Innovative Approaches for the Implementation of the Kigali Amendment

OEWG44 side event, Bangkok Thailand

11 July 2022

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of

Federal Ministry for Economic Cooperation and Development

Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection

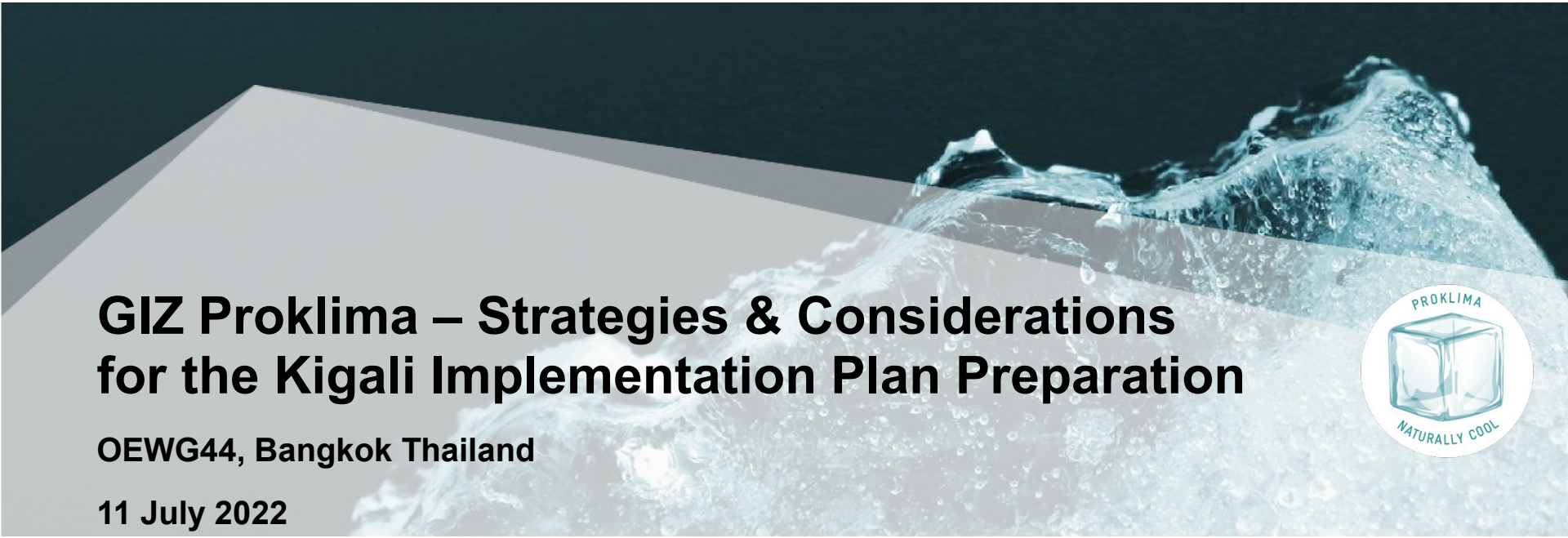
Agenda

1:00 pm – get together, lunch	
1:30 pm-2:30 pm – presentations	
Welcome Remarks	Dr. Claudia Hiepe, Federal Ministry for Economic Cooperation and Development (BMZ) of the Republic of Germany
Strategies and Approaches for KIPs by Implementing Agencies: GIZ Proklima and UNDP	Birgit Mayer, GIZ Proklima Kasper Koefoed, UNDP
EU HFC Management	Dr. Arno Kaschl, European Commission
Questions & Answers	All participants
Conclusion and Closing Remarks	Bernhard Siegele, GIZ Proklima

Welcome Remarks

Dr. Claudia Hiepe
Federal Ministry for Economic Cooperation and Development (BMZ) of the Republic of Germany

Federal Ministry
for Economic Cooperation
and Development



GIZ Proklima – Strategies & Considerations for the Kigali Implementation Plan Preparation

OEWG44, Bangkok Thailand

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giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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Agenda

1. **Introduction of GIZ Proklima: Core expertise**
2. **Kigali Implementation Plan: Scope and Schedule**
3. **How is the KIP different?**
4. **Strategic Focus Approaches**
   - **4.1 HFC survey**
   - **4.2 Assessment of Training Infrastructure**
   - **4.3 Green Cooling – leapfrogging to natural refrigerants**
   - **4.4 HFC regulations & other key topics**

