



Converting Air-Conditioning Systems in Public Buildings in Mauritius to Natural Refrigerants

Background

In Mauritius, several large public buildings still have central air-conditioning systems (chillers) operating with climate- and ozone-damaging CFC refrigerants. These systems are in a very poor state of repair and leak considerable amounts of refrigerant. Due to this situation, they also consume large amounts of electricity. This is a serious environmental problem because of the ozone depletion potential (ODP) and the extremely high global warming potential (GWP) of CFC. The government of Mauritius is therefore interested to replace these chillers as soon as possible.

The use of ozone- and climate-friendly refrigeration and air-conditioning technologies based on natural refrigerants is already well known and tested in Europe, but this technology is still an innovation for Mauritius and other tropical countries in the region. Refrigeration engineers and technicians are not aware of its benefits or how to operate these systems and are very reluctant to accept the change. The currently available replacements in Mauritius therefore operate with fluorinated refrigerants, which have no more ODP but still a high GWP.

Project Description

The project assists the Ministry of Environment with information and technical assistance to facilitate the decision making in favour of introducing natural refrigerants in central air-conditioning systems. This environmentally friendly technology is still new to Mauritius and quite expensive. To overcome these concerns, the project installs ammonia chillers to demonstrate their energy efficiency and safety. For this, two government buildings were selected to replace the existing CFC-12 and CFC-11 chillers. The two existing plants are annually emitting up to 100% of their refrigerant charge (420kg and 270kg respectively) with the extremely high global warming potentials of 10,600 (CFC-12) and 4,680 (CFC-11).

It is also part of the project design to provide intensive technical and safety training to the engineers and service technicians to create confidence in handling the new ammonia systems. The training courses are held at the European manufacturer's premises to ensure that maintenance, servicing and repairing procedures are done according to highest safety standards.

In addition, the Ministry of Environment is advised on possible co-financing opportunities as an incentive for further investment in this sector through the Clean Development Mechanism (CDM).

Without this project, chillers or individual split air condition units operating with fluorinated refrigerants would be installed as replacement, emitting further considerable amounts of climate-damaging refrigerants.



Project Impact

The conversion of the air-conditioning systems leads to the permanent avoidance of 38,000 tonnes CO₂ equivalent for an estimated operating time of 15 years. Further to that, the installation of more energy-efficient air-conditioning systems reduces electricity costs for the building operator.

The project is designed to demonstrate the feasibility of ammonia chillers in a tropical climate and the associated enhanced energy efficiency. The results can be replicated elsewhere, thus facilitating the transfer of this environmentally friendly technology to other countries in the region.

Title Converting air-conditioning systems in public buildings to natural refrigerants

Country Mauritius

Sector Air-Conditioning

Objective Conversion of chillers in large public buildings from fluorinated to natural refrigerants; training for engineers and service technicians on operation and maintenance

Target Group Operating companies of the selected public buildings; owners of large air-conditioning systems

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; Ministry of Environment in Mauritius

Project Approval October 2008

Project Duration Until December 2009

Project Budget EUR 1,200,000

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 Ozone Layer and Climate Protection

The replacement with climate-friendly ammonia chillers will prevent direct refrigerant emissions of 38,000 tonnes CO₂e based on an expected operating time of 15 years.

Through the usage of a natural refrigerant, 0.39 tonnes of ODP will be avoided.

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