Your air-conditioning system consumes unnecessary amounts of fuel and causes CO_2 emissions. The following tips will help you to protect the environment and your health and will also save fuel:

- **Ventilate well before driving in summer:** This reduces the temperature of the heated-up car automatically.
- **Estimate the duration of your trip:** For short trips, the air-conditioning should be turned off to avoid an unnecessary increase in fuel consumption.
- **Keep windows closed after starting your journey:** Set the fan to medium speed in the first minutes of driving, and turn on recirculation. This prevents warm fresh air constantly coming in from outside in the beginning.
- **Do not set temperature too low:** The difference between outside air and interior temperature should be a maximum of 6 degrees.
- **Set fan correctly:** To avoid draughts and prevent catching colds, the air flow should not be directly aimed at the body.
- **Regular maintenance instead of cost shock:** No maintenance is necessary in the first 4 years. Subsequently, experts recommend having the air-conditioning system checked every 2 years to measure the loss of refrigerant. If the loss is not compensated for, the air-conditioning system must bear a higher load and wears out more quickly. If you never switch on the system, the lifetime will also be reduced.
- **Ask for information:** When buying a car, ask about the refrigerant used and the air-conditioning technology, as well as the additional fuel consumption to be expected.

Join the PRO KLIMA campaign:

Test what you know about MAC systems and take part in our online survey – visit our website regularly and sign up for our newsletter.

The Deutsche Umwelthilfe e.V. (German Environmental Aid Association) and its partner Verkehrsclub Deutschland e.V. (German Traffic Association) want to press ahead with the introduction of environmentally-friendly air-conditioning technology. For this reason, we launched the information campaign **"PRO KLIMA: Efficient MAC systems with natural refrigerants"** in 2010.

PRO KLIMA

- **informs** car drivers about innovative air-conditioning systems.
- **makes consumers aware** of the environmental impact of mobile air-conditioning systems (MAC).
- **reports** regularly on current events and gives background information from the industry.
- **organises** conferences with political, business and research experts.
- **works on recommendations** for the quick introduction of a future-oriented air-conditioning technology and calls for its implementation.
- **provides a forum** for environmental and consumer protection organisations, public institutions, administrations, interested companies, driving schools, vehicle fleet operators and many more.

With our campaign, we support the implementation of the European requirements regarding the reduction of environmentally harmful substances (F-gases).
For further information and background material on our campaign, please see: www.autoklimaanlage.info

PRO KLIMA is a joint campaign of

Deutsche Umwelthilfe

VCD Verkehrsclub Deutschland

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As of: June 2012

Our campaign is funded by the EU Commission as part of the EU Life+ Programme.

PRO KLIMA

Efficient MAC systems with natural refrigerants

Climate protection
also in your car!

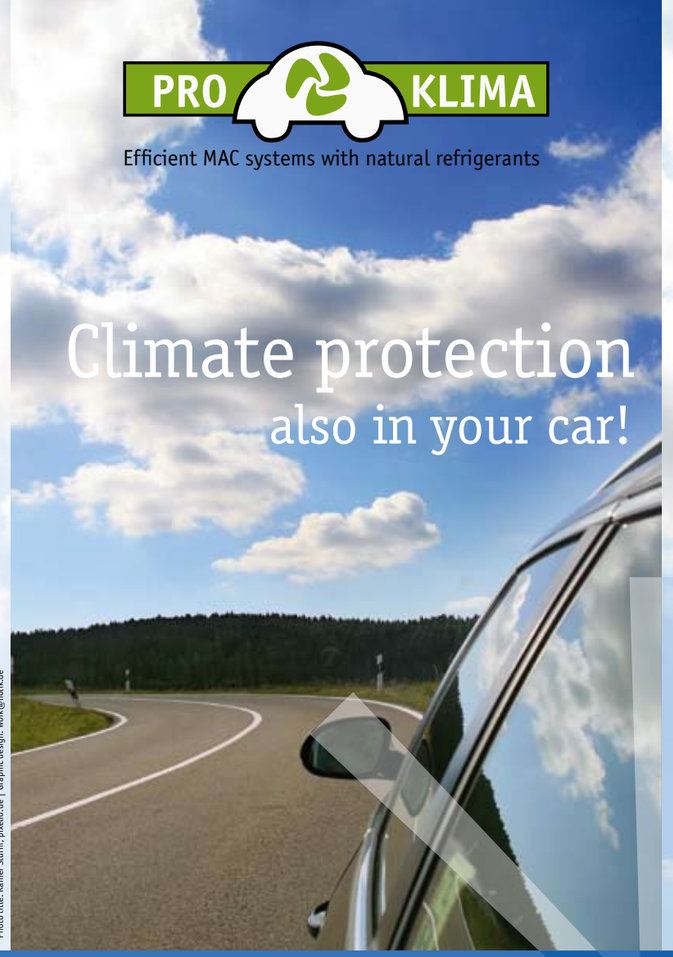


Photo title: Rainer Sturm, pixelio.de | Graphic design: wort@hdthk.de

What you should know
about mobile air-conditioning systems ...

What is at issue?