GIZ Proklima core expertise - since 1995

Policy Advice

Support of evidence-based decision making for sustainable sector strategies

Example: RAC&F sector inventories in more than 15 countries

Capacity Building

Training of more than 600,000 technicians on site

Cool Training in Germany

QCR scheme with "Fit for Green Cooling" approach

Technology Transfer

Cooperation with the private sector (e.g. production and application of climate-friendly air conditioning systems)

Example: JetWing Hotel Group in Sri Lanka

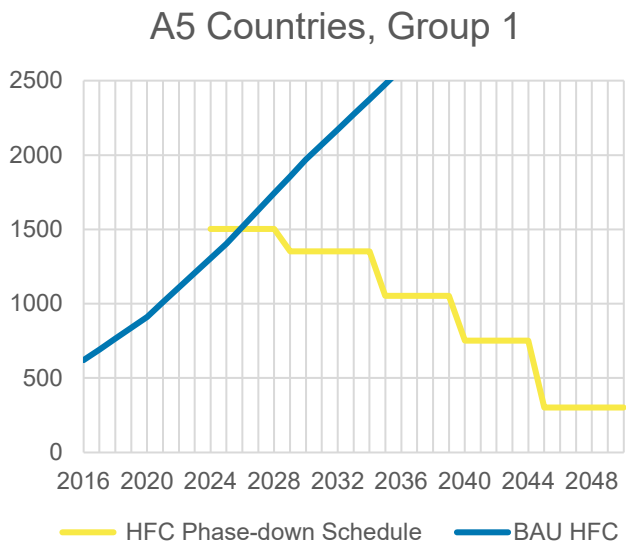
Kigali Implementation Plan: Scope and Schedule

Scope

Consumption of Substances listed under Annex F to the Montreal Protocol

Annex F Substances (Montreal Protocol)	
Group 1	
HFC-134	HFC-254ca
HFC-134a	HFC-43-10mee
HFC-245fa	HFC-32
HFC-365mfc	HFC-125
HFC-227ea	HFC-143a
HFC-236cb	HFC-41
HFC-236es	HFC-152
HFC-236fa	HFC-152a

