

How to Incentivize the HFC Phase-Down?

GIZ Proklima | 28 October 2021

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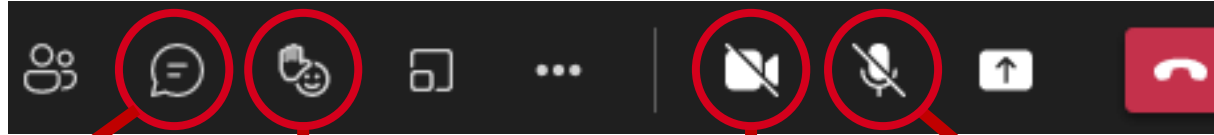
On behalf of



Federal Ministry
for Economic Cooperation
and Development

Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety

Ground Rules for Online Sessions



Use the chat for your questions.

You can use this feature for reactions or for raising your virtual hand.

If the connection allows it, please turn on your video when you speak

For best audio quality, please stay muted.

- Please **use headphones** or **earphones** in order to prevent echoing-effects



Agenda

Time [CET]	Topic	Speaker
11:00 – 11:10	Welcome Remarks	Dr. Claudia Hiepe , German Federal Ministry for Economic Cooperation and Development
11:10 – 11:20	How to Incentivize HFC Phase-Down – An Overview	Irene Papst , HEAT GmbH
11:20 – 11:30	Questions & Answers	All participants
11:30 – 11:40	Country Examples	Irene Papst , HEAT GmbH
11:40 – 11:55	Discussion	All participants
11:55 – 12:00	Conclusion and Closing Words	Bernhard Siegele , GIZ Proklima



Providing Incentives for National HFC Phase-Down

Irene Papst, HEAT GmbH

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Agenda

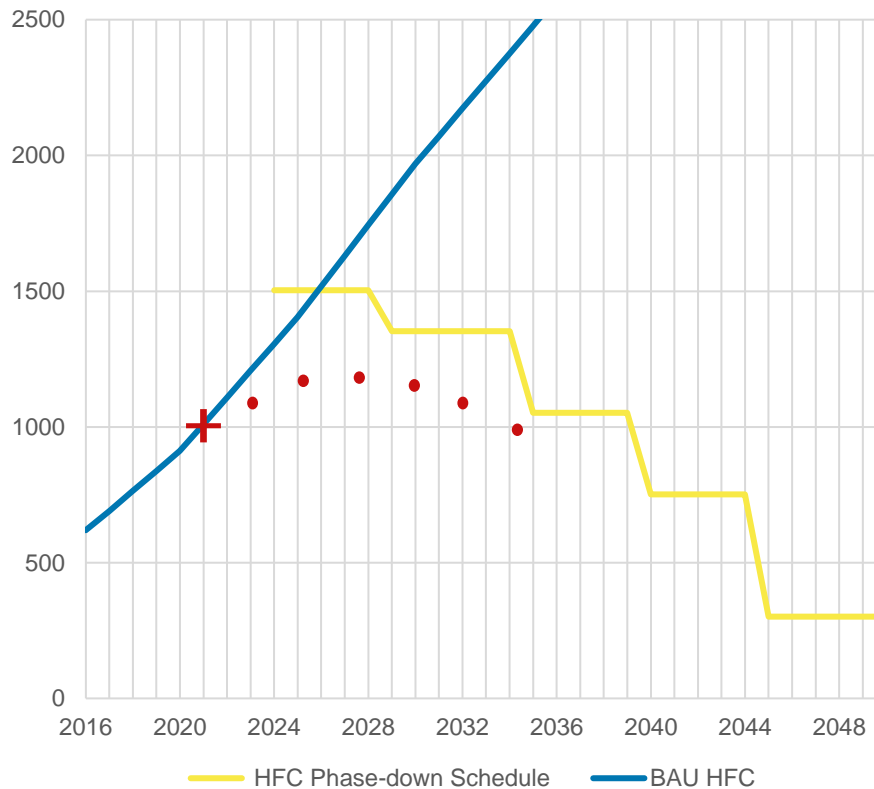
1. Why are national incentives for HFC phase-down a good idea?
2. How to incentivize HFC Phase-Down?
3. Overview on incentives for HFC Phase-Down
4. Country Examples

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Why incentivize HFC phase-down?

