



Converting the Production of Refrigeration Equipment to Natural Refrigerants

Background

In Swaziland, state-of-the-art refrigeration equipment is currently manufactured using the fluorinated refrigerants HFC-134a and HFC-404a. These gases are currently used worldwide, contributing considerably to global warming.

Natural refrigerants (e.g. hydrocarbons, ammonia and CO₂), which are both climate- and ozone-friendly, have not been introduced in Southern Africa yet, despite their environmental and energy-efficiency benefits. Especially when utilising flammable refrigerants such as hydrocarbons, certain safety regulations and measures have to be considered and carefully implemented during production and servicing of the equipment. This requires information and know-how which needs to be disseminated to the servicing sector parallel to the sale of the new refrigeration appliances.

The refrigeration equipment manufacturer Palfridge had already considered the conversion of its manufacturing lines from the use of the unsustainable fluorinated refrigerant gases to natural refrigerants. But due to safety concerns and requirements, the company was unsure and reluctant to engage on its own in the application of this new technology. Finally, Palfridge agreed to accept the risk of converting their production lines given the technical assistance and financial support provided within this pilot project.

Project Description

The project converts the entire production of domestic and commercial refrigeration appliances of the manufacturer Palfridge in Swaziland to hydrocarbon refrigerants. This is the first demonstration of hydrocarbon technology in the Southern African region. It is meant to showcase a viable and sustainable alternative to replace the fluorinated refrigerants currently in use. The important issues concerning the safe use of flammable refrigerants are addressed through state-of-the-art safety devices, as well as intensive training and appropriate education of the entire Palfridge staff (engineers, technicians, workers). This also includes assistance with the safe design of the new models. The project also supports the development of appropriate information and training materials for marketing the equipment at the point-of-sale and for service technicians which would be servicing the equipment in later years.



Project Impact

Every sold and operating hydrocarbon based refrigeration equipment replaces permanently the use of fluorinated refrigerants in that application. The conversion of the annual production of approx. 94,000 units to natural refrigerants cuts direct emissions of F-gases by up to 29,000 tonnes CO₂ equivalent per year, thereby achieving significant and sustainable climate benefits. The new models are designed for higher energy-efficiency, which will reduce the energy demand during operation. Thereby, electricity costs for households and commercial end-users such as retailers will be reduced, and greenhouse gas emissions avoided.

The conversion to modern production technologies also has a positive effect on Palfridge's market position, thereby strengthening a local, medium-sized company in the global competition. Qualifying the engineering and technical staff in new refrigeration technologies will help to secure and maintain around 500 jobs in Swaziland.

The project demonstrates the technical and economic feasibility of natural refrigerant-based technology and shall encourage other companies in the region to follow suit.

Title Converting the production of refrigeration equipment to natural refrigerants

Country Swaziland

Sector Refrigeration

Objective Conversion of refrigeration equipment production from fluorinated to natural refrigerants

Target Group Refrigeration manufacturers and technicians

Project Executing Organization BMU (German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety)

Implementing Partner Organization Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH; National Ozone Unit (NOU) Swaziland; Palfridge (local manufacturer of refrigeration equipment)

Project Approval October 2008

Project Duration Until December 2009

Project Budget EUR 1,400,000

Funds The project is funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety within the framework of the International Climate Initiative based on a decision of the German Federal Parliament.

Impact on Climate Protection

Presently, 20 tonnes of HFCs are annually used during production. The replacement of these refrigerants will lead to a prevention of direct emissions of 29,000 tonnes CO₂e.

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