Phase-Down schedule

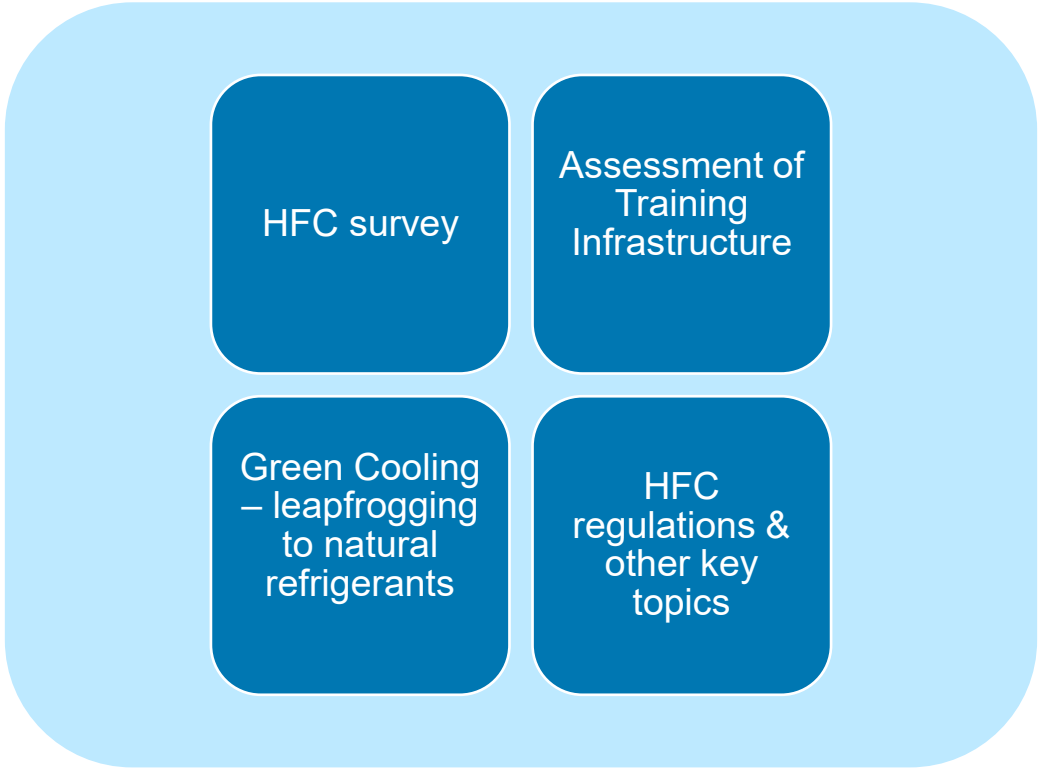


How is the KIP different?

- There are many more HFCs and HFC-blends being controlled than HCFCs
- HFCs are used in several more applications than HCFCs
- Phase-Down is different to Phase-Out
    - Sub-sector priorities have to be set
    - In several subsectors, alternatives to HFCs have low abatement cost
    - Those sectors need guidance to move first, to secure the availability of HFC for sectors where alternatives are more difficult
- Parallel implementation of HPMPs and KIP Preps / KIP Stage I

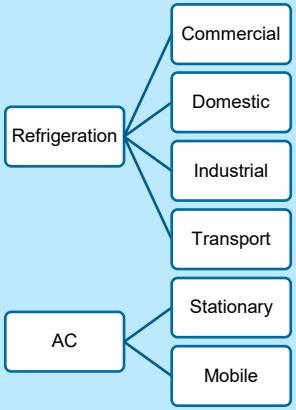
→ Enhanced complexity

Strategic Focus Approaches



Starting point: National HFC Surveys

Scope:
- Sectors which currently use HCFCs
- RAC sector but also other sectors
  - Refrigeration and AC
    - Mobile AC
    - Domestic refrigerators
  - Aerosols
  - Foam
  - Fire suppressants
  - Solvents
  - Process agents
  - Metered dose inhalers
  - Laboratory use



Data requirements
- Article 7 data
- KIP survey as basis for Implementation Plan and sectoral targets
  - The more detailed the better
  - Ideally, not a one-time exercise but a *Measurement, Reporting & Verification (MRV) System* is established
    - institutionalised data collection and analysis in regular intervals
    - simplification of reporting of sector data

Tier 2 approach because sector focus

Tier 1 (IPPC guideline)

aggregated level: RAC sector as a whole

Top-down approach

Potential emissions *(IPCC 1996)*
based on annual consumption figures

Production + Imports - Exports - Destruction

Quantifies refrigerant amounts in bulk (per substance): Data available from Article 7 reporting to the Montreal Protocol

Actual emissions *(IPCC 2006)*
Use of default emission factors to consider time lag between consumption and emissions

Tier 2 (IPCC guideline)

disaggregated level: Consumption per subsector

Bottom-up approach

Actual emissions
based on appliance-specific refrigerant charge, lifetime, emission factors

Emissions from:
Container handling + Manufacture + Operations + End-of life Emissions

Usually defining

- Equipment sales & stock
- refrigerant choice & charge
- equipment lifetime
- emission factors (cooling capacity, energy efficiency, runtime)

IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 3 (IPCC 2006)

KIP survey data needs

Tier 1

Production, Import and Export of bulk substances

- Based on custom data
- Recommended to report blends as blends and only convert to pure substance shares in the very last step
- Recommended to include HCFC data in the survey to keep still ongoing conversions in the picture
- Recommended to include HFOs and other alternatives in the survey
- Imports/exports in pre-charged equipment is not included in Tier 1

