RACHP Restrictions in the new EU F-gas Regulation

36th ECA online meeting

20 November 2024

Main pillars of the EU F-gas Regulation

Reducing HFC use

- **Phase-down of HFCs (Quota system)**
- **Specific prohibitions on use of old / marketing new products & equipment**

Reducing HFC losses („life-cycle refrigerant management“)

- **Emission prevention rules, Leak checks, Certification/Training of Technicians, Recovery Obligation, End-of-Life Treatment, …**

Controlling & enforcement

- **Trade licensing, Custom rules, Market surveillance, Labelling, Penalties, Reporting**

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Rationale for Prohibitions/Restrictions

A prohibition is sensible when there are suitable (safe, energy-efficient,..) alternatives available

Today this is the case in many sectors already, in particular:

→ Use of R404A (GWP 3922) in refrigeration and R410A (GWP 2088) is not necessary anymore

- Kigali goals can potentially be achieved also through prohbitions, e.g. R404A

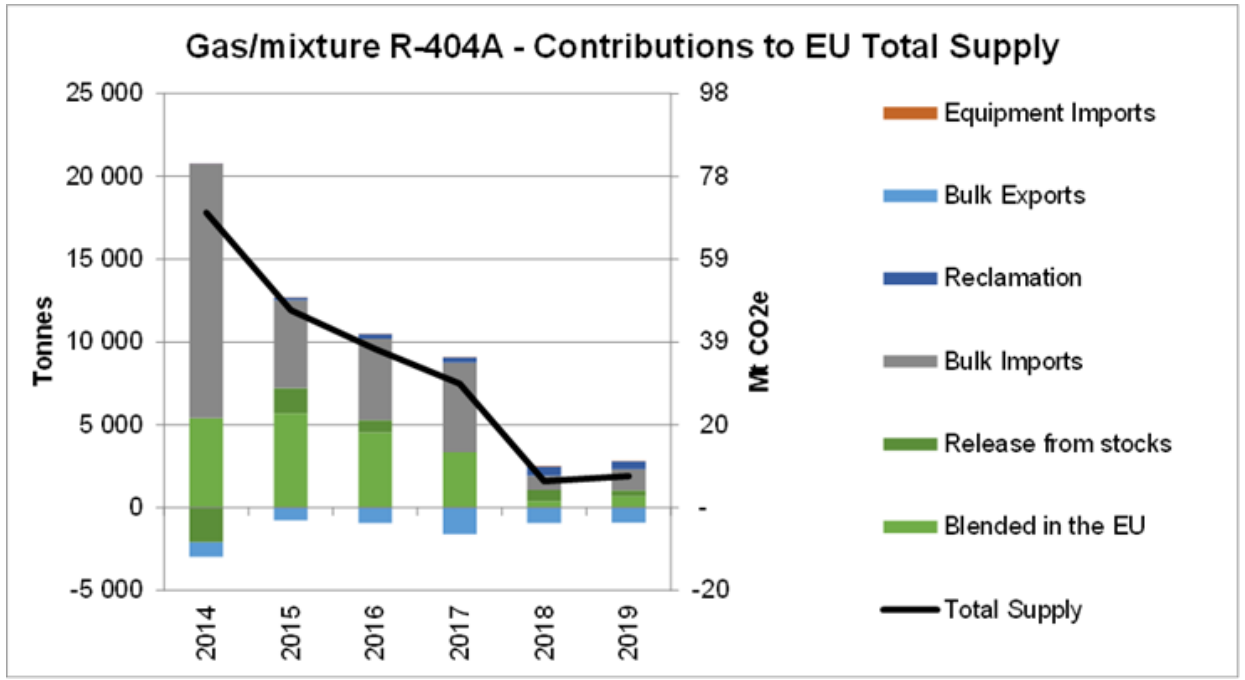
Different types of prohibitions, targetting:

