

Refrigerants, Naturally! for LIFE

SUSTAINABLE COOLING FOR EUROPE'S SMALL FOOD RETAIL STORES

POLICY GUIDE

GUIDANCE DOCUMENT



GLOBAL



Montreal Protocol, Kyoto Protocol, Paris Agreement

EU



Direct Emissions

ODS Regulation
F-Gas Regulation

Indirect Emissions

EU Ecodesign Directive
EU Energy Label

NATIONAL



National Policies and Voluntary Approaches

CONTENT

GLOBAL POLICIES

To set a political framework for the international community to fight climate change.

EUROPEAN POLICIES

To detail out the global political framework with concrete deadlines and limits defined for Europe.

NATIONAL POLICIES

To implement the European policies through national policies and voluntary programs.

REGULATIONS

FOR THE USE OF REFRIGERATION, AIR CONDITIONING AND HEAT PUMPS (RACHP)

The refrigeration, air conditioning, and heat pump (RACHP) sector is a large consumer of energy and emitter of greenhouse gases (GHG). Global, national, and regional policies have been put in place to reduce this impact on the environment.

As RACHP appliance user, it's not only a challenge to find out which policy is applicable to you and why, but also to understand the complex language in which policies are often written. This guiding document will give you a brief overview about the most relevant policies on RACHP appliances for the food retail sector and discuss each of them in a more simplified language explaining how they can relate to you. In the first section this guide gives you a global background, the following sections address regulations that impact you directly. Finally, this guide will provide you with links if you need further information and support.

MONTREAL PROTOCOL AND KIGALI AMENDMENT

OZONE LAYER PROTECTION BY PHASING OUT CFCs

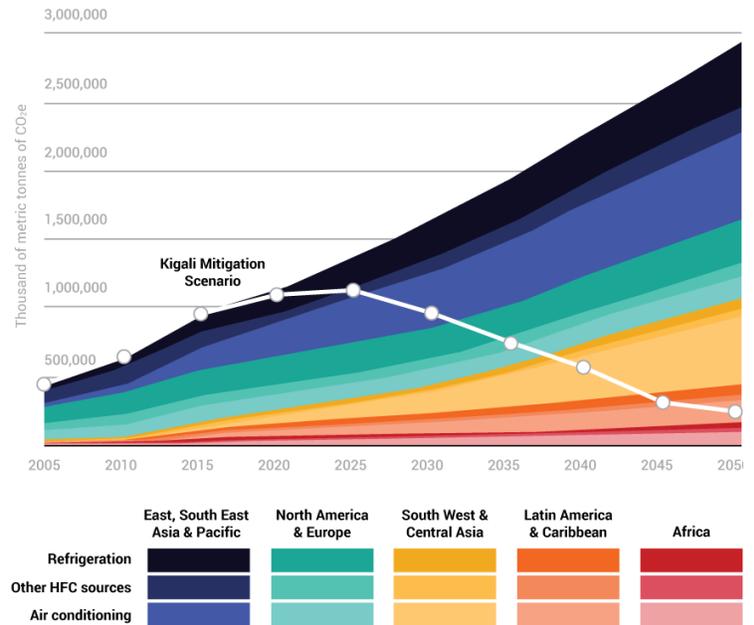
The Montreal Protocol entered into force in January 1989 and is an international treaty to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion and climate change. The most significant revision of the Montreal Protocol was the Kigali Amendment in 2016. Due to its widespread adoption and implementation the Ozone layer is starting to heal, and a recovery is expected by around 2050.

WHY IS THIS RELEVANT FOR YOU?

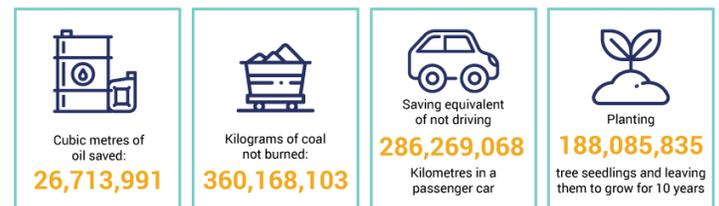
Ozone depleting substances (ODS) such as CFCs¹ were used in many appliances until they were phased out under the Montreal Protocol. The refrigerants first used to replace CFCs, the so called HCFCs², are less harmful to the ozone layer but are still very damaging to the environment and were later replaced by HFCs³ that are not harmful to the ozone layer but still cause climate change because of its global warming potential (GWP⁴). Under the Kigali Amendment those refrigerants are being phased down as well but still exist in many appliances today.

