



eurammon Symposium 2017

***Legal Framework Conditions for
the Use of Natural Refrigerants in
Switzerland***

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Chemical Risk Reduction Ordinance (ORRChem)

Annex 2.10: Refrigerants

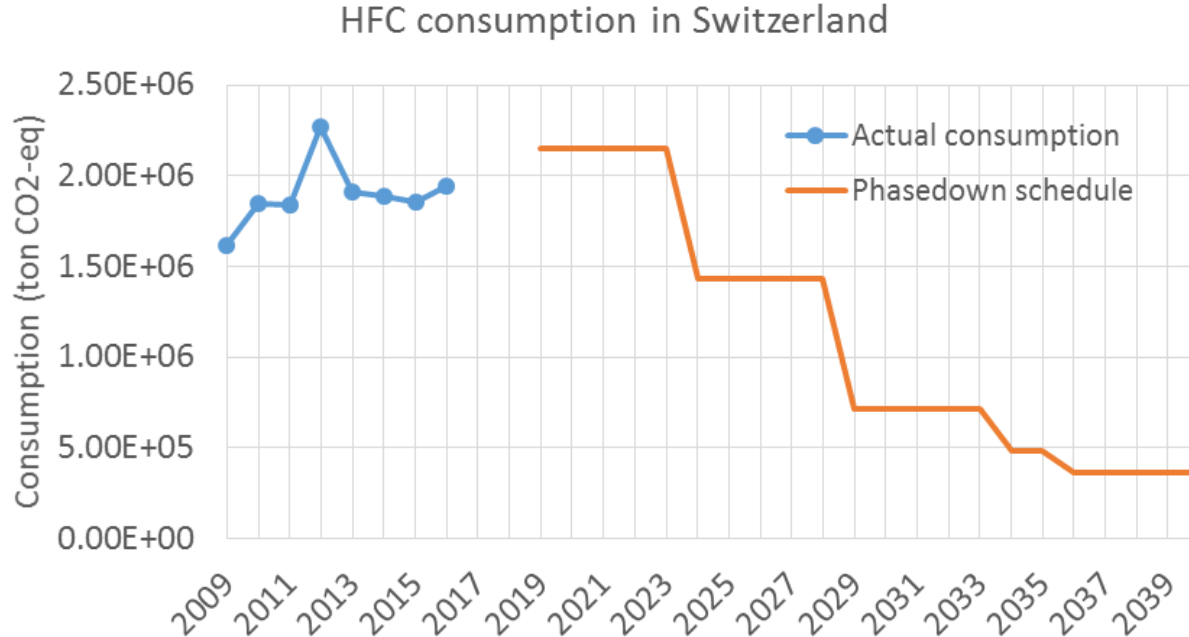
- Last major adjustments: 2013
 - Prohibition of stationary systems with refrigerants stable in the atmosphere (mostly HFC) that exceed certain application-specific cooling capacities Q_0
 - Limited refrigerant charges for systems with air-cooled condensers
- Planned next major adjustments: 2019

Current legal bases in Switzerland

- Enforcement aid: Refrigerants (new edition 2017)
 - Definitions, specifications
 - Explanations to the prohibitions currently in force
- Enforcement aid: Maintenance log (new edition 2017 / 18)
- Recommendations on energy efficiency
 - SIA 382/1:2014
 - Campaign Efficient Cooling (FOE)
<https://www.energieschweiz.ch/page/de-ch/effiziente-kaelte>

Adjustments to the ORRChem

- Important developments in the state of technology
- Kigali Amendment of the Montreal Protocol



→ Revision of ORRChem Annex 2.10

Determining the state of the technology for stationary systems

- Revision of ORRChem Annex 2.10
 - working group on the state of the technology, consisting of
 - Federal and Cantonal authorities
 - representatives of inter-trade organizations (SVK, ASF, FWS, Proclima, Suissetec)
 - experts in the field
 - public consultation of the modified ORRChem in spring / summer 2018
 - planned entry into force in spring 2019