- **New equipment**: **Avoid build-up of banks and future servicing needs**
- **Equipment in use**:
  - Reduce consumption by **incentivising recovery** and **use of reclaimed** gases, by **banning virgin gas**!
  - Remove use of high GWP substances by **retrofitting** old equipment or **replacing** it with new equipment

Effects of prohibitions from 2014 Fgas Regulation

Example **R404A**: Use ban from 2020 for larger refrigeration equipment

Supply of R404A (used in refrigeration) to EU:



Source: EEA F-gas report 2020

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Refrigeration – EU market situation today

Supermarket systems	Transcritical **CO_2 systems** with high energy efficiency are now the standard solution for new supermarket refrigeration systems. Components and specialized technical personnel are widely available. 71,800 systems installed
Stand-alone commercial systems	Systems running on **R290 as a refrigerant are the standard solution** for small shops and discounters (refrigerated shelves, freezers etc.) 3.2 million systems in supermarkets
Small charge ammonia systems	Small systems in industrial refrigeration 3,360 systems installed
Transport refrigeration	Research and development as well as **market introduction of CO_2 and propane** solutions for refrigerated trucks and vans
Refrigerant recycling and reclaim	Specialized refrigerant handling companies collect recovered refrigerants from service companies and gas distributors and perform analytical checks.

Restrictions in new **refrigeration** equipment

	Existing	Near term	Medium term (2030+)
Domestic	**<GWP150** (2015)	**No F-gases** (2026)	
Commercial Fridges/Freezers	**<GWP150** (2022)		
Other self-contained	<GWP2500 (2020) Except for T<-50 C	**<GWP150** (2025)	
Multi-pack supermarket systems	**<GWP150** (2022)		
Small chillers <=12kW	<GWP2500 (2020) Except for T<-50 C	**<GWP150** (2027)	**No F-gases** (2032)
Large chillers >12kW		**<GWP750** (2027)	
All other refrigeration	<GWP2500 (2020) Except for T<-50 C		**<GWP150** (2030)

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Restrictions in new **AC** equipment

	Existing	Near term	Medium term (2030+)
Small self-contained AC/Heat Pumps <=12kW	**<GWP150** (2020) Movable plug-ins only	**<GWP150** (2027)	**No F-gases** (2032)
Large self-contained AC/Heat Pumps >12kW		**<GWP150** (2027) <=50kW	**<GWP150** (2030) >50kW
Small split AC/Heat Pumps <=12kW	**<GWP750** (2025) Single splits with max 3kg charge only	**<GWP150** (2027) A/W **<GWP150** (2029) A/A	**No F-gases** (2035)
Large split AC/Heat Pumps >12kW		**<GWP750** (2029)	**<GWP150** (2033)

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Safety requirements

Many prohibitions are conditional on site-specific safety requirements

If the conditions in a **particular location** do not allow the use of refrigerants that would comply with the ban (due to e.g. room size dictated by *relevant* local codes, national restrictions or European standards), then other equipment may be installed

Operator (enduser) needs to **keep such evidence**, the installer should advise and support the operator by establishing the evidence

There is a **labelling requirement** for all placing of the market of equipment to be installed under the safety requirement exemption

Restrictions on equipment already in use

„Service ban“

- **Since 2020**: Upper GWP limit of 2500 for servicing larger refrigeration equipment (40tCO2 charge)

  *Exemptions for military use, ultra low temperatures (-50C) and **recycled/reclaimed gases***

- **This eliminates the use of virgin R404A/507A (unless recycled/reclaim)**

  Incentive for..
  - effective recovery
  - gas recycling/reclamation
  - retrofit or replacement of old equipment

Reduces consumption strongly!

