

Entwicklung eines solaren, sorptions-gestützten Klimalüftungssystems (Kühlen/Heizen) mit (fassadenintegrierten) Vakuumröhren-Solar-Luft-Kollektoren - SorLuKo

Förderkennzeichen: UT 260

In Europe, office and residential-building cooling requirements have been increasing for years due to architectural reasons, the increasingly warmer and more arid climate, and higher demands on comfort. Operation of the required compression refrigeration machines puts a high load on the grids when temperatures are high. This additional energy demand gets added to the peak load periods and thus leads to a severe increase in CO₂ emissions when using fossil energy sources. Since roof areas are often already occupied by units generating renewable energies (photovoltaics, solar heat), this project intends the altogether novel approach of combining tapping energy from facades with the operation of a thermally driven air conditioning system. The objective is to develop an air conditioning system supported by solar sorption and provided with an air-air heat exchanger which converts the solar heat of the collector into heat or cooling energy. In the case of cooling, the supply air is dehumidified isothermally in the air-air heat exchanger and is cooled through subsequent humidification for direct introduction into the respective room. Ambient-air pre-heating by means of the collector and sorptive heat exchanger at the same time allows using the system for heating support, thus enabling environmentally friendly and resource-saving heating and cooling of residential houses and small office buildings. The project directly contributes to a sustainable development, in particular as regards climate, resource conservation, and emission avoidance.