

The Climate Protection Program implements a climate protection plan with specific measures in the areas of energy, industry, transport, construction, agriculture, waste management and recycling, as well as land use, land use change and forestry. Refrigeration and air conditioning can make an important contribution to achieving climate protection goals by improving energy efficiency, reducing the need for cold and further reducing emissions of fluorinated greenhouse gases. The increasing use of climate protection technologies in refrigeration and air conditioning systems is in line with the latest technologies and thus contributes to their market penetration.

Projects financed under these guidelines aim to generate additional annual savings of 100,000 tones of CO₂-eq. (Gross, adjusted baseline) over the life of the measures.

The federal government has set itself ambitious climate protection targets:

- Germany's greenhouse gas emissions are to be reduced by at least 55 percent by 2030 compared to 1990 levels.
- In the long term, a reduction of at least 70 percent should be achieved by 2040, and by 2050, mainly greenhouse gas neutrality. In 2016, a climate protection plan till 2050 was developed, the federal government adopted a framework and guidance to further define and develop appropriate climate protection strategies in various areas of activity.
- The aim is also to limit the use of subsidies per tone of CO₂ equivalent avoided to € 55 per tone (gross, adjusted to baseline). No grant eligibility. Rather, the designated authority makes the decision at its own discretion within the available budget.

Funding

- according to the guide is project finance.

- is usually provided in the form of a non-refundable grant in the form of a lump sum.

- for stationary refrigeration and air conditioning systems using non-halogenated refrigerants is provided if they are rebuilt or only rebuilt and the chilled water or re-cooling system (water, brine, air distribution system) remains in place.

Without replacing the refrigeration unit, the replacement of individual components, for example, the ULT refrigeration, air cooler, cooling system (water, brine air distribution system) is not supported.

WHAT DO WE START WITH ?

Planning

Funding goes as follows:

- 500 for air cooler, minimum € 1,000, maximum € 5,000
- 1000 euros for the integration of one or more heat accumulators,
- 1000 euros for the installation of one or more cold accumulators.

Pre-planning, which is also required for the application, is not funded. Pre-planning and implementation planning are reviewed and submitted separately. Funding eligibility can only be valid after receiving the funding approval notification.

AS FOR THE DOCUMENTS?

Applications for funding for refrigeration or air conditioning activities can only be submitted electronically using the electronic form provided by BAFA (https://www.bafa.de/DE/Home/home_node.html) . When applying to BAFA, the following technical documents must be submitted / uploaded along with the funding application:

- Graphical representation (functional diagram) showing the relationship between major components, piping, hydraulics and additional systems (storage tanks, regenerative energy systems).
- Documentation of the refrigeration unit, including a functional description, indicating
 - a detailed description of the necessary measures and the planned installation
 - calculation of cooling capacity in accordance with BAFA specifications
 - specifications or excerpts from the specifications of the main components
- Major refrigeration system components such as compressor, evaporator and condenser / gas cooler require manufacturer's and performance data, or appropriate specification data must be attached.

STATEMENT OF APPLICABILITY WHAT'S THAT?

The documentation of use must be submitted to BAFA within three months after the acceptance of the refrigeration or air conditioning system, but no later than three months after the expiry of the approval period or the acceptance (end of handover) period.

In justified cases, an application for an extension may be submitted before the expiry of the above deadlines.

Proof of use can only be submitted electronically through the use of portal provided by BAFA. In the documents of use, the applicant proves that he has complied with the approved measure and the conditions. At this stage BAFA will indicate which documents must be attached.

HOW COULD I COUNT IT BY MYSELF?

Commercial refrigeration units ULT (direct evaporation)

The refrigeration of a commercial refrigeration system (TK) is calculated at $t = -25\text{ ° C}$ and a condensing temperature of 40 ° C , in the case of systems with CO₂, at 36 ° C at the outlet of the gas cooler or an ambient temperature of 35 ° C .

Also, for systems with usable temperatures below -40 ° C - if possible - design for the above temperature range. If this is not possible, the cooling capacity at the usable temperature must be multiplied by the following factor F:

$$F = 1 - 0.02 * (\text{useful temperature in } \text{° C} + 25\text{ ° C})$$

This results in a doubling of the cooling capacity, for example at a usable temperature of 75 ° C .

Funding is limited to € 150,000 per unit and does not exceed 50% of eligible costs.

The total funding amount is the sum of the separately calculated partial funding amounts for

- Cold generator
- Components, systems and storage
- Planning a fixed rate
- Combined bonus.

$$F = (A * X^B + C) * X$$

X is a variable denoting cooling capacity (kW), storage capacity (kWh), or volume (dm³). **A**, **B**, and **C** are specific factors that depend on the type of cold generator, component, or storage tank. When calculating the refrigerating capacity, the technical design conditions for refrigeration generators and heat exchangers specified in the subsidy regulation must be observed.

