Main goal

The main aim of the SCORES project is to develop and demonstrate a building energy system—including new compact hybrid storage technologies—that optimises supply, storage and demand of electricity and heat in residential buildings. The system will increase self-consumption of local renewable energy in residential buildings at the lowest cost and deferring investments in the energy grid.

The combination and optimisation of multi-energy generation, storage, and consumption of local renewable energy (electricity and heat) brings new sources of flexibility to the grid. It gives options for tradability and economic benefits, enabling reliable operation with a positive business case in Europe's building stock.

Demonstration

The impact of the SCORES system will be a broad assessment covering stakeholders of various economic levels, e.g. individual homeowners, housing companies, grid owners, energy companies and governments, ecological issues and also the security of supply/reduced European dependence on fossil fuels originating from unstable countries from across the globe. Within this impact assessment, a first evaluation is performed on two demonstrations. Demonstrations of the integrated hybrid energy system will take place in two real buildings representative of different climate and energy system configurations for three cases, in Central Europe (Austria) with and without a heat grid, and in Middle/Southern Europe (France) without a heat grid.

REDOX heat battery

One of the key technologies to be demonstrated is a power-to-heat concept developed within the SCORES project. A team of engineers and scientists from the Dutch research organisation TNO built a laboratory-scale setup for testing a heat storage technology based on redox reactions of metals—REDOX heat battery, as it uses the REduction and OXidation reactions to store heat.

In the REDOX heat battery, the metal core is oxidised using air, and the heat generated is used for supplying domestic hot water and space heating. After the reaction, the core is regenerated by supplying hydrogen produced by renewable electricity. This cyclic operation enables the use of this energy storage system in a similar way to the use of standard rechargeable batteries at home, with the difference of storing heat rather than electricity.