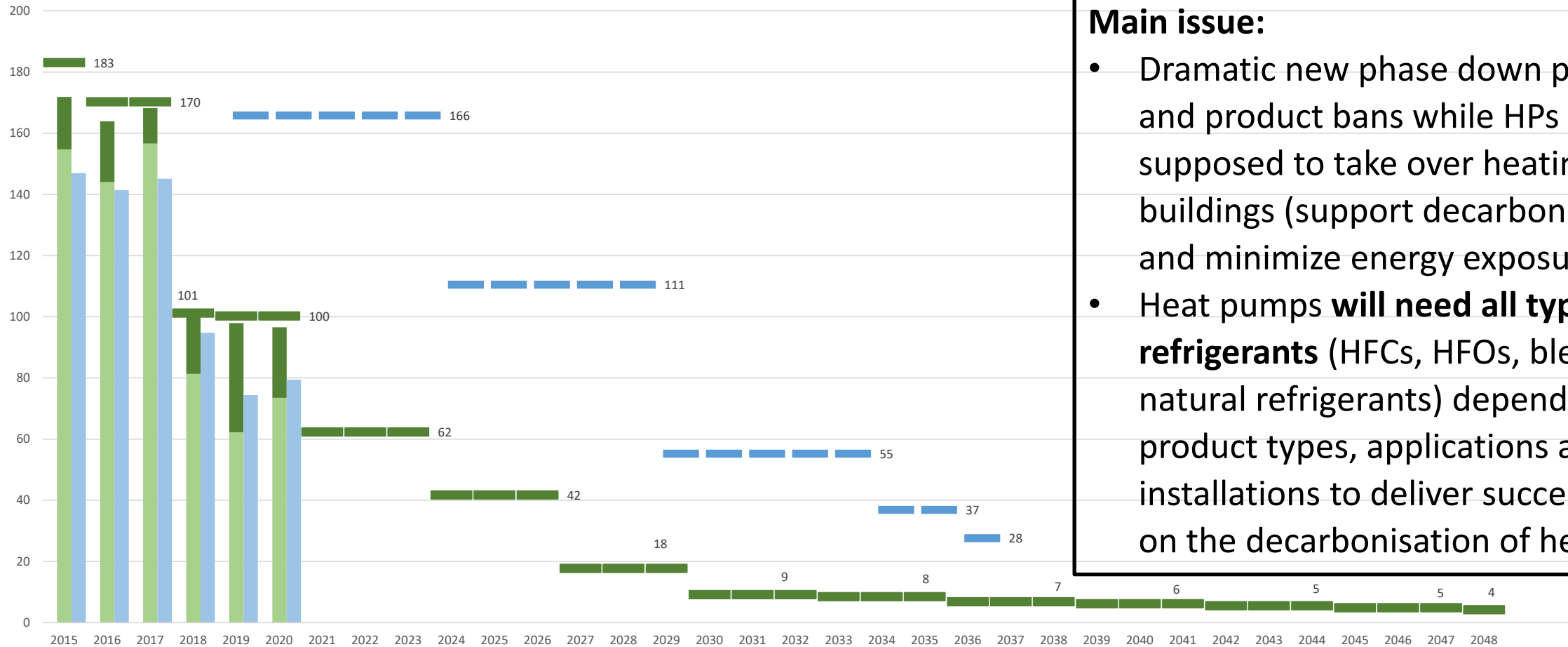
HFC phase-downs under EU regulation (proposal 2022) & Montreal Protocol

Source data: Fgas 2022 proposal & EEA 2021 report

Main issue:

- Dramatic new phase down proposal and product bans while HPs are supposed to take over heating in buildings (support decarbonization and minimize energy exposure)
- Heat pumps **will need all types of refrigerants** (HFCs, HFOs, blends, natural refrigerants) depending on product types, applications and installations to deliver successfully on the decarbonisation of heating.

Millions tonnes of CO₂ equivalent
(Mt CO₂-eq)