Cool air at the push of a button

When you buy a new car these days, you automatically have an air-conditioning system on board. Most of us use the system routinely without thinking about it. In Europe, already more than 90 percent of new cars are equipped with an air-conditioning system, and this number is increasing by 13 million air-conditioned vehicles every year.

An air-conditioning system offers comfort and even allows safer driving, because concentration can fade at high temperatures. In winter, the air-conditioning system helps to clear misted window panes.

Worldwide, the number of vehicles is rising sharply, as are the corresponding CO_2 emissions. Experts of the Intergovernmental Panel on Climate Change (IPCC) expect one billion air-conditioned vehicles in 2015.

The burden on the climate will grow because of both immense fuel consumption and the use of air-conditioning systems which are not only inefficient, but also work on the basis of greenhouse gas-intensive, chemical refrigerants.

How are mobile air-conditioning systems (MACs) related to protecting the environment?

Refrigerants are harmful to the climate

Air-conditioning systems are not leak-proof. From each system, considerable amounts of refrigerant escape into the atmosphere through small leaks and, when not properly maintained, even during normal operation. However, no air-conditioning system works without refrigerant. Usually, the chemical R134a (tetrafluorethane) is used, which causes enormous damage to the climate: **R134a contributes to the greenhouse effect and is 1,430 times more harmful to the environment than CO_2. Most car drivers are not aware of this.**

Scientists at the United Nations Environment Programme (UNEP) calculate worldwide R134a emissions of 180,000 tonnes for the year 2020. This equals approx. 240 million tonnes of CO_2.

Forecast of worldwide R134a emissions from MACs in 2020

By comparison: CO_2 emissions from road traffic in Germany in 2009

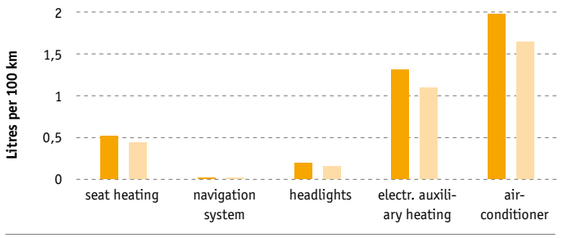
Sources: Federal Environment Agency 2011; United Nations Environment Programme (UNEP) 2009; photo: Adam Spence/wikimedia GNU; layout DUH

Higher fuel consumption

The use of an air-conditioning system may increase fuel consumption in a car by 10 to 15 percent, and in city traffic by even up to 30 percent. **This means: around 2 litres more fuel for every 100 km.** Whether consumption will rise further depends on many factors. The behaviour of the car owner also plays an important role, but the technology of the system is most essential: with simple, unregulated air-conditioners the vehicle needs up to 2.5 times more fuel than modern, electronically-regulated systems.

Something many car drivers are not aware of: additional consumption caused by air-conditioning systems is neither identified by the manufacturers nor considered in consumption and climate protection requirements.

Additional consumption through ancillary components
related to the standardised New European Driving Cycle (NEDC)



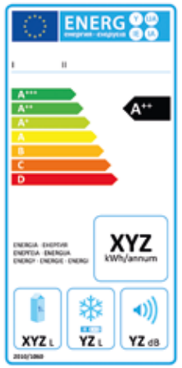
Sources: TÜV Nord/Federal Highway Research Institute (BASt) 2011

What is sustainable air-conditioning?

Many car drivers would opt for an environmentally-friendly air-conditioning system when buying a new car, even if the price was higher. Would you do that?

As per January 2011, the EU established a limit value for refrigerants in MACs, to end the use of extremely harmful substances such as R134a in the medium term. Refrigerants in new vehicle types may not exceed a global-warming potential (GWP value) of 150. From 2017 onwards, this shall apply to all new vehicles – a first important step towards protecting the climate.

What are we calling for?



Efficiency

Whenever vehicles are equipped with air-conditioning systems, manufacturers must use the most efficient air-conditioning technology available. Of course, a basic requirement is that the system is leak-proof. In addition, the vehicle itself should contribute to air-conditioning, for example, by heat-reflective glazing. A cooler interior in the vehicle reduces the energy demands for air-conditioning and thus fuel consumption.

Natural refrigerants

These can be found in the material cycle of nature – therefore they are called “natural”. As far as climate protection is concerned, natural refrigerants are unrivalled. However, their use also pays off for the car owner. Therefore, we call for a targeted expansion of environmentally-friendly air-conditioning using CO_2 as a natural refrigerant, not only in cars but also in public buses. This target should be supported by the Federal States.

Official car of the Federal Environment Agency with a CO_2 air-conditioning system
Photo: Gabriele Hoffmann/UBA

No chemicals

We call for turning away from dangerous chemical refrigerants such as R1234yf. This new substance may cause acid burns and severe health damage for passengers and rescuers following a car accident. All vehicles already filled with this chemical must be identified with a clearly visible hazard symbol.

Burning vehicle after leakage of 1234yf in the engine compartment.
Photo: wm-punkt/DUH

Transparency

Additional fuel consumption caused by air-conditioners must be ascertained uniformly at EU-level and the corresponding figures must be made available to all car buyers. Corresponding current EU activities must aim at establishing a realistic measuring method and should be implemented soon.

Function test stand in the test laboratory; photo: MAHA