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Evolution of service ban

- 2025: Extension to all refrigeration equipment (**no size limitation**)
- 2026: **Extension to AC** (GWP 2500)
- 2030: Exemption for recyled/reclaimed gases ends for refrigeration
- 2032: Exemption for recycled/reclaimed gases ends for AC

  → *The **final end of all R404A use in EU***

- 2032: **GWP limit lowered to 750 for stationary refrigeration** equipment except chillers → *This targets e.g. R134a*

*Exemptions for military use, ultra low temperatures (-50C), nuclear power stations and **recycled/reclaimed gases***

Additional restrictions on products & equipment

Other sectors

- Extension of placing on the market ban of **non-refillable containers** to prohibit all import, subsequent supply, use or export (empty, partially filled, or filled)

- **Aerosols**: *<GWP150 from 2018,* **No F-gases** from **2030**
- **Foams**: *<GWP150 from 2023,* **No F-gases** from **2033**
- **Personal care products** (e.g. mousses, foams, sprays): **No F-gases** from **2025**
- **Skin cooling equipment**: <GWP150 from 2025

Export bans

- New: From March 2025, **export prohibitions** on foams, technical aerosols, stationary refrigeration and air conditioning **equipment with F-gases** with a GWP of 1000, unless import not yet banned in the EU
- New: EU Undertakings must ensure that export of RAC equipment does not violate import restrictions that the importing country has notified under the Montreal Protocol

Policy review & preparation

- How well have current rules worked? Ex post analysis, „**Evaluation**“
- What policy options are there to address remaining challenges, how much will they deliver in environmental, economic and social terms? „**Impact assessment**“

Both documents drafted on the basis of an **external study** by independent consultants including bottom-up model (inventory) https://climate.ec.europa.eu/eu-action/fluorinated-greenhouse-gases/documentation/review-2014-regulation_en#paragraph_3374

Wide **consultation of stakeholders,** including **open public consultations** and **targeted consultations** of most relevant industry associations

„**Have your Say**“

- **Roadmap Feedback** 29 June 2020 – 7 September 2020 (76 responses)
- **Public Consultation** 15 September 2020 – 29 December 2020 (241 responses)
- **Adopted Documents** 8 April 2022 – 29 June 2022 (155 responses)

https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12479-Review-of-EU-rules-on-fluorinated-greenhouse-gases/public-consultation_en

Commonly used arguments

- Costs
- Safety and safety standards → important advances, i.e. IEC 60335-2-40 (AC) and -89 (refrigeration)
- Energy efficiency
- Energy security, e.g. heatpump rollout

There are innovators and there are companies interested in maintaining the status quo

Chillventa 2024: **R290 everywhere**;

Component manufacturers will produce what equipment manufacturers demand, the technology exists; **quite often a policy push is needed**

What do we expect out of this?

- **Emission reductions**: By 2050, avoid (cumulatively) over 300 MtCO2eq additional savings from the 2024 modification of the Fgas Regulation
- **Modest Costs:** In *most cases* will be low compared to those asked of non-Fgas sectors on the road to climate neutrality, and will in *all cases* be proportionate

Technology adjustment costs only €6/tCO2eq (2015-19)

lower than estimated beforehand (€17/tCO2eq)

- **Energy savings** for endusers of refrigeration and air conditioning equipment due to more efficient equipment

→ for many sectors, in particular RAC, abatement costs will be negative

- **Prohibitions** are today feasible in many areas to eliminate HFCs, or at least reduce GWP significantly
  - One-way cylinders should be banned!
  - R404A/R507A is obsolete today in refrigeration. Similarly, R410A is a bad choice for AC, as (also) not very energy-efficient
  - GWP levels can be used to adjust the ambition level
- **Prohibitions complement quota systems** by reducing consumption, harvesting low-hanging fruits and facilitating implementation and control
- Further, **monetary measures** could be considered (taxes,..)