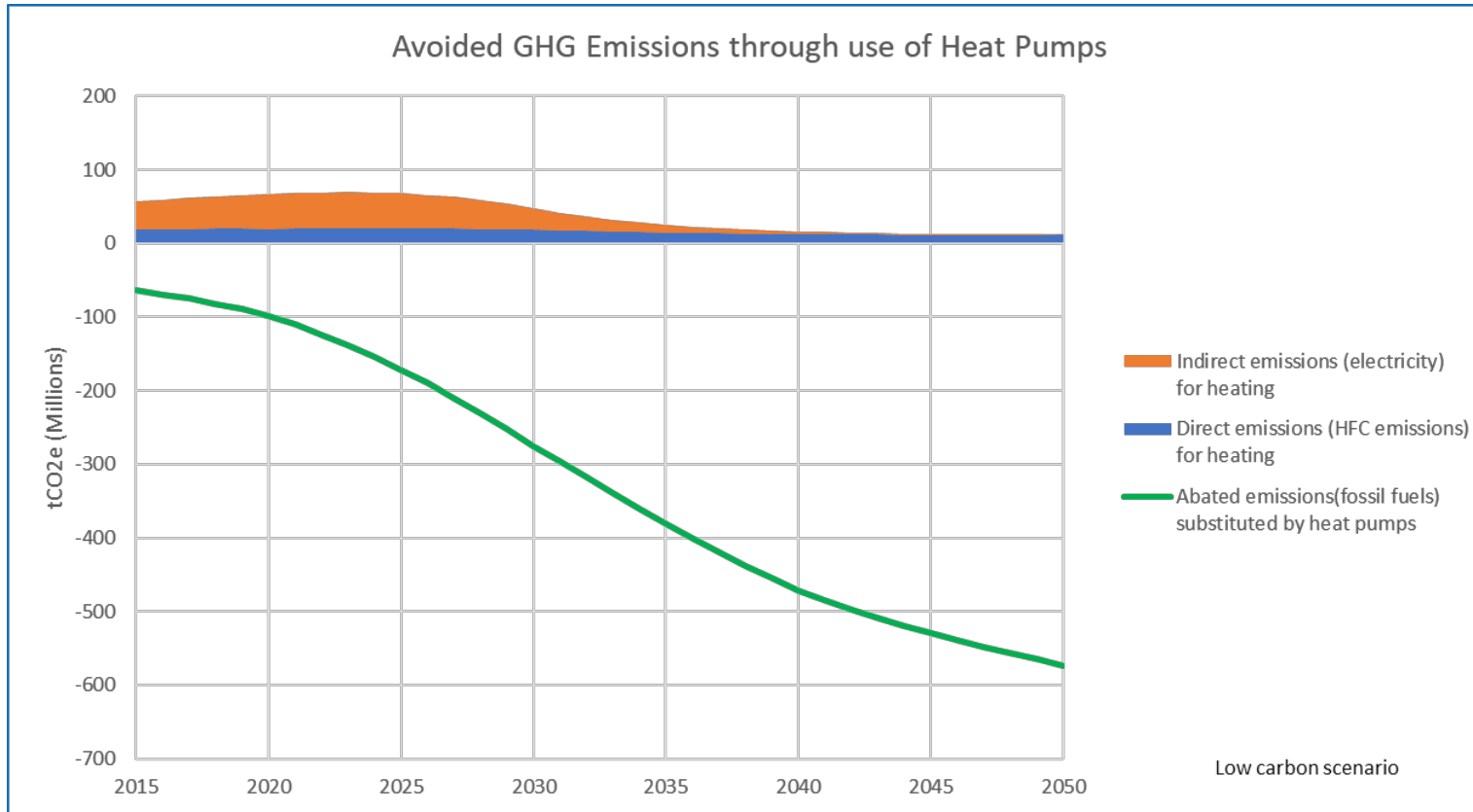


■ Issued authorisations to use HFC quotas (EU) ■ Quota-relevant bulk HFCs ■ HFC consumption (Montreal Protocol) ■ Maximum EU Quota (Fgas 2022) ■ HFC consumption limit (Montreal Protocol)

EPEE supports the phase-out fossil fuel heating in Europe



- **REPowerEU**: “double the yearly rate of heat pump installations”
- More than **60 million new heat pumps** should be installed by 2030
- Fossil fuel heating emits some **40 times more CO₂** during its lifetime



This is put at risk:

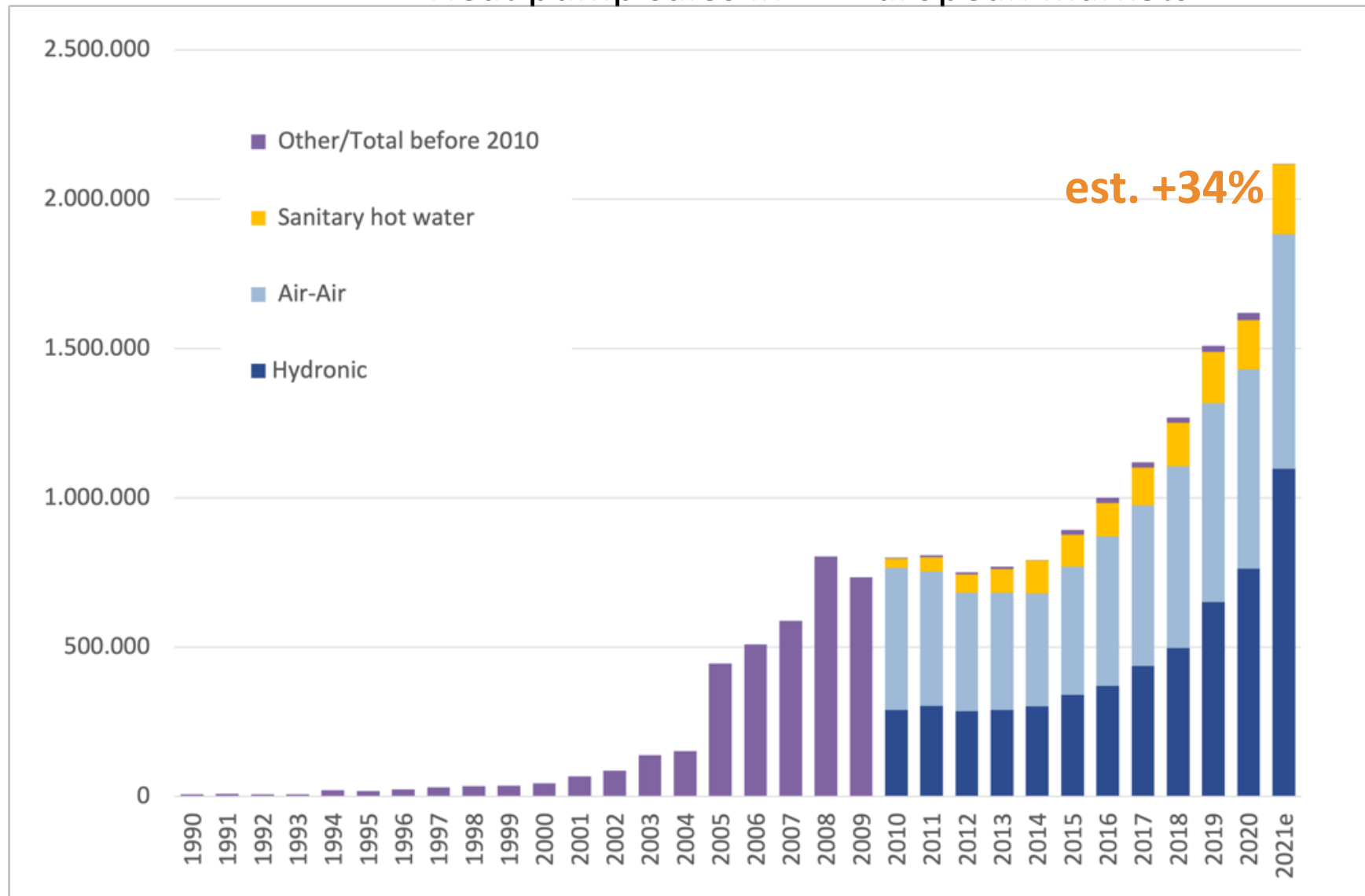
- The Commission proposal for a revision of the F-gas Regulation (and ENVI draft report) is **de facto an HFC phase-out from 2027** and imposes unclear and unrealistic product bans.
- It would make the energy transition much more **expensive** and **impossible in case of a PFAS REACH**.
- **A PFAS REACH broad approach** would further impact on this difficult scenario by restricting lower GWP refrigerants, that are needed for the refrigerants transition.



