

Expert interview

## **"The competitive disadvantage of natural refrigerants is diminishing"**

**Frankfurt (Main), 18 December 2017. Stephan Sicars (UNIDO) talks about the market situation for plants using natural refrigerants in emerging and developing countries.**

Within the framework of the Kigali Amendment to the Montreal Protocol, altogether 150 countries have undertaken the commitment to gradually dispense with using HFCs that impact on the climate. The rate of implementing the phase-down process depends on the development status of each particular country. While industrial countries such as the USA want to implement 85% decrease in HFCs by 2036, much longer periods apply for emerging and developing countries. eurammon member Stephan Sicars from the UNIDO, United Nations Industrial Development Organization, looks at trends and tendencies covering all aspects of equipment with natural refrigerants in emerging and developing countries.

**What role do industrial countries play when it comes to implementing the Montreal Protocol in emerging and developing countries?**

**Stephan Sicars:** The industrial countries are currently providing about US \$160 million each year for implementing the Montreal Protocol in the developing and emerging countries. But a lot has changed since the Montreal Protocol came into force more than 25 years ago. Back then, both the know-how and many products came from the industrial countries and were consumed in developing countries. Today, many developments come from the emerging countries. Frequently they are just as good as or even better than solutions produced by the industrial countries when it comes to simplicity, value for money and robustness.

**How is the market for natural refrigerants developing in the emerging and developing countries?**

**Stephan Sicars:** Numerous more recent applications with natural refrigerants are currently doing well in the market, without any additional legal interference such as prohibitions, subsidies or taxation. Systems with natural refrigerants are said to be easy to implement, but only under certain conditions. CO<sub>2</sub>-based systems are preferably used in larger countries where refrigeration system installers have a network of technical representatives, with

training and maintenance provided by the local dealerships. Ammonia is mainly used as a refrigerant in countries that already have many years of experience with ammonia. However, the ability to plan more complex ammonia systems including the safety aspects and to steer such systems through the corresponding approval processes is currently declining. This refers to both system installing firms and also to the authorities in some medium-sized countries.

### **Are there limits for applications with natural refrigerants?**

**Stephan Sicars:** In technical terms, a large share of refrigerating tasks can be solved well or very well with equipment that uses natural refrigerants. However, development work is still necessary for systems in the medium capacity range between 5 and 100 kW, particularly for commercial air-conditioning. Due to safety precautions the medium capacity range of typical direct evaporation air-conditioners would exceed the allowed charge limits for hydrocarbons. On the other hand this range has too low capacity for efficient water chilling units. Intensive work is currently in progress worldwide on corresponding solutions.

### **Which application areas have the greatest need for action?**

**Stephan Sicars:** Refrigerants are responsible for about 1.5% of the anthropogenic greenhouse effect. Most of the global emissions come from small air-conditioning units (mini-splits) and car air-conditioning systems. It looks as if car air-conditioning systems at least are moving towards refrigerants with a low greenhouse effect. That cannot be said for split air-conditioning units. Although the developing countries have a number of manufacturers for split refrigeration systems with hydrocarbons as refrigerants, with most major manufacturers offering a capacity for producing several million units a year, it is almost impossible to sell the units at the moment for competitive reasons. Now that the units reach the same safety levels as the current standard units, the key remaining barrier posed by hydrocarbon systems consists in the higher installation costs. However, higher costs are difficult to compensate in the purely market economy environment prevailing in developing countries.

### **How can we get people willing to invest more in climate-friendly technologies?**

**Stephan Sicars:** With a unit operating on natural refrigerants, the customer has to take on a very high share of the direct and indirect costs. With equipment operating on fluorinated hydrocarbons, these costs are paid by society at large because in the long term it is society

at large that has to cover the consequences of the far higher environmental pollution. However, this competitive disadvantage would appear to be diminishing – not by sharing out the environment costs but by implementing stricter emission prevention requirements. With the costs resulting from the climate relevance of refrigerants increasingly being shared out between the equipment, and similarly with the requirements made by the governments in terms of operation and leakage scenarios getting stricter all the time, solutions with natural refrigerants will sell better on the market. On the other hand, it is, for example, also relatively probable that China will play a greater role in steering the market in future. That way new technologies would become increasingly competitive on China's huge market and could then be exported to other countries.

**First Montreal, then Kigali: can we expect even tighter regulations for refrigerants in future?**

**Stephan Sicars:** I believe so. In my opinion, it is improbable that refrigerants with a GWP > about 100 will see broad use in the medium term. While apart from prohibiting refrigerants that impact on the climate, there are also other ways of mitigating climate change, for example by enhancing the energy efficiency of refrigerating systems. After all, the use of fossil energies is one of the main causes of CO<sub>2</sub> emissions. But in global terms, for the individual states it is far cheaper and easier to enforce a refrigerant prohibition than to specify energy efficiency measures for plants and equipment. In other words, plants that run on refrigerants with a higher GWP will certainly have to meet far stricter requirements in terms of equipment tightness and monitoring in future. This makes the use of such refrigerants increasingly unattractive because of the expense involved, thus diminishing the competitive disadvantage for machines with natural refrigerants.

Picture:



Caption: eurammon member Stephan Sicars from the UNIDO, United Nations Industrial Development Organization.

#### **About eurammon**

eurammon is a joint initiative of companies, institutions and individuals who advocate an increased use of natural refrigerants. As a knowledge pool for the use of natural refrigerants in refrigeration engineering, the initiative sees as its mandate the creation of a platform for information sharing and the promotion of public awareness and acceptance of natural refrigerants. The objective is to promote the use of natural refrigerants in the interest of a healthy environment, and thereby encourage a sustainable approach in refrigeration engineering. eurammon provides comprehensive information about all aspects of natural refrigerants to experts, politicians and the public at large. It serves as a qualified contact for anyone interested in the subject. Users and designers of refrigeration projects can turn to eurammon for specific project experience and extensive information, as well as for advice on all matters of planning, licensing and operating refrigeration plants. The initiative was set up in 1996 and is open to companies and institutions with a vested interest in natural refrigerants, as well as to individuals e.g. scientists and researchers.

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