

SCORES

Self-Consumption of renewable energy by hybrid storage systems

Ing. Peter van Os
TNO

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.

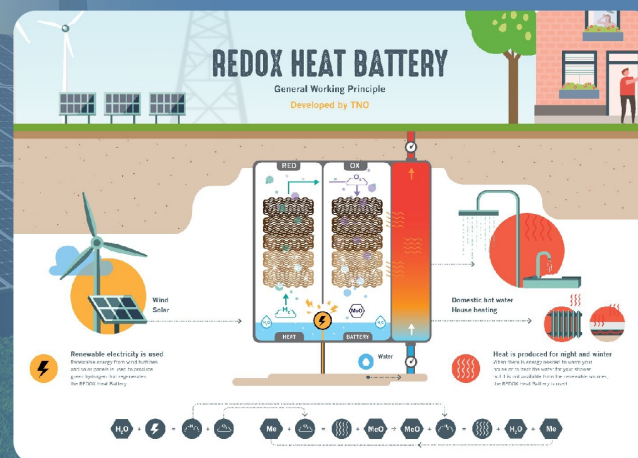


Figure 1: REDOX heat battery – general working principle (Graphics: TNO)



SUMMARY

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The SCORES project is a collaborative project supported by the European Commission under the Horizon 2020 programme for Research and Innovation (Call H2020-EEB-2017). SCORES started in November 2017 and will end in November 2021.

PROJECT LEAD PROFILES

TNO, the Netherlands Organisation for Applied Scientific Research, was founded by law in 1932 to enable business and government to apply knowledge. As an organisation regulated by public law, TNO is independent: not part of any government, university or company.

PROJECT PARTNERS

The project consortium consists of 12 partners and has a strong industrial character, complemented by one university and two research and technology organisations, including TNO as a project coordinator.

CONTACT DETAILS

Ing. Peter van Os
TNO
+31 (0)88 866 64 25
peter.vanos@tno.nl
www.scores-project.eu



FUNDING

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 766464.