Source: HFC Outlook EU

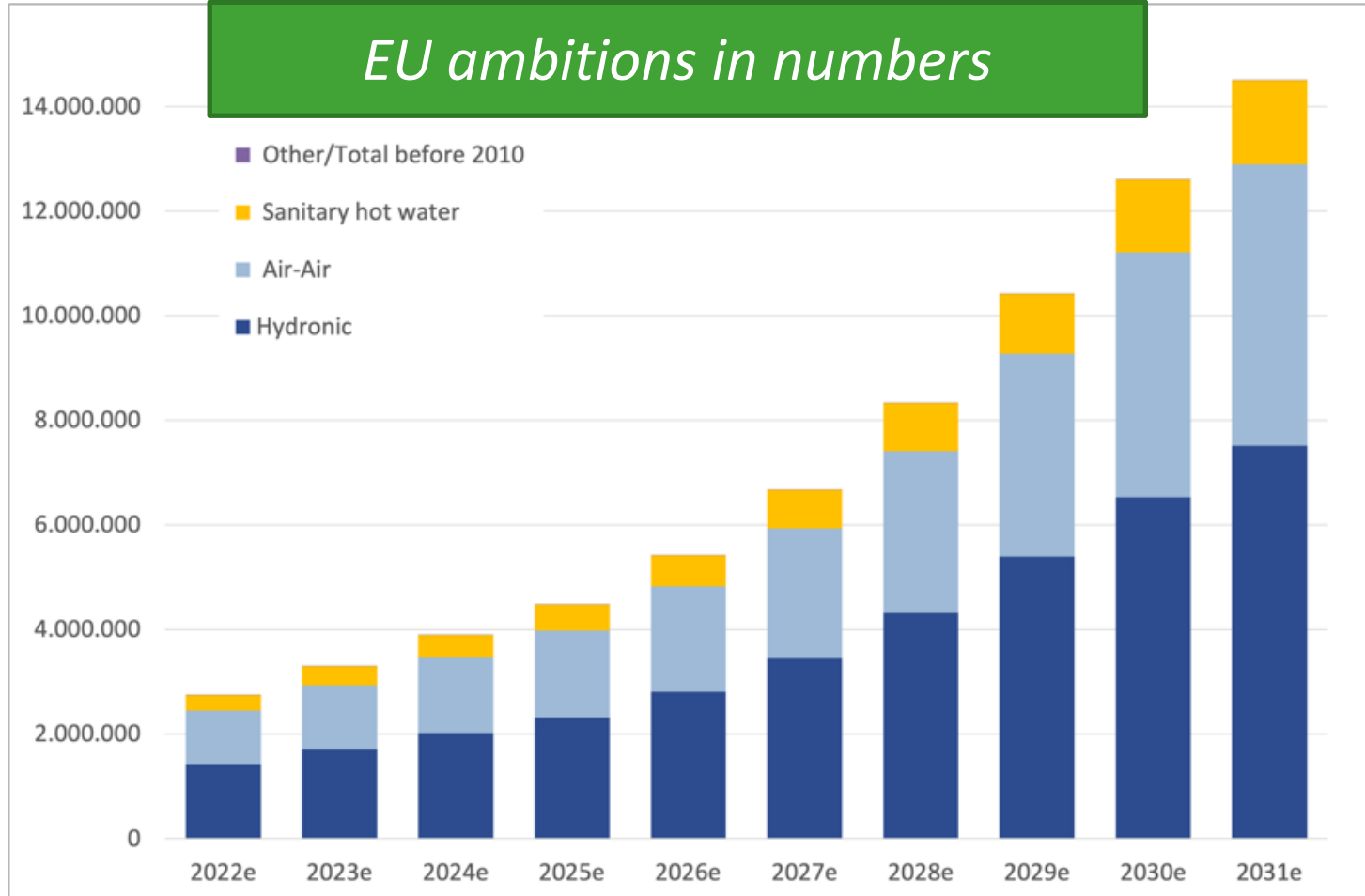
Markets are growing

Heat pump sales in 21 European markets



F-gas Regulation – incompatible with Repower

EU targets



Estimate sales based on REPowerEU

Insights

- EU aims at doubling current deployment rate of individual HPs => cumulative 10 million (hydronic) HPs over 5 years
- EHPA extrapolation to all technologies
- 20 million by 2027 & 60 million by 2030

Overview of the principles of the F-gas regulation

The EU is taking regulatory action to control F-gases, as part of its policy **to combat and mitigate climate change**



The objective of the F-gas Regulation is to reduce emissions of F-gases by addressing the following aspects:

Life cycle assessment:

- ✓ The containment, use, recovery and destruction of F-gases (**End-of-Life measures**). Possible extension to alternatives.
- ✓ The control of certain uses of the gases
- ✓ The application of 'placing on the market' prohibitions on certain products and equipment

Identification:

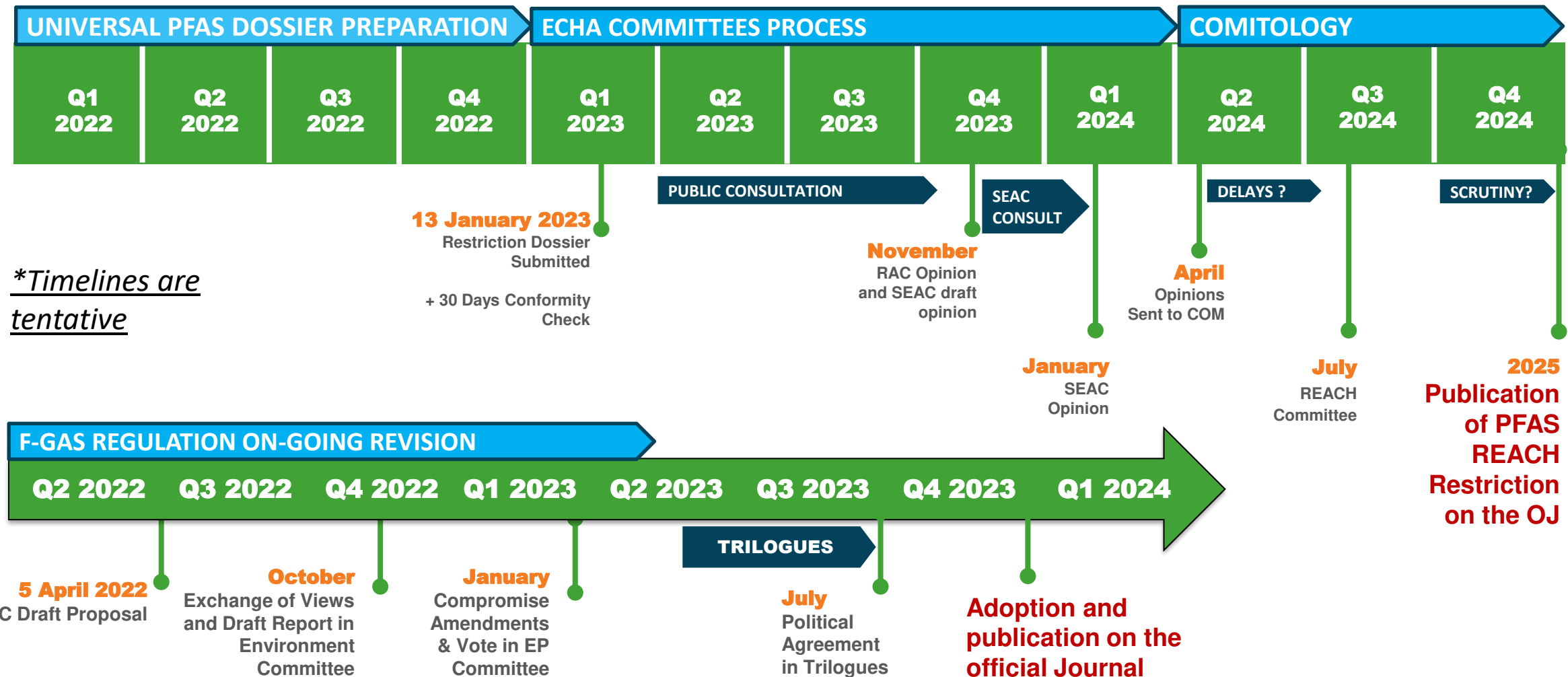
- ✓ The **labelling** and disposal of products and equipment containing those gases
- ✓ Better **monitoring** through the use of electronic Logbooks

Compliance:

- ✓ The **Reporting** of information on those gases, improve data on Recycled and Reclaimed refrigerants.
- ✓ The **Training** and **Certification** of personnel and companies involved in activities covered under this Regulation