Worldwide impact of the Kigali Amendment

Evolution of HFC emissions from main sources and Kigali Amendment mitigation scenario*



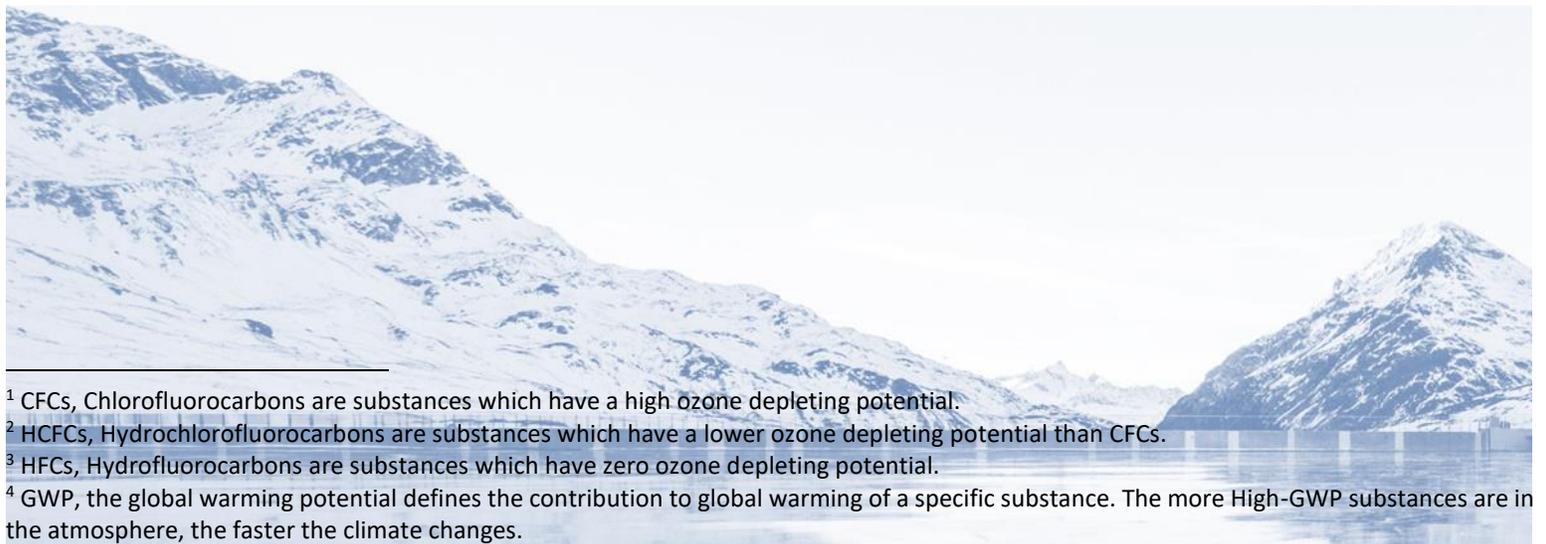
Greenhouse gas mitigation impact**



sheccoBase

FIGURE 1 WORLDWIDE IMPACT OF THE KIGALI AMENDMENT, SOURCE: SHECCOBASE

*International Institute for Applied Systems Analysis (IIASA) / Climate and Clean Air Coalition (2016-2017 Annual Report)
 **According to the European Commission, 80 billion metric tonnes of direct GHG and CO₂e emissions will be saved from Kigali between 2020 and 2050, which translates (using the U.S. Environmental Protection Agency's greenhouse gas equivalencies calculator) to the above.



¹ CFCs, Chlorofluorocarbons are substances which have a high ozone depleting potential.