- The Kigali Amendment to the Montreal Protocol on the HFC Phase-down for A5 countries legally starts in 2024 (2028 for group 2).
- However, the large HCFC-part of the baseline provides room for no-action
- Why not start earlier?



Benefits for an earlier HFC phase-down



- Avoid yet another conversion to another substance group
- Avoid the lock-in of large amounts of HFC banks
- Favourable policy combination with the promotion of energy efficiency
- Achieve progress with GHG emission reduction – inclusion in Nationally Determined Contributions (NDC)
- Due to the high GWP, the cost per t CO₂eq is low
- Phase-down is different to Phase-out:
 - In several subsectors, alternatives to HFCs have low or even negative abatement cost
 - Those sectors need guidance to move first, to secure the availability of HFC for sectors where alternatives are more difficult

How to incentivize HFC phase-down?

Pull: Provide benefits for HFC alternatives

- Tax exemption on the import of alternatives, particular natural refrigerants, with substantially lower end-of-life treatment costs
- Lower Minimum Energy Performance Standards for equipment using alternatives
- Additional installation incentives (grants) for HFC alternatives with high EE
- Green Public Procurement:
Phase I - price bonus of bids with HFC alternatives making the use of alternatives
Phase II - excluding HFCs
- Explore market mechanisms under Art. 6 of the Paris Agreement for areas with added environmental benefits, i.e. combined take back and replacement of appliances, transition to natural refrigerants with high EE, proper end-of-life treatment of old appliances

How to incentivize HFC Phase-down?

Push: penalty for using HFCs

- Ban of certain refrigerants (or GWP thresholds) in selected applications where alternatives are available
- Cap and trade of HFCs (for larger countries)
- Tax on imports (bulk and for refrigerants in appliances, GWP-weighted)
- Additional end-of-life surcharge for synthetic refrigerants for higher end-of-life treatment costs
- Tax refund on return of recovered HFCs
- Mandatory documentation of HFC use on equipment level
- Mandatory leak tightness checks on equipment containing HFCs
- Develop taxonomy with public and private banks to ban HFCs where alternatives are available from (concessional) financing

Supporting framework conditions (skills)



- HFCs should not escape to the environment to prevent global warming and the accumulation of break-down products in the ecosphere
- Alternatives are often flammable or need special technology for safe use

➔ Skilled technicians are required

➔ Qualification, Certification and Registration (QCR) schemes for technicians is essential for the implementation of any incentive

➔ Suitable standards that provide reasonable guidance for the safe use of flammable refrigerants

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One size fits all?

Different country circumstances require different incentives

- **HFC producing countries:** additional benefits for local producers and manufacturers for fast-track transition to low GWP alternatives
- **Appliance manufacturing countries:** additional benefits for local manufacturers for fast-track transition to low GWP alternatives; allow end-user grants and GPP only for low GWP alternatives, natural refrigerants
- **Importing only countries:** Strong incentives for fast tracking to low GWP, natural refrigerants and appliances with high energy efficiency
- **Importing only, low volume** consuming countries – provide simple incentives, which are easy enough to understand and can be tracked easily



Selected criteria for possible incentives

- **Complexity**

- Administrative burden for implementation and market surveillance
- Measures against fraud (i.e. border control against illegal trade, unique barcode ID for each appliance with paid import taxes, check at sales points)
- Higher complexity incentives for countries with higher implementing capacities

- **Market-based approach**

- Technology-open?
- Price-incentive for desirable investment/behaviour decision?

