

PARTNERS



WWW.AEE-INTEC.AT



WWW.EDFENERGY.COM



WWW.TUE.NL



WWW.MOSTOSTAL.WAW.PL



WWW.TNO.NL



WWW.DOW.COM



WWW.RINACUNSULTIONG.ORG



WWW.CALDIC.COM



WWW.VAILLANT-GROUP.COM



WWW.POLARKAELTETECHNIK.DE



WWW.FENIXTNT.CZ

HORIZON 2020 RESEARCH PROJECT

This project is supported by the European Commission under the Energy Theme of the Horizon 2020 for research and Technological development.

H2020-EeB-2014-2015/H2020-EeB-2015
Grant Agreement number: 680450

This dissemination material reflects only the author's view and the European Commission is not responsible for any use that may be made of the information it contains.

CONTACT

w.vanhelden@ae.at

WWW.CREATEPROJECT.EU



This brochure presents the project status of April 2020.

Produced and designed by FENIX TNT s.r.o.
www.fenixtnt.cz 2020 ©All rights reserved



CREATE[®]



An economically affordable, compact and loss-free heat battery for existing buildings.

Compact **RE**trofit **A**dvanced
Thermal **E**nergy storage

01 ABOUT THE PROJECT