² HCFCs, Hydrochlorofluorocarbons are substances which have a lower ozone depleting potential than CFCs.

³ HFCs, Hydrofluorocarbons are substances which have zero ozone depleting potential.

⁴ GWP, the global warming potential defines the contribution to global warming of a specific substance. The more High-GWP substances are in the atmosphere, the faster the climate changes.

KYOTO PROTOCOL

REDUCTION OF GREEN HOUSE GAS EMISSIONS

The Kyoto Protocol is an international legally binding treaty that entered into force in February **2005** and aims to reduce greenhouse gases (GHG) in the atmosphere, addressing global warming. In Europe, the Kyoto Protocol became the basis for the Energy Policy encouraging efforts and investment in energy efficiency technologies research and implementation as well as renewable energy deployment to meet the agreed targets.

WHY IS THIS RELEVANT FOR YOU?

Many commonly used refrigerants are GHG with a high global warming potential and you might have units with such refrigerants in your store. So, when you need to replace your next unit, look into the refrigerant and the energy efficiency of the unit. The more efficient your equipment is, the better for the environment and your energy costs. This will also future proof your equipment and help you to stay compliant.

PARIS AGREEMENT

GLOBAL WARMING BELOW 1,5°C/ 2°C

The Paris Agreement is an international treaty in force since November **2016** and signed by **197 countries**. This agreement aims to limit the global warming temperature increase to well below 1.5°C/ 2°C compared to pre-industrial levels. It is generally agreed that immediate action on GHG emissions reduction is needed to achieve the goals.

WHY IS THIS RELEVANT FOR YOU?

When you need to invest into new appliances, choose appliances with natural refrigerants and those that are highly energy efficient. This will minimize your contributions to global warming, reduce your costs, and is part of the needed action to keep the temperature increase below 1.5°C/ 2°C.



ODS REGULATION

IMPLEMENTATION OF THE MONTREAL PROTOCOL

Governments in the EU implemented regulations phasing down and then banning the use of ozone depleting substances (ODSs). The regulation includes measures with requirements to reduce the use of ODSs for applications with no alternatives and a complete ban in other cases such as in cooling and refrigeration where CFC refrigerants were replaced by substances that had a lower ozone depletion potential such as HCFCs, and ultimately by substances such as HFCs whose ozone depleting potential is zero.

TABLE 1 REFRIGERANTS WITH THEIR GWP AND ODP

Chemical Formula	Name	Code	Global Warming Potential (GWP)	Ozone Depletion Potential (ODP)
SYNTHETIC REFRIGERANTS				
CFCs	Chlorofluorocarbons		Very high	High
HCFCs ¹⁾	Hydrochlorofluorocarbons		Very high	Very low
HFCs ¹⁾	Hydrofluorocarbons		Mostly high	Zero
HFOs ^{1,2)}	Hydrofluoroolefins		Low	Zero
NATURAL REFRIGERANTS				
HCs ¹⁾	Propane, Propene, Isobutane	R290, R1270, R600a	Negligible (3,2,3)	Zero
CO ₂	Carbon dioxide	R744	Negligible (1)	Zero
NH ₃	Ammonia	R717	Zero	Zero
H ₂ O	Water	R718	Zero	Zero
O ₂	Air		Zero	Zero

1) refrigerant groups, no specific GWP or ODP mentioned due to variations within the group

2) have an environmental impact and therefore have to be reported acc. to the F-Gas Regulation

WHY IS THIS RELEVANT FOR YOU?

While a phase-out of HCFCs has been largely achieved, these regulations remain relevant for the EU to prevent markets from returning to employ them. It's therefore crucial for you to consult with a professional service provider who is well familiar with the market and its developments.