- **Market guidance**

- Long-term consequences of today's investment decision are clear and favour the use of alternatives
- Applications where alternatives exist have clear incentive to move towards alternative
- Policy measures can be communicated in a clear manner

Pros and Cons

		Complexity	Market-based approach	Market guidance
Push	Tax exemption on the import of alternatives	low	no	low
	Lower Minimum Energy Performance Standards for equipment using alternatives	low	no	low
	Subsidy for installation of equipment using alternatives	low	no	low
	Higher subsidy for installation if combining high EE with low GWP refrigerant	low	no	low
	Green Public Procurement, making the use of alternatives a criteria	low	no	medium
	Explore market mechanisms under Art. 6 of the Paris Agreement	medium	yes	depends on mechanism
Pull	Ban of certain refrigerants (or GWP thresholds) in selected applications	low	no	high, in affected application
	Cap and trade	high	yes	medium
	Tax on import (GWP weighted)	medium	yes	high
	Tax refund on return of recovered HFCs	medium - high	yes	high
	Mandatory documentation of HFC use on equipment level	high	no	medium
	Mandatory leak tightness checks on equipment containing HFCs	high	no	medium

Suitability of incentives depend on implementation capacities

			Complexity	Market-based approach	Market guidance
Countries with lower implementing capacities	Countries with higher implementing capacities	Tax exemption on the import of alternatives	low	no	low
		Lower Minimum Energy Performance Standards for equipment using alternatives	low	no	low
		Subsidy for installation of equipment using alternatives	low	no	low
		Higher subsidy for installation if combining high EE with low GWP refrigerant	low	no	low
		Ban of certain refrigerants (or GWP thresholds) in selected applications	low	no	high, in affected application
		Tax on import (GWP weighted)	medium	yes	high
		Explore market mechanisms under Art. 6 of the Paris Agreement	medium	yes	depends on mechanism
		Tax refund on return of recovered HFCs	medium - high	yes	high
		Mandatory documentation of HFC use on equipment level	high	no	medium
		Mandatory leak tightness checks on equipment containing HFCs	high	no	medium
*	Cap and trade	high	yes	medium	

*Cap and trade schemes only advisable for large countries or groups of countries.

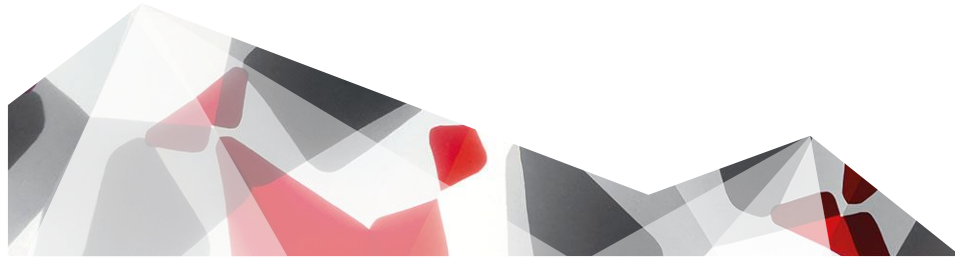
Questions?



And a question for you:

Can you name countries that have implemented incentives for the HFC phase-down?

If possible, please also indicate what kind of incentive they have.

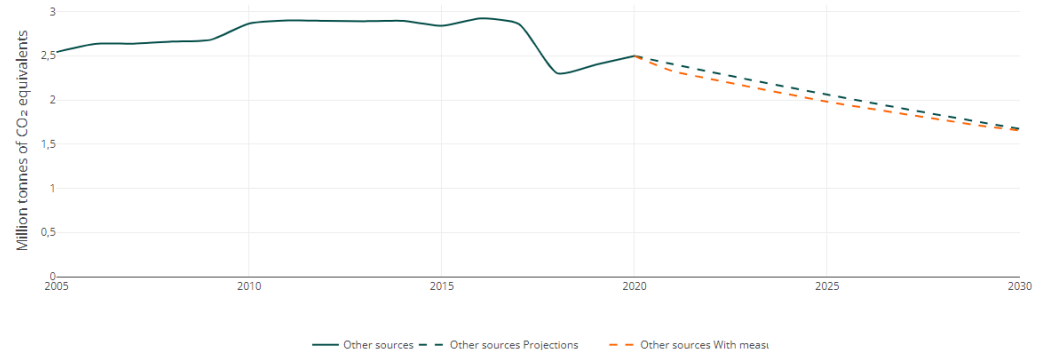


Example: Norway's HFC tax



- Introduced in 2002, step-wise increase of GWP-weighted tax on HFCs and PFCs
- Currently 6 Euro-cents per kg CO₂eq
- Refund for returned (used) HFCs