Tier 2

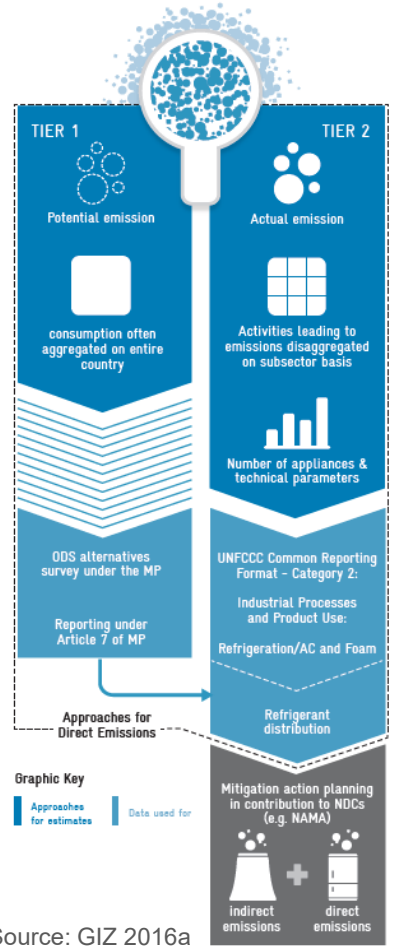
Consumption per subsector

- For RAC subsector one level further to application level
- Substance amount or number of equipment sold/in use
- Requires comprehensive data collection (with relevant authorities, manufacturers, distributers, servicing companies, etc.)

Tier 3

Large consumers need to be identified and assessed individually

- Consumption per using entity (manufacturers and other large users)
- Data required for deciding on manufacture conversion and other measures to reduce consumption

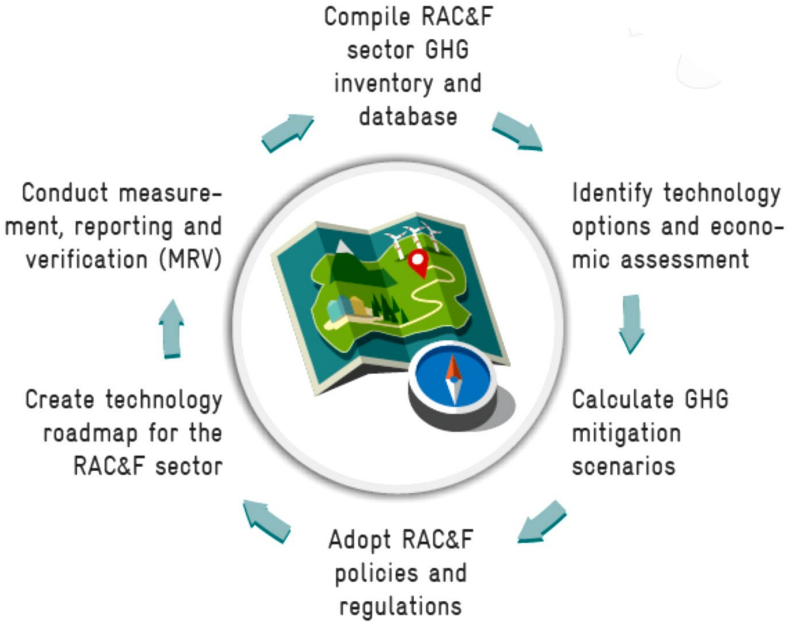


Source: GIZ 2016a

HFC surveys as solid data basis for political decision-making

HFC survey

- To asses status quo
- To identify priority sectors and first movers sectors
- To support political decision making processes



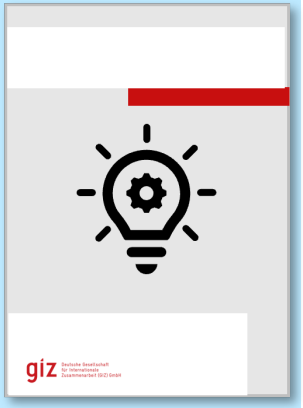
(GIZ Proklima, 2017)

Coming up: KIP Tool

KIP survey data is the basis

Features:

- Overview of the current status
  - Total consumption
  - Consumption per subsector
  - Plausibility check
- Outlook on unconstrainted growth
- Outlook on sectoral consumption
- Basis for sectoral planning of phase-down
- Summary on overall mitigation

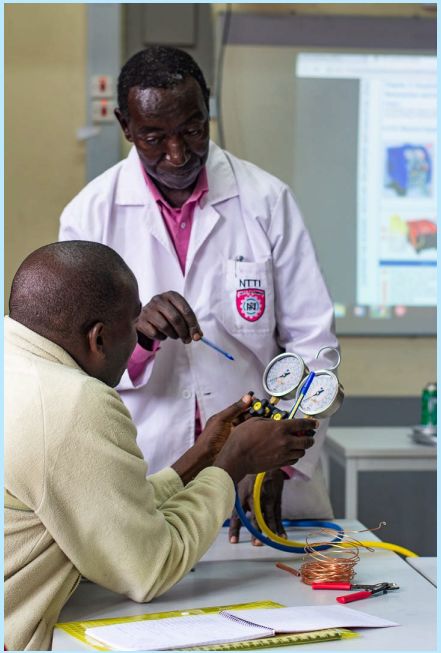


Strategic focus approach: Training Infrastructure

- **Assessment of needs**
  - What is the current status and infrastructure?
  - What is / was implemented under HPMPs (and other programs)?
  - Where are potential gaps?