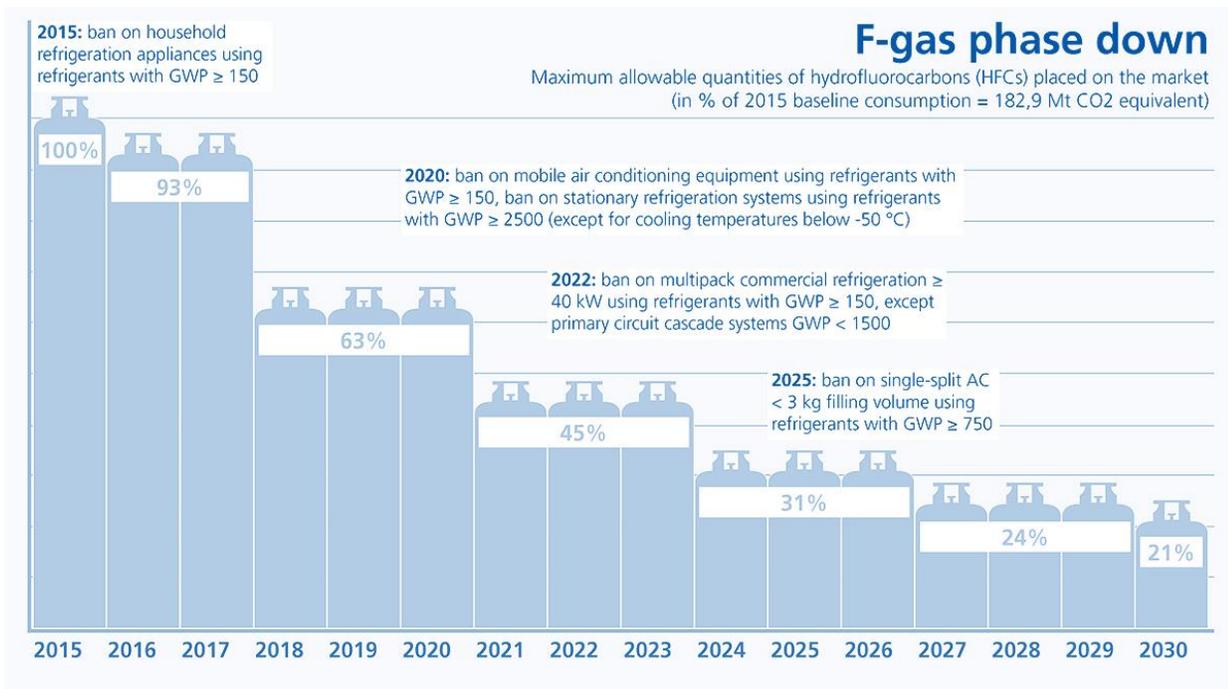


F-GAS⁵ REGULATION

PHASING DOWN HFCs

The F-gas regulation is the main legislative driver to phase down direct greenhouse gas emissions from RACHP equipment in the EU. For new **refrigeration (R)** appliances, refrigerants with a GWP > 2500 in centralized equipment such as in retail stores won't be allowed from 2020 onwards, appliances >40kW with refrigerants with a GWP > 150 are being banned in commercial refrigeration from 2022 onwards. For **air conditioning (AC)**, refrigerants such as HFCs in moveable air conditioning units with a GWP >150 will be banned from 2020 onwards, whereas split units that contain up to 3kg of refrigerant with a GWP > 750 will only be banned from 2025 onwards. For **heat pumps (HP)**, there is no clear target yet defined under the F-Gas regulation. However, to achieve the climate targets which are defined under the Paris Agreement, the industry needs to develop the application of low GWP refrigerants for heat pumps.

FIGURE 1 F-GAS PHASE DOWN ACCORDING TO THE F-GAS REGULATION, SOURCE: GEA GROUP (WWW.GEA.COM)



WHY IS THIS RELEVANT FOR YOU?

To comply to the EU regulations, you must ensure only refrigerants below the defined GWP value are used in your store equipment. The list below shows different refrigerants and their ODP as well as GWP value. It's recommended to use natural refrigerants as they have no environmental impact. If you would like to know which refrigerant is in your current equipment, have a look at the type label of your appliance or reach out to your local technical service.