Commercial refrigeration units TK (direct evaporation) use such values for the coefficients :

A (633.879)	B (-0,00009162)	C (-633.376)
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In our case, we calculate the refrigeration capacity according to such limits $1 \leq Q_o \leq 600 \text{ kW}$

To simplify the task, use the link to the online calculator-

If the refrigeration demand in one location is covered by several refrigeration units, the classification and application depend on the arrangement of the refrigeration circuits.

If several refrigeration circuits of the same category are integrated into one housing, they are connected and considered as one unit. In this case, the cooling capacity of this device is the sum of the cooling capacity of all cooling circuits in the enclosure. The data plate is extremely important.

“Back up systems” are systems that are not required to cover the cooling demand during normal operation. They turn on only if the main system fails or does not work. Redundancy systems are allowed and treated as normal refrigeration systems for the application and calculation of funding.

Sometimes combined systems are required, below is an example of how it all works together

	Cold generator						
Components, systems, storage, lump sums Information for typical applications, subject to change	NK / AC refrigeration units (also turbochargers with R718)	Ab-adsorption and systems	Industrial refr. installations NK, TK (direct evaporation)	Retail trade in food products – refr.systems with refr. units	Adiabatic heat exchangers (hybrid coolers)	Adiabatic Evaporative Cooling Systems	Waste heat pump
Deep freeze with liquid	yes	yes	no	no	yes	no	no
Air cooler / evaporator for NK / TK	Yes/no	yes	yes	no	no	no	no
Air cooler/evaporator for air conditioning and process refrigeration systems	no / yes	yes	yes	no	yes	no	no
Adiabatic heat exchangers (hybrid coolers)	yes	yes	yes	no	no	no	no
Heat exchanger for liquid-cooled systems	yes	yes	yes	no	no	no	no
Hot water - layer heating boiler	yes	no	yes	yes	no	no	yes
Tank for storing cold water	yes	yes	no	yes	yes	no	no
Ice storage	yes / no	yes	no	yes	no	no	no
Latent heat accumulator	yes	yes	no	yes	yes	no	yes
Cooling brine circuits (circulation)	yes	yes	no	no	yes	no	yes
Components for ...							

...heat pump operation (external evaporator)	yes	yes	yes	yes	no	no	no
...utilization of waste heat from the refrigeration system	yes	yes	yes	yes	no	no	no
... free cooling mode	yes	no	no	no	no	no	no
Total amount for							
... planning the introduction of liquid coolers and sorption coolers	yes	yes	no	no	yes	no	no
... integration of regenerative photovoltaic energy, wind, CHP with biomass	yes	no	yes	yes	yes	yes	yes
... integration of thermal regenerative energy (solar or geothermal energy, CHP with biomass)	no	yes	no	no	no	no	no

IF IM ENVIRONMENTALLY FRIENDLY COULD I PROFIT FROM IT?

Recuperative energy – the source of energy that is suitable for further increasing the energy of the general refrigeration or air conditioning system and thus has the positive effect of protecting the climate from the above-mentioned systems.

A bonus of € 100 per kilowatt of peak power provided by the recuperative electricity system is awarded for the installation of a new renewable electricity generation system. However, this takes into account the output power of the regenerative power system, which is at most twice the installed power of the electric drive of the subsidized cold generator.

The Combined Bonus is awarded only once, either for the provision of regenerative electrical energy or for regenerative heat. This also applies to a system combination consisting of a compressor refrigeration system, a sorption system, and a plant (biomass). A double combined bonus for the simultaneous supply of regenerative power (for a compression refrigeration system) and regenerative heat (for a sorption system) is not possible.

Heat pump is another element in subsidies policy.

The waste heat is used for heating in a separate heating system or for a technical process. This technology is already used by our client for example [CoolInn](#).

DON'T FORGET ABOUT SYSTEMS MAINTENANCE

Each funding recipient is required to provide the Federal Economic and Export Administration (BAFA) with certain system performance data for regular monitoring for five years from the date the funded refrigeration or air conditioning system is accepted. The data is used to determine the status of the directive's implementation and the effects achieved. This is intended to document and further develop quality standards for subsidized systems. If this intelligence requirement is not met in whole or in part, BAFA may withdraw funding.

In this case, the grant can also be revoked. The reporting obligation is considered fulfilled if at least one report is submitted or submitted for each year of activity (starting from the date of adoption). BAFA will provide an electronic reporting form for reporting.

Monitoring is not required for the following installations:

- Ready-to-connect refrigeration units
- Systems up to 5 kW cooling capacity for every application

IMPORTANT

In order to collect operational data, it is necessary that the subsidized installations are equipped with electricity meters and heat (cooling) meters.

The planned flat rate covers design support and calculation of piping, insulation, valves (valve groups), expansion tanks, control and regulation for connecting cooling points to appropriate liquid cooling units (so-called indirect systems), their combination with heat storage units and / or cold, as well as performing hydraulic balancing of the entire system as a whole.

A flat rate is provided for systems with at least two components to integrate air coolers or cold or heat accumulators. Funding is € 500 for an air cooler and is limited to a maximum of € 5,000. Indirect systems with cold water, brine, or "ice slurry" are eligible for funding. The planning package is not available for direct expansion systems.