- **Institutionalization of a Qualification, Certification and Registration scheme**
  - “Fit for Green Cooling” as GIZ approach
  - Focus on certification

- **Special Training needs foreseeable**
  - For natural refrigerants
  - For blends
  - Leak prevention
  - Skilled technicians are required for safe use of HFC alternatives



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Strategic Focus Approach: “Leapfrogging” to Green Cooling

Concept of Green Cooling:

- Natural refrigerants
- Highly energy efficient appliances
- Ideally powered by renewable energy sources

Instant switch to Green Cooling

- Avoid another conversion to interim technologies
- Avoid the lock-in of large amounts of HFC banks
- Technology options for natural refrigerants available for all RAC subsectors
- Facilitate enabling environment for natural refrigerants, e. g. safety standards

Additional key topics & strategic considerations

- Extension/ development of legislation and regulations to include HFCs
  - To allow enforcement of licensing and quota system for monitoring HFC import/export
- Policy measures to limit growth & incentivize (early) HFC Phase-Down (benefits or penalties - e. g. tax exemptions, staggered levy system, green public procurement, bans, etc.)
- Recycling & Reclaim
- Energy efficiency
- Include HFC banks management measures, if applicable / relevant
- Demonstration projects
- Innovative technologies / approaches (smart leak management, centralized colling, cooling over distance, etc.)
- Link to NDCs – inventory also supports reporting under UNFCCC
- Gender: strategic integration of gender considerations and support to train more female technicians, particularly in the servicing sector

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Green Cooling Website: www.green-cooling-initiative.org

www.giz.de

https://twitter.com/giz_gmbh

https://www.facebook.com/gizprofile/

Strategies and Approaches for KIPs

Kasper Koefoed-Hansen, UNDP

Content

- *KIP PRP guidelines*
- *HFC Quota System*
- *RAC servicing in the past and now*
- *Market uptake and transformation*
- *Energy Efficiency*
- *Conclusions*

KIP PRP guidelines

Decision 87/50, (g)

To request bilateral and implementing agencies, **when submitting stage I of the KIPs** on behalf of Article 5 countries, to include:

(i) Confirmation that the country had an established and enforceable national system of licensing and **quotas** for monitoring HFC imports/exports in place, consistent with decision 63/17;

(ii) The Government's commitment and actions to ensure that funded HFC phase-out would be sustained over time;

(iii) An overview of any early actions to control HFC consumption;

HFC Quota system

CO2-eq

Multiple HFCs

Market concen-tration

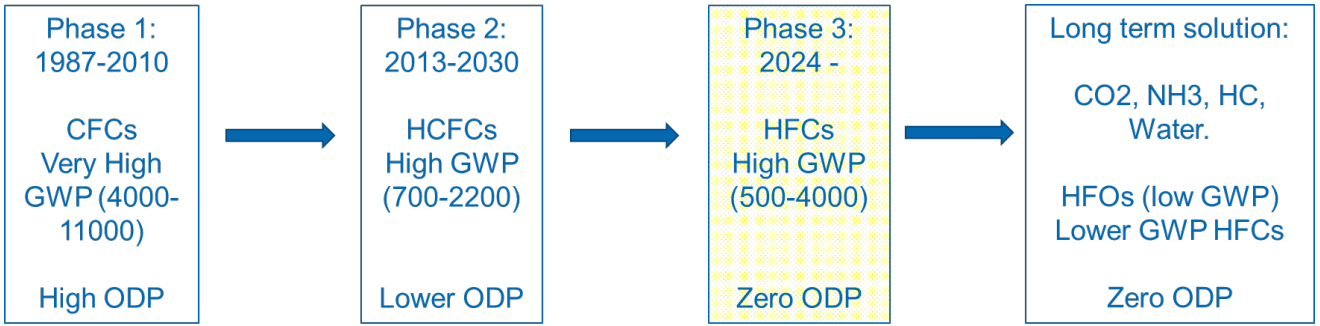
Lower GWP HFCs

HFC Phase down

=> Need for a flexible HFC quota system!