Regulation of comfort climatisation and heat pumps

Comfort air conditioning systems and heat pumps [functioning max. 8 months/year]

GWP < 1900	permitted	air-cooled not permitted if refrigerant charge >0.4 kg/kW or >0.48 kg/kW with WHR	not permitted*
GWP > 1900	permitted	air-cooled not permitted if refrigerant charge >0.18 kg/kW or >0.22 kg/kW with WHR	not permitted*
	$Q_0 \leq 100 \text{ kW}$	$100 \text{ kW} < Q_0 \leq 600 \text{ kW}$	$Q_0 > 600 \text{ kW}$

Air conditioning systems with VRV-VRF (heating and cooling)

permitted	not permitted*
$Q_0 \leq 80 \text{ kW}$ and EU ≤ 40	$Q_0 > 80 \text{ kW}$ or EU > 40

EU = Evaporator units
WHR = Waste Heat Recovery

 values under revision

* Exemptions can be requested at FOEN, if the applicable norms SN EN 378-1, -2 und -3 cannot be respected with refrigerants not stable in the atmosphere.

Regulation of commercial refrigeration systems

Commercial refrigeration systems

medium temperature cooling

GWP < 2500	permitted	not permitted*
GWP > 2500		not permitted*
$Q_0 \leq 40 \text{ kW}$		$Q_0 > 40 \text{ kW}$

low temperature cooling

permitted	not permitted*
$Q_0 \leq 30 \text{ kW}$	$Q_0 > 30 \text{ kW}$

low temperature cooling, if it can be combined with medium temperature cooling

permitted	not permitted*
$Q_0 \leq 8 \text{ kW}$	$Q_0 > 8 \text{ kW}$

 values under revision

Regulation of industrial cooling systems and heat pumps

Industrial refrigeration systems (incl. air conditioning und heatpumps)

medium temperature, ice water cooling, coolant, cold water cooling

GWP < 1900	permitted	air-cooled not permitted if refrigerant charge >0.4 kg/kW or >0.48 kg/kW with WHR	not permitted*
GWP > 1900	permitted	air-cooled not permitted if refrigerant charge >0.18 kg/kW or >0.22 kg/kW with WHR	not permitted*
	$Q_0 \leq 100 \text{ kW}$	$100 \text{ kW} < Q_0 \leq 400 \text{ kW}$	$Q_0 > 400 \text{ kW}$

deep-freezing, froster

permitted	not permitted*
$Q_0 \leq 100 \text{ kW}$	$Q_0 > 100 \text{ kW}$

 values under revision

Reduction of the quantity of refrigerants in stationary systems

All applications (air conditioning, commercial cooling, industrial cooling)

air-cooled

GWP > 4000	air-cooled condenser not permitted	
	$Q_0 > 0 \text{ kW}$	

direct evaporation

permitted	direct evaporation not permitted, secondary circuit required	
$Q_0 \leq 80 \text{ kW}$ or AC < 3	$Q_0 > 80 \text{ kW}$ and AC ≥ 3	

Polyvalent systems [heating and cooling simultanously] with ≥ 2 air heat exchanger

GWP > 1900	permitted	air-cooled not permitted if refrigerant charge > 0.37 kg/kW	not permitted*
	$Q_0 \leq 100 \text{ kW}$	$100 \text{ kW} < Q_0 \leq 600 \text{ kW}$	$Q_0 > 600 \text{ kW}$

AC = Air cooler

 values under revision

Determining the state of the technology for stationary systems

Further restricting the use of systems with HFC requires information on the state of alternative technologies that are available on the market!

Non-restricted applications

- Appliances for commercial cooling
- Cooling in the transportation sector
- Heat pumps in domestic appliances


new regulation under revision

Refrigerants that will continue to be unrestricted by the ORRChem

- Ammonia
- CO₂
- Hydrocarbons
- HFO
 - HFO-HFC blends are considered as refrigerants stable in the atmosphere and are regulated just like HFCs.



Thank you for your attention



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