	GWP (FAR)	NOK /kg	EUR /kg	USD /kg
R32	675	399	41	48
R134a	1430	845	87	101
R404A	3922	2318	239	277
R407C	1774	1048	108	125
R410A	2088	1234	127	148



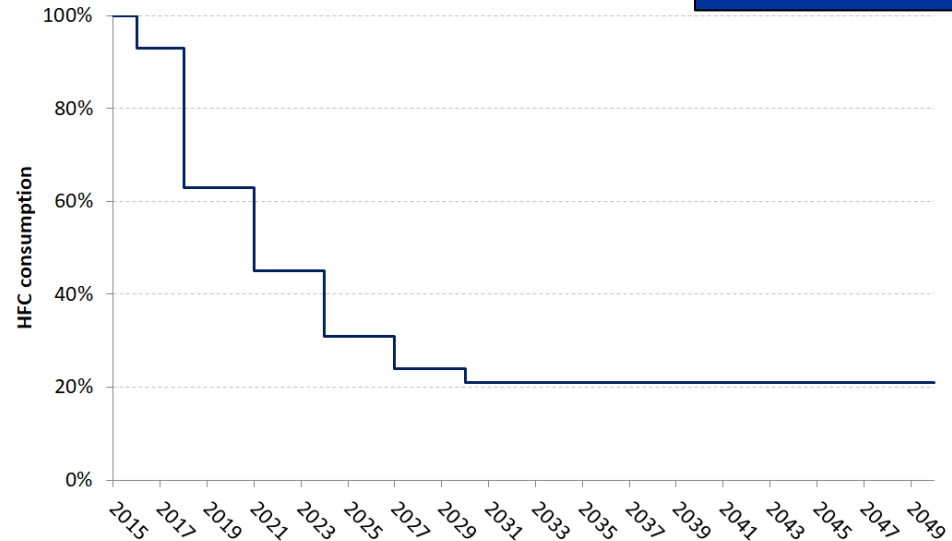
Example: European Union's Cap and Trade system



Gradual phase-down steps for placing on the market of F-gases

Implementation via quotas:

- allocated annually to producers and importers of bulk gases, which allow them to place limited HFC quantities on the EU market.
- Included in the quota are bulk HFCs as well as HFCs contained in pre-charged RAC&HP equipment and in pre-blended polyols.



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Example: European Union's Cap and Trade system (2)



The quota system is supported by several bans for selected applications. For example, upcoming bans are:

Date	Products and Equipment
1 January 2022	Commercial refrigerators and freezers containing HFCs with GWP \geq 150
1 January 2022	Commercial multipack centralised refrigeration systems with a capacity of 40 kW or more, containing HFCs with GWP \geq 150
1 January 2023	Other foams containing HFCs with GWP \geq 150 (also concerns appliance foams)
1 January 2025	Single split air-conditioning systems containing < 3 kg F-gases containing or with functioning relying upon F-gases with GWP \geq 750

Example: EU Eco-design



Requirements for minimum energy efficiency

	Air conditioners, except double and single duct air conditioners		Double duct air conditioners		Single duct air conditioners	
	SEER	SCOP (heating season: Average)	EER _{rated}	COP _{rated}	EER _{rated}	COP _{rated}
If GWP of refrigerant > 150 for < 6 kW	4,60	3,80	2,60	2,60	2,60	2,04
If GWP of refrigerant ≤ 150 for < 6 kW	4,14	3,42	2,34	2,34	2,34	1,84
If GWP of refrigerant > 150 for 6-12 kW	4,30	3,80	2,60	2,60	2,60	2,04
If GWP of refrigerant ≤ 150 for 6-12 kW	3,87	3,42	2,34	2,34	2,34	1,84

(EU) No 206/2012

Scope:

- Electric mains-operated air conditioners with a rated capacity of ≤ 12 kW for cooling, or heating if the product has no cooling function
- comfort fans with an electric fan power input ≤ 125W