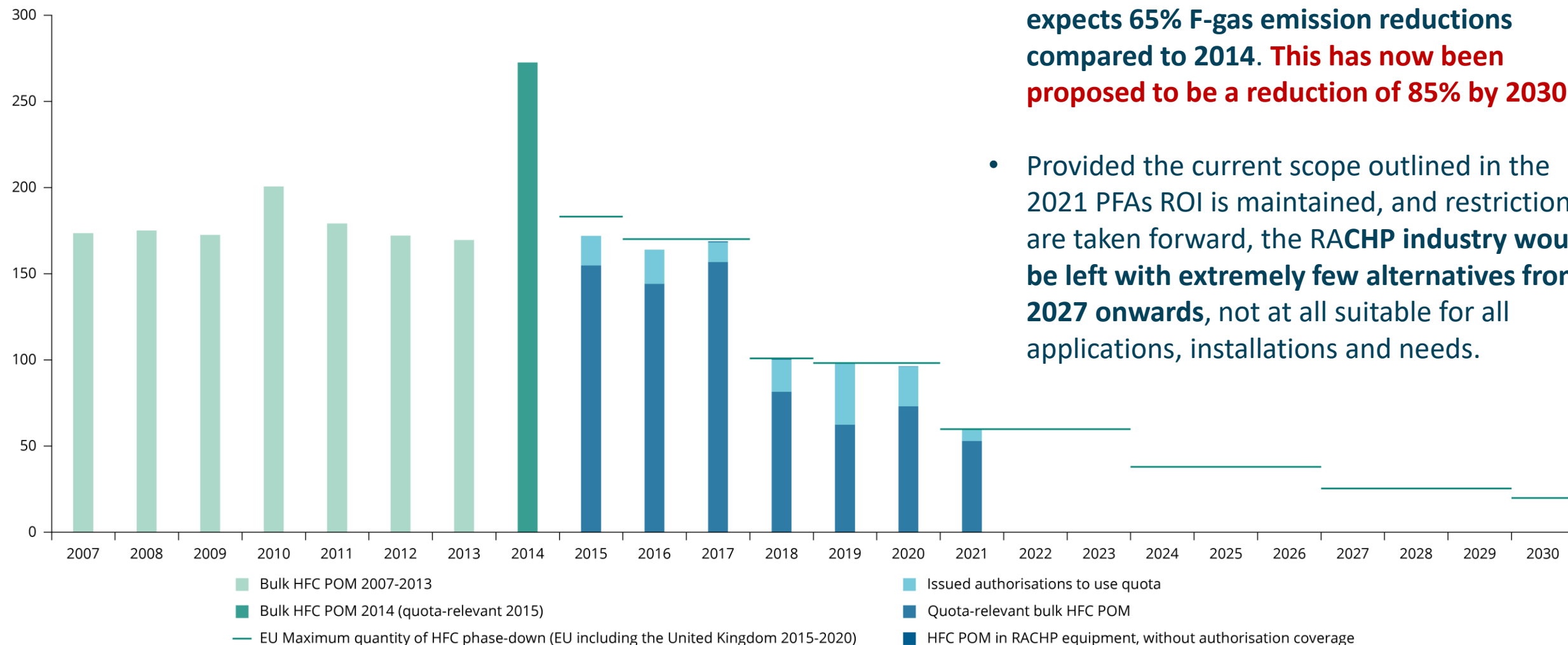
Possible timeline of the F-gas Regulation & PFAS REACH

The proposed F-gas Regulation measures are currently being discussed. This includes new stepped phase down scenario and a new set of bans. *The industry is faced with two challenges in parallel with “un-matching” timelines, leading to high uncertainties.*



What alternatives are available ?

Million tonnes of CO₂ equivalent (Mt CO₂e)



- Since 2015, F-gas emissions have started to fall as a result of the EU's F-gas Regulation + MAC Directive. **By 2030, the European Commission expects 65% F-gas emission reductions compared to 2014. This has now been proposed to be a reduction of 85% by 2030.**
- Provided the current scope outlined in the 2021 PFAs ROI is maintained, and restrictions are taken forward, the RACHP industry **would be left with extremely few alternatives from 2027 onwards**, not at all suitable for all applications, installations and needs.

