



SCRIB



Reversible solar air conditioning system integrated into the building

SOLAR
POWER

Context

One of the obstacles to the development of solar energy in our countries is the gap between peak production, during periods of strong sunshine, and peak consumption which tends to be in the evening and in winter. This is particularly true in the construction sector which today accounts for 40% of the energy consumed in France.

However one important application is an exception to the above rule: air conditioning where requirements coincide exactly with the periods of highest solar availability. The use of solar air conditioning is restricted at present because the investments are substantial to install equipment that is used only a few months in the year.

Objectives

The objective of the SCRIB project is to develop a reversible solar air conditioning solution that is highly efficient and has a low environmental impact, thereby meeting all the heating and air conditioning requirements of industrial and commercial buildings (air conditioning, heating, industrial refrigeration and DHW). These multiple functions enable a return on investment throughout the year.

The project proposes a comprehensive solution that takes into account the specificities of solar energy. This solution includes energy storage devices and back-up energy systems. The system consists of a reversible absorption machine, powered by a system of solar thermal heat panels based on innovative concentrators. The proposed choices and technological innovations will provide a competitive solution with a low environmental impact.

Implementation

The SCRIB project will be rolled out in two phases:

- Development of a 10kW (cold kW) research demonstrator to demonstrate the proper functioning of the entire reversible solar air-conditioning system, creation of a pre-scaling tool capable of simplified calculation of the planned system performance;
- Development of a 700kW pre-industrial demonstrator, the first full-scale installation on a representative building, demonstrating the benefits of the reversible solar air conditioning solution all year round.

PROJECT SUPPORTED BY ADEME AS PART OF THE LOW-CARBON ENERGIES PROJECT IN THE INVESTMENTS FOR THE FUTURE PROGRAMME

Duration: 5.5 years

Launch: May 2011

Total cost of the project : €2.8 M

Including PIA support: €1.4 M

Form of PIA support: subsidies and refundable grants

Location: Mandelieu-la-Napoule (PACA)

Coordinator



Partners



Prototypes of Helioclim solar panels on roofs

Expected results

Innovation

- Unique high energy efficiency system addressing all the heating and air conditioning needs of buildings all year round at a very competitive cost;
- Concentration-based solar thermal heat panels and vacuum tube absorbers that are highly efficient, low weight and cost-effective;
- Absorption machine integrating an energy storage solution without heat loss.

Economic and social impacts

Production will be carried out in France. Ultimately the project will create jobs for technicians and engineers.

The solution developed will substantially help reduce energy bills while maintaining the thermal comfort of buildings. This solution is particularly suitable for areas with strong sunlight and strong air conditioning needs, where electricity supply is limited either due to the production cost or due to network limitations.

This solution will also provide access to high quality hygiene and comfort conditions in energetically isolated areas, particularly for hospitals or food conservation applications.

Environment

The widespread use of the solution would reduce by more than half the expenditure on non-renewable energy in buildings, exceeding the goals of renewable energy development programmes.

The emission of 10,000 tonnes of CO₂ could be avoided with the installation of 76 units.

Applications and markets

The goal of the SCRIB project is to produce an efficient and competitive reversible solar air conditioning technology, at a cost that enables widespread installation due to a price per installed kW comparable to that provided by conventional electric compression-based reversible air conditioning solutions.

The project and its applications have great potential for export development.



Example on a building

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For more information

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