⁵ F-gases are fluorinated gases which have higher global warming potentials than natural refrigerants

EU ECODESIGN DIRECTIVE

MINIMUM ENERGY EFFICIENCY STANDARDS (MEPS)

The objective of the EU Ecodesign Directive is to minimise greenhouse gas emissions in the whole life cycle of a product, from the development phase to the recycling / disposal phase. However, most of the indirect emissions are caused in the phase in which consumers use the product. Therefore, energy consumption is a key parameter to be looked at during product development. As low efficiency products are banned gradually from the EU market, producers must follow Minimum Energy Efficiency Standards (MEPS) in which minimum values for efficiencies are defined for different product groups. **Fehler! Verweisquelle konnte nicht gefunden werden.** shows MEPS for Split and Room AC globally.

WHY IS THIS RELEVANT FOR YOU?

By choosing energy efficient appliances you do not only decrease your electricity bill but also decrease your carbon emissions.

EU ENERGY LABEL

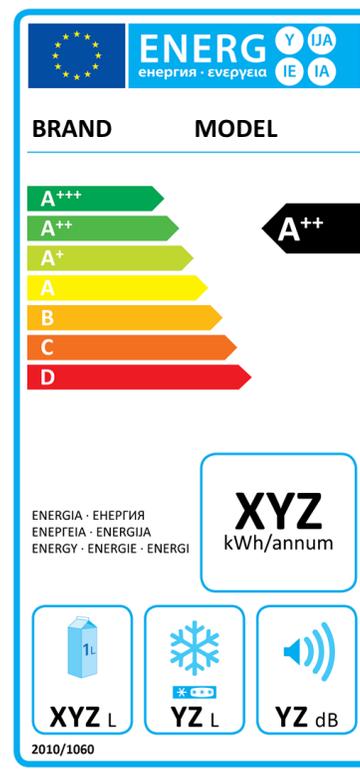
ENVIRONMENTAL INFORMATION OF YOUR APPLIANCES

This is a mandatory regulation that requires that all units in many appliance classes have the EU Energy Label. This provides information on energy consumption, noise levels, and other features of the appliance. It provides a level of comparison within the market for you to make an informed choice. The greener the rank, the lower the running costs and the more your carbon emissions go down.

WHY IS THIS RELEVANT FOR YOU?

Information on the energy efficiency of your appliance enable you, the consumer, to distinguish between efficient and less efficient products and help you in your decision-making process when investing in new equipment. Keep in mind, the more energy efficient your appliances are, the less you will have to pay for energy consumption over the equipment lifetime.

FIGURE 3 SAMPLE FRIDGE ENERGY EFFICIENCY LABEL



NATIONAL POLICIES IN GERMANY

Germany's subsidy scheme for natural refrigerant-based equipment has been extended to 2021. Various other funding programs and incentive schemes have also been put in place to progress the country's phase down of high-GWP HFCs and to promote energy efficient equipment.

DISPOSAL AT THE END OF LIFE

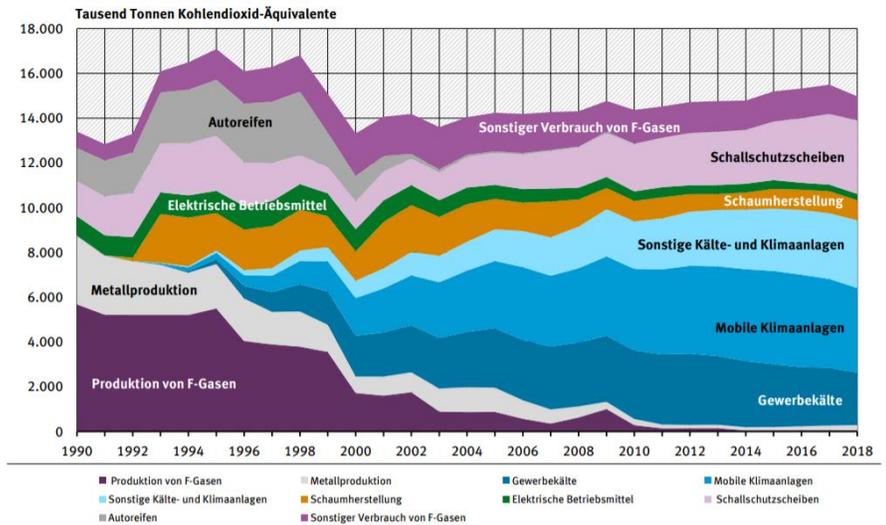
FOR APPLIANCES AND FOR RECYCLING OF F-GASES

The Chemicals Climate Protection Ordinance (*Chemikalien-Klimaschutzverordnung*) is the implementation of the EU F-Gas regulation in Germany. It defines the HFC take back and recovery for used refrigerants as mandatory, requires maintaining the records related to the recovery and destruction of F-Gases and states no incentives for operators to return the gas for processing.