Source: European Environmental Agency Fluorinated Gases 2022 Report

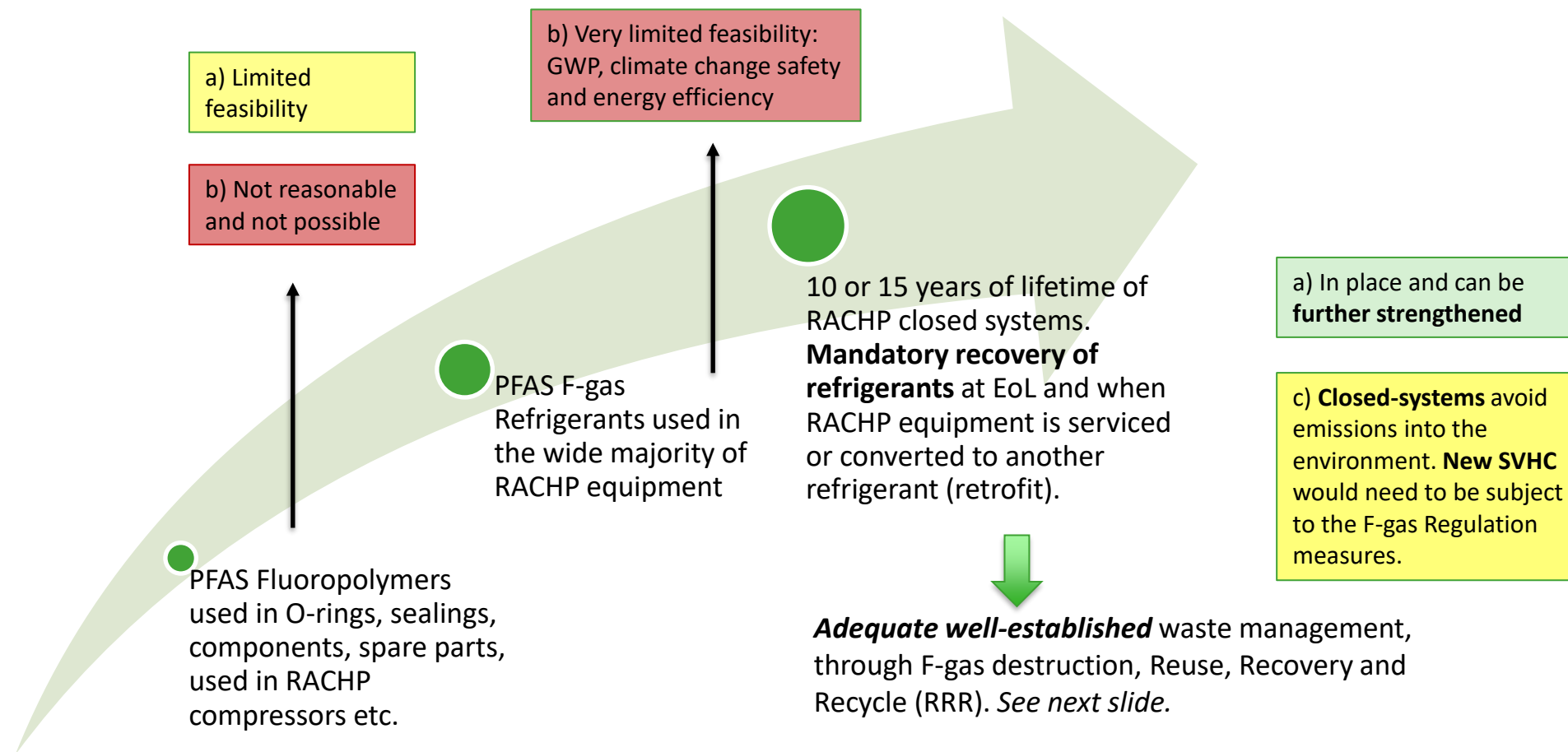
Major challenges for the RACHP sector?

- Potential risk of **lack of supply for servicing and maintenance of already existing equipment** (*lifetime of products is approx. 15/20 years*) and the manufacture and export of lower-GWP equipment;
- The discovery and development of alternatives depends on the *safe, reliable, energy efficient refrigerant choice, the state of the art of technologies, the chemical compatibility* when testing refrigerants and oils.
- A **PFAS REACH approach** would cause a series of unintended consequences, where at least 10 years of transition (*highly speculative timeline*) are needed in view of the bench and functional testing, suppliers and supply chain readiness and field testing.
- **Regrettable substitutions in PFAS Fluoropolymers** due to the **increase of refrigerant leakages from less effective sealing**. In the case of alternative flammable or toxic refrigerants (which are becoming more common as they are ultra-low GWP substances), leakages would also cause **major safety concerns** for users and consumers.
- The interplay of F-Gas Regulation and PFAS dossiers it very difficult for EPEE members to commit to a more ambitious HFC phase down in the F-Gas review, without clarity on the PFAS scope.

PFAS in the RACHP sector: an overview of the challenges

CRITERIA (letters are reflected in the graph):

- a) **Environmental sound-closed systems / recycling**
- b) **Dismantling and sorting SVHC substances**
- c) **Avoid SVHC in waste.**



COLORS show level of challenge:

Not reasonable and not possible or very limited feasibility

Limited feasibility or difficult implementation of measures

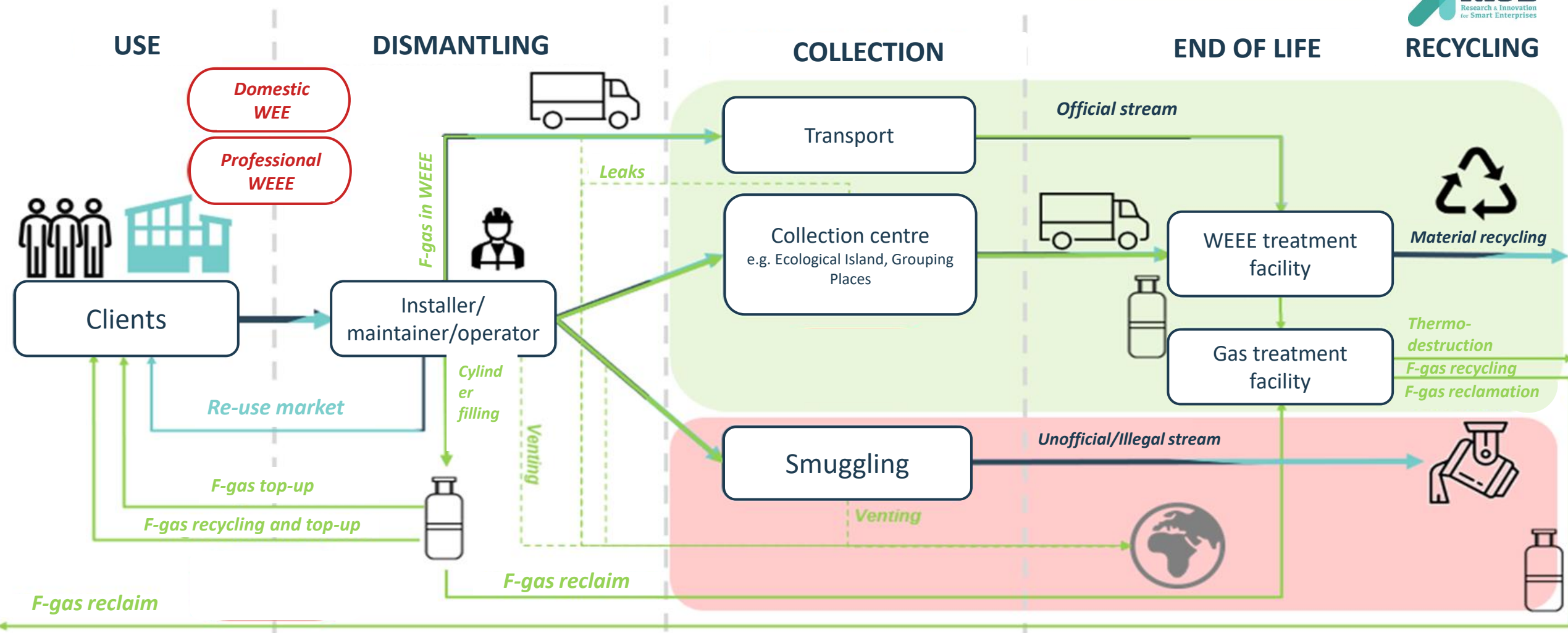
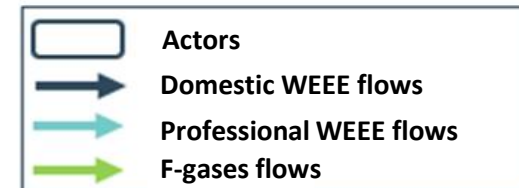
Already in place / can be strengthened

What do we expect today?

- ❑ An EU **broad definition of PFAS** would include all F-gases, where only few of commercially used refrigerants would be excluded from scope
- ❑ Competent Authorities should consider the **existing risk management measures** in place and the **safety concerns**. Moreover, the on-going revision of the F-gas Regulation offers the opportunity to further strengthen its successful measures (new products bans and stepped phase down have been proposed).
- ❑ The Upcoming ANNEX XV Universal PFAS should already exclude certain uses or products categories, where alternatives are not available. This would avoid costs and administrative burdens upon the administrative authorities and companies.

This would also avoid the fragmentation of the market. A PFAS Reach may fall short of considering all the relevant circumstances.

F-Gases and WEEE End-of-Life



- I. Finding a **balance among the several policy objectives** is key for the decarbonization of the sector and protection of health and the environment.
- II. **F-gases , Fluoropolymers and FluoroElastomers** as defined in the broad 2021 EU PFAS scope are vital for the RACHP industry. This is due to various unique technical aspects, state of the art technologies risks of unintended consequences, **at expenses of safety, energy efficiency and climate**.
- III. The EU climate targets are seriously threatened especially the **roll out of heat pumps** may become impossible, unless specific exemptions are introduced.
- IV. **EPEE is strongly supporting best market practice and End of Life targets and enforcement.**
- V. As Downstream Users, EPEE acknowledges that breakdown products are found in nature, *e.g. TFA from certain F-gases*. We look forward to the conclusion on the competent authorities concerning the scientific evidence and potential mitigating measures. **EPEE members are fully cooperating with the authorities** and in within the supply chain operators to address any possible risks and prevent emissions in the environment.

Q&A session

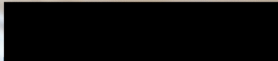
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