

HP-ACS: A cool revolution in refrigerated transportation

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Credit: Hebert Santos from Pexels

A promising new technology designed to achieve efficiencies in cold

transport vehicles is currently being developed as a cost-competitive alternative to standard air-conditioning. By making better use of waste heat, the project could help cut emissions and save businesses money.

Approximately 650 000 refrigerated road vehicles are currently in use in the EU, with the global refrigerated transportation market predicted to top EUR 5 billion by 2015. In order to meet demand, many refrigerated vehicles will have to be replaced or upgraded. Furthermore, in a globally competitive market, operational efficiencies must be made.

In this respect, fuel price increases remain a critical concern to cold [transport companies](#). Some eight percent of fuel consumed by a refrigerated van or truck currently goes towards refrigeration. This is usually performed by energy-consuming compressor-driven Air Conditioning Systems (ACS).

The EU-funded HP-ACS project aims to address this through the development of an innovative Metal Hydride Cooling System (MHCS) based on hydrogen adsorption/[desorption](#) on solid beds. The system would work by exploiting the [waste heat](#) generated by the thermal engine.

Given that refrigerated vans and trucks can consume up to 100 000 litres of fuel a year, the development of the innovative sorption heat pump could save up to 8000 litres of fuel a year for each van.

Some crucial [technological challenges](#) however must first be addressed. The project is looking into developing viable materials for the hydrogen adsorption beds, which must be tailored for the specific application. The heat-pump design also needs to be optimised, while the weight and volume of the material has to be minimised.

Once these key points have been achieved and validated, the HP-ACS

project will be well on its way to developing a new way of competitively cooling refrigerated vans. The 24-month project, which began in April 2013, has received EUR 960 000 in EU funding. The coordinator is Italian research agency ENEA, which has achieved some very promising results in this field over the past few years. The work carried out until now has shown the feasibility of the process at the lab scale.

More information: www.hp-acs-project.eu

Provided by CORDIS

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