FIGURE 4 QUELLEN VON F-GAS EMISSIONEN, SOURCE: UMWELTBUNDESAMT, EMISSIONSDATENBANK ZSE (STAND 01/2020)

Quellen der Emissionen fluoriierter Treibhausgase

F-Gas Emissionen differenziert nach verschiedenen Anwendungen und Produktionen



CARBON REDUCTION POLICIES

FINES RELATED TO HFCs

In Germany, HFC tax has not yet been imposed. The only fiscal measure relating to HFCs is that fines may be issued. The Chemicals Climate Protection Ordinance addresses leakage control of stationary RAC equipment, refrigerated trucks and trailers. There are limits regarding the specific loss of refrigerant from stationary equipment during the normal operating phase. Those values vary depending on the refrigerant used and the charge. It is important to note that Germany is a Federal Republic, and that each of the individual Federal States ("Länder") is responsible for its own law enforcement. Each state has its own rules and agencies which certify training in F-Gas handling. Additionally, they are responsible for applying the management of HFC recovery, reclamation and destruction into federal legislation.

WHY IS THIS RELEVANT FOR YOU?

The Chemicals Climate Protection Ordinance names offences and sanctions under § 11. Being informed about these will enable you to take action in case your technical service partner is not aware of it.



KÄLTE- UND KLIMA-RICHTLINIE (2019-2021)

RENEWAL OF THE SUBSIDY PROGRAM FOR NATURAL REFRIGERANT-BASED EQUIPMENT

The subsidy program, run by the Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU, *Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit*), started in 2008 and was prolonged from 2019 to 2021. It aims to accelerate the adoption of climate-friendly refrigeration and air-conditioning technologies and specifically supports natural refrigerants but also highly energy efficient appliances and components built in.

WHY IS THIS RELEVANT FOR YOU?

This subsidy program is offered to end users like you who purchase such climate-friendly refrigeration and air-conditioning technologies and, in particular, when natural refrigerants are used.

THE BLUE ANGEL ECOLABEL

NON-FINANCIAL INCENTIVE

The Blue Angel is an ecolabel implemented by the federal government of Germany in 1978 and requires environmentally friendly product designs. The ecolabel is applied among numerous products and product groups. Each product group has its own standard whose criteria are reviewed every four to five years. The following ecolabels include requirements for the refrigerants used, the most important being the mandatory use of halogen-free/natural refrigerants:

- DE-UZ 179 Climate-friendly grocery stores in the food retail sector
- DE-UZ 204 Stationary air conditioners



FIGURE 5 BLUE ANGEL LABEL,
SOURCE: BLAUER ENGEL

WHY IS THIS RELEVANT FOR YOU?

This is not only applicable for you when you make purchase choices for the RACHP appliances but also can become an interesting aspect of your overall sustainability strategy. Besides looking into Blue Angel certified RACHP appliances it's also worth looking into products you need to run your business and products you sell. There is a variety of other products that are environmentally friendly and Blue Angel certified.



ENERGY EFFICIENCY IN REFRIGERATION EQUIPMENT

FURTHER SUBSIDY PROGRAMS

In addition to the above-mentioned subsidy program for natural refrigerant-based equipment of the BMU, other ministries propose support programs such as the "Guideline for the Federal Promotion of Energy Efficiency and Process Heat from Renewable Energies in the Economy – Grant and Credit", proposed by the Federal Ministry for Economic Affairs and Energy (BMWi). The Federal Ministry of Food and Agriculture (BMEL) also has a subsidy program which is called "Federal Program for the Promotion of Measures to Increase Energy Efficiency in Agriculture and Horticulture". A database with all the subsidy programs can be found on the website of the Ministry for Economic Affairs and Energy.