Thank you

Arno Kaschl

https://ec.europa.eu/clima/eu-action/fluorinated-greenhouse-gases_en

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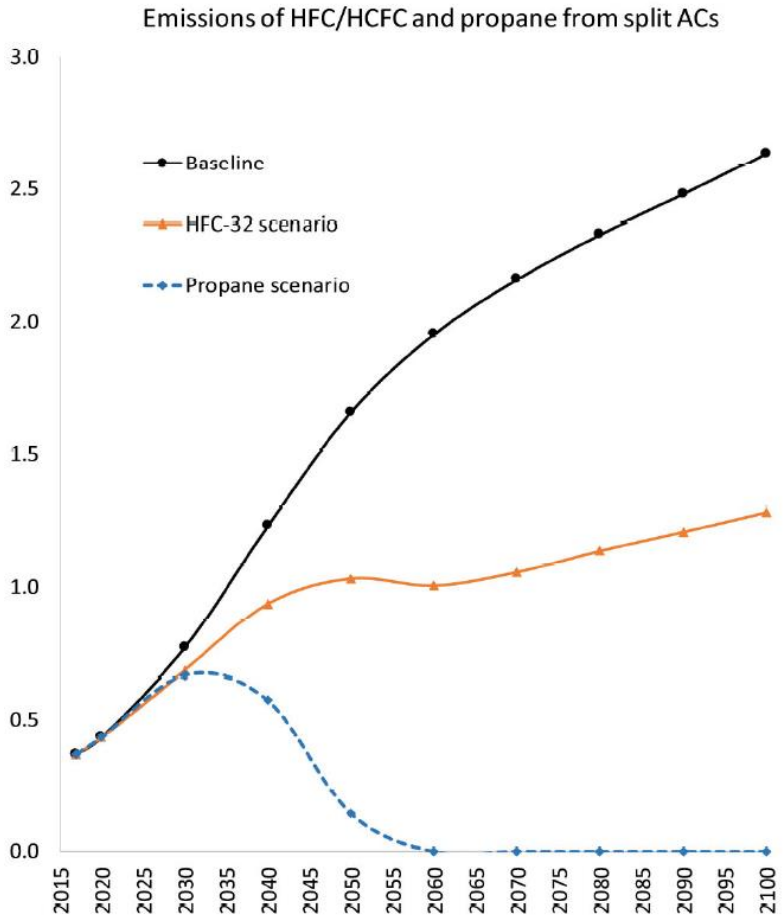
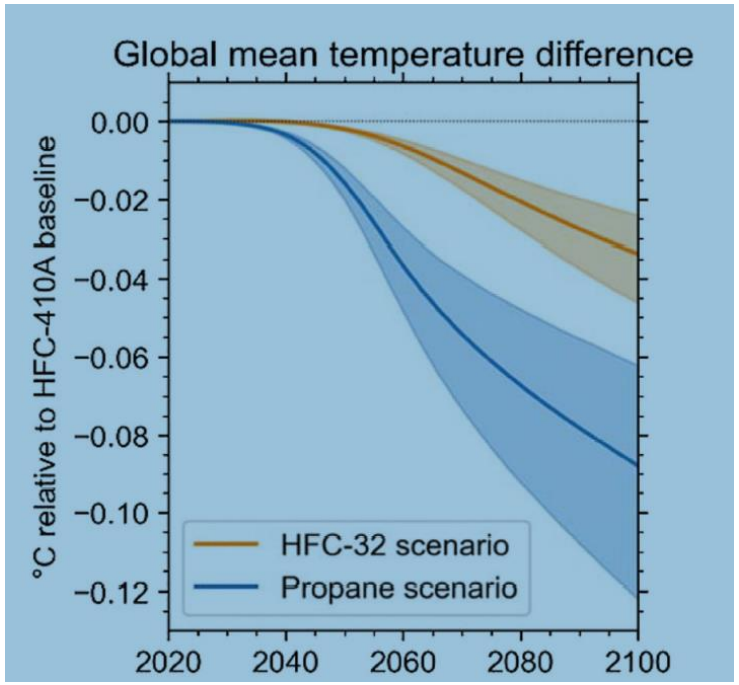
A crucial sector: Split AC





→ **Global action can save 0.1 degrees C of warming just from this sector!**

Purohit et al. (2022). PNAS.

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