RAC servicing in the past and future

HCFC Phase Out
vs
HFC Phase Down



Market uptake and transformation

Existing stock of HFC based equipment determine future demand for HFCs for RAC servicing.

Urgent need to promote market transformation towards low GWP alternatives, through:

- Demonstration projects in all A5 countries.
- Special focus on local assembly and installation sector and to strengthen the supply chain.
- End-user programmes to stimulate the market uptake of RAC equipment with natural refrigerants.
- Increased awareness on EE benefits from RAC equipment with Natural Refrigerants.
- Support national strategies to replace old energy inefficient RAC equipment with new technologies based on non-controlled refrigerants with better EE
- MEPS
- Early bans of HFC containing equipment in certain sectors
- Etc.

Energy Efficiency

- Energy Efficiency is an integral part of the transition towards low-GWP alternatives
- Develop National Action Cooling Plans
- Access international climate finance (GEF, GCF, development banks, etc.) to support transformation (District Cooling, etc.)
- Linked with National Policies and NDCs.

Conclusions

- Flexible HFC quota system
- HCFC Phaseout ≠ HFC Phase down
- Have conditions in place for a safe transition to natural refrigerants (HC, NH3 and CO2)
- Urgent focus on actions to stimulate market uptake of Natural refrigerants through demonstration projects, end-user and early retirement programmes, MEPS, etc.
- Prioritize Local Assembly and Installation sector
- Energy Efficiency for market transformation


UN
DP

Controlling HFCs in the EU

Side event: Innovative approaches for the implementation of the Kigali Amendment

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Achieving reductions of HFC consumption

➢ Avoid losses (“refrigerant management”)

- *Emission prevention measures by operators (repair leaks, prohibit intentional releases, take measures to prevent leakages,..)*
- *Regular leak controls/checks for equipment*
- *Training and Certification of technicians*
- *Labelling and record keeping of F-gas equipment…*

➢ Reduce the use

- ***Prohibitions/Restrictions** of placing on the market (e.g. import) and use*
- *Phase-down of HFC supply to the market (via a **quota system**)*

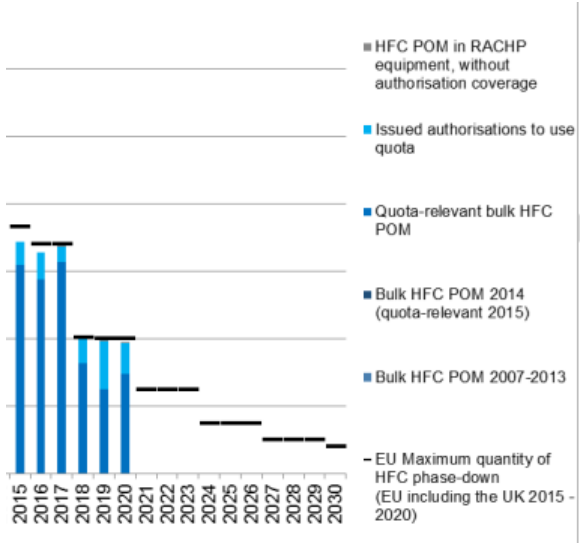
EU policies on F-gases – short history

- 2006 **First F-gas Regulation**
  - Focus on **containing F-gases ("refrigerant management")**
  - Some prohibitions (e.g. one-way cylinders, windows/short shoes/wheels, mono-component foams, some aerosol uses,..)
- 2007 **MAC Directive** (use refrigerant with GWP<150 in AC of passenger cars, from 2011+ for new types, 2017+ for all new cars)
- 2014 **Second F-gas Regulation** (HFC quota system and some accompanying prohibitions)

  → 2016 **Kigali Amendment**
- 2022 **Proposal for a Third F-gas Regulation**

Main Policy Driver: Quota System

Upstream Market Measure: Reduce HFCs (in CO2eq.!) in 3 year steps by 80% (2030)