Example: Germany's BAFA subsidies

For companies who install or refurbish their refrigeration and AC equipment

- using **non-halogenated refrigerants** (i.e. hydrocarbons, CO₂, Ammonia, etc.)
AND
- are designed for **energy efficiency**, such as
 - Capacity control (control range of 40 to 100 %)
 - Defrosting with demand control
 - Cabinets equipped with doors or night cover for dairy and meat products
 - LED lighting
 - Components adhere to Eco-Design Directive
 - Energy monitoring for at least 5 years

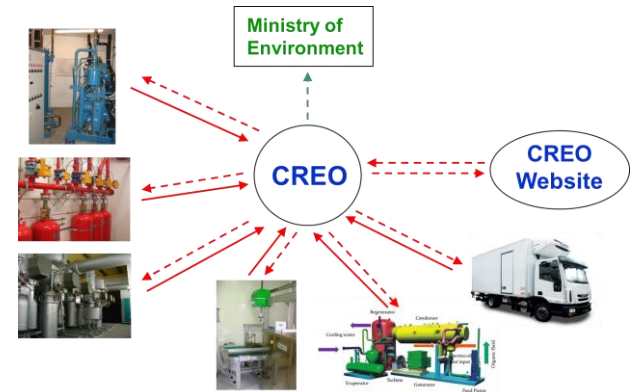


Example: Poland's database on HFC containing equipment



For the implementation of provisions for equipment operators contained in the EU F-gas Regulation, the Polish government set up a **Central Registration of Equipment Operators (CREO)**.

- Electronically operated centralized system for „Equipment Logbooks” required for equipment containing F-gases (5 tons of CO₂eq+) and ODS (3 kg+)
- Contact data of the operator
- Detailed type of stationary equipment
- Quantity and type of F-gas (or ODS) contained in the equipment and quantities of F-gas (or ODS) recovered or added during maintenance or servicing
- Description of and dates of activities conducted
 - installation
 - maintenance or servicing, repair,
 - leakage checking, leakage repair, installation of leakage detection system
 - recovery, decommissioning
 - name and certificate number of company and technician



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Example: Poland's database on HFC containing equipment (2)



- Over 45 000 operators
 - Around 240 000 RAC&HP equipment
 - Around 20 000 electrical switchgear equipment and fire protection equipment
 - Equipment operators are reminded automatically, if a leak checking interval is exceeded
 - Fines for non-compliance
 - List of non-compliant operators is shared with environmental inspection authorities
 - High initial effort to get all equipment operators registered
 - Personnel required to quality-check logbooks
- If well maintained, excellent way of enforcing leak tightness and documentation provisions

Example Seychelles: Staggered environmental levy scheme and tax exemptions depending on GWP



GWP	Levy (% of the total value of refrigerant cylinder and equipment)	VAT
Below 100:	0%	Refrigerants are VAT exempted. RAC equipment with EE documentation is also VAT exempted.
100-1999:	5%	15%
2000-2999:	8%	15%
above 3000:	10 %	15%

- For all refrigerants and RAC equipment imported into the country
- In effect since February 2021
- Implemented as amendment to the ODS regulation

Example: Thailand's support for manufacturers switching to natural refrigerants

The RAC NAMA Thailand supported Thai producers to address technology trends and increase their competitiveness by engineering support for

- production line conversion to using natural refrigerants
- product development with safe use of natural refrigerants
- safety and high energy efficiency design

The focus is on

- Commercial plug-in devices (bottle coolers, ice-cream freezers)
- Split ACs
- Mini-Chiller



Conclusion



- HFCs are low hanging fruits for GHG emission reductions



- Measures on refrigerants can be combined with energy efficiency promotion of refrigeration and AC equipment



- Any of the presented measures could be part of Nationally Determined Contributions (NCDs)

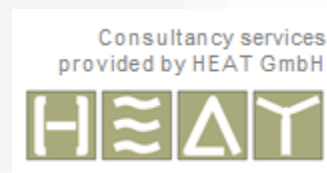


- The more ambitious the target, the higher the chance for international financing

Thank you for your kind attention!

Irene Papst

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Thank you for your participation!



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