WHY IS THIS RELEVANT FOR YOU?

There are many subsidy programs that end users like you can benefit from. For any further information on the various subsidy programs, you can find information on websites such as that of the Ministry for Economic Affairs and Energy.

CLIMATE-FRIENDLY REFRIGERATION

ONLINE PORTAL WITH INFORMATION ON APPLICATIONS, SUBSIDIES AND LEGAL ISSUES

Operators and designers of air-conditioning and refrigeration systems or heat pumps can obtain information on applications, subsidies and legal issues on the online portal "Climate-friendly refrigeration" in a supplier-neutral manner. It provides easy-to-understand explanations of environmentally friendly halogen-free alternatives including their possible applications and limitations; information on training; further training and educational opportunities; and subsidy programs. Practical examples demonstrate how to save energy and protect the climate whilst modernizing and newly constructing refrigeration, air conditioning and heat pump systems. In the expert database, operators can find competent refrigeration system planners and builders in their region. The portal was funded by the Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) as part of the National Climate Protection Initiative (NKI). A variety of similar information is provided by the HDE Klimaschutzoffensive, funded by the Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

WHY IS THIS RELEVANT FOR YOU?

There is a great deal of information to be accessed regarding climate-friendly refrigeration and its relevant applications, subsidies, and legal issues. Go on the "Climate-friendly refrigeration" online portal to find out more.

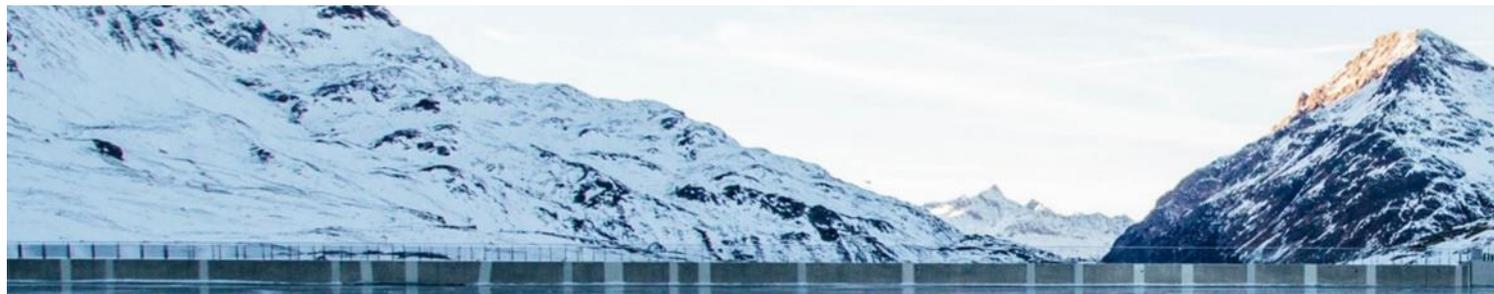


ADDITIONAL INFORMATION

LINKS TO PREVIOUS SECTIONS

Reference to	Link
Carbon reduction policies	The Chemicals Climate Protection Ordonnance
Carbon reduction policies	The Chemicals Climate Protection Ordonnance – sanctions
Kälte- und Klima-Richtlinie (2019-2021)	Subsidy program for natural refrigerant-based equipment by the Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)
Energy Efficiency in refrigeration equipment	Database for subsidies of the Federal Ministry for Economic Affairs and Energy (BMWi)
The Blue Angel Ecolabel	Blue Angel website
The Blue Angel Ecolabel	DE-UZ 179 Climate-friendly grocery stores in the food retail sector
The Blue Angel Ecolabel	DE-UZ 204 Stationary air conditioners
Climate-friendly refrigeration	Climate-friendly refrigeration online portal
Climate-friendly refrigeration	Subsidy program for climate-friendly refrigeration
Climate-friendly refrigeration	Expert data base for climate-friendly refrigeration
Climate-friendly refrigeration	Climate friendly refrigeration information portal

All links can be found on our website: www.refnat4life.eu



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