- Importers or producers of HFCs (bulk!) need **HFC quota**, declining over time
- All HFCs in **pre-charged RACHP equipment** under quota system

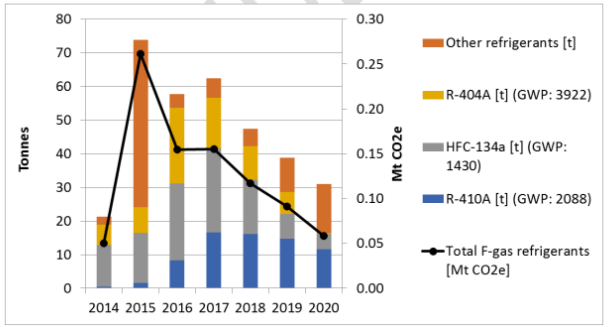
EU introduced these rules early (2014!): **Need for technology push** where alternatives not yet readily available → phase-down was a suitable tool

Today many more technical options are already available → prohibitions are more easily designed appropriately

European Commission

Prohibitions

Figure 3.14 Imports of commercial and industrial refrigeration equipment containing F-gases



i.e. phase-out in some sectors by a certain date

- **New equipment**: Prohibitions per sector/date/GWP (e.g. 2020, Refrigerant > 2500 not allowed in stationary refrigeration)
- Prohibition to service **existing (larger) refrigeration equipment** with refrigerant > 2500 from 2020 (R404A/507!)

A prohibition makes sense when safe, efficient and economical alternatives are available

→ No more need for R404A in refrigeration and R410A in AC today

Low hanging fruit (<150 GWP):

- ***Domestic fridges***
- ***Commercial sector (supermarkets): plug-ins, large multi-packs,..***
- ***AC: Plug-ins, small splits***
- ***Most aerosols, foams, fire protection***

Impacts of the 2014 F-gas Regulation

A few examples:

- **Demand** (CO2 e) of F-gas dropped

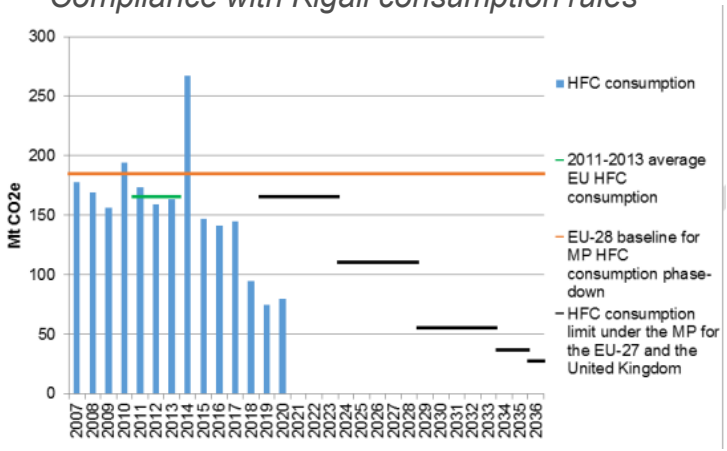
from 2015 to 2019 (-13%), for HFCs this is -47%!

- **GWP of HFCs** supplied to the EU market

has dropped from 2000 (2015) to 1600 (2019)

- GWP in **imported equipment** has dropped by 33%
- 62% reduction of emissions in the refrigeration sector
- Tripling the amounts of **reclaimed F-gases**
- Evidence that **leakage rates** have declined further (PL, DE, SK, …)

Compliance with Kigali consumption rules



European Commission

Some recommendations

- **Early implementation** avoids the creation of banks and servicing needs
- **Prohibitions** reduce consumption quickly (upstream), today feasible in many areas to eliminate HFCs, or at least reduce GWP significantly
  - *R404A/R507A and R410A are obsolete today!*
  - *One-way cylinders should be banned!*
  - *New standards in refrigeration and air conditioning allow safe use of many alternatives*
- Alongside, **monetary measures** could be considered (tax, phase-down,..), *the quota system can drive innovation in areas where not the whole sector can be covered with alternatives right away*
- Good policy requires: - **Effective licensing systems (digitization)**
  - **Good reporting systems**
  - **Qualified service personnel**
  - End-of-life treatment & Leackage Prevention, Effective penalties, Labelling

European Commission

Thank you

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

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European Commission

Closing

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