

# **FIELD EXPERIENCE IN HEATING AND COOLING SYSTEMS BY INTEGRATING RENEWABLE AND TRADITIONAL ENERGY.**

Jan Boone

MAYEKAWA EUROPE S.A.,Leuvensesteenweg 605, 1930 Zaventem, Belgium

Tel. 32-2-757-9075, Fax. 32-2-757-9023

## **ABSTRACT**

This paper presents the results of operation in the field of a geothermal sourced heat pump and an adsorption chiller using solar energy.

The systems are based on the use of natural refrigerants, strongly contribute to the reduction of consumption of fossil fuel and reduce significantly the CO<sub>2</sub> emissions.

In the first plant we present an over-compression NH<sub>3</sub> high temperature heat pump system which utilizes geothermal water as heat source. This hot water heat pump is used to produce hot water for district heating in Slovenia. The energy of the geothermal water at 35 to 40°C is used via a flooded type heat exchanger heat pump and enables us to produce hot water of 60°C with a coefficient of performance(COP) in the range of 5 to 7 depending on the source temperature. This heat pump makes it possible to reduce the amount of fossil fuel, normally needed for heating the water, with 1467 MWh per year.

In the second plant we present an adsorption refrigerator which utilizes hot water for desorption of the water by utilizing solar energy. The adsorption refrigerator is used to produce chilled water for air conditioning purposes. The hot water of 65 to 80°C obtained from the solar energy is used in the desorption phase of the operation and enable us to produce chilled water of 9 to 10°C with a COP of 7 to 10,8 depending on the chilled water temperature level.

This adsorption refrigerator makes it possible to reduce the amount of CO<sub>2</sub> emission with more than 50% compared to a conventional chiller.

---

**Renewable Energy, HVACR 14<sup>th</sup> Conference. UNEP-IIR-CSGG-EEC. 21-1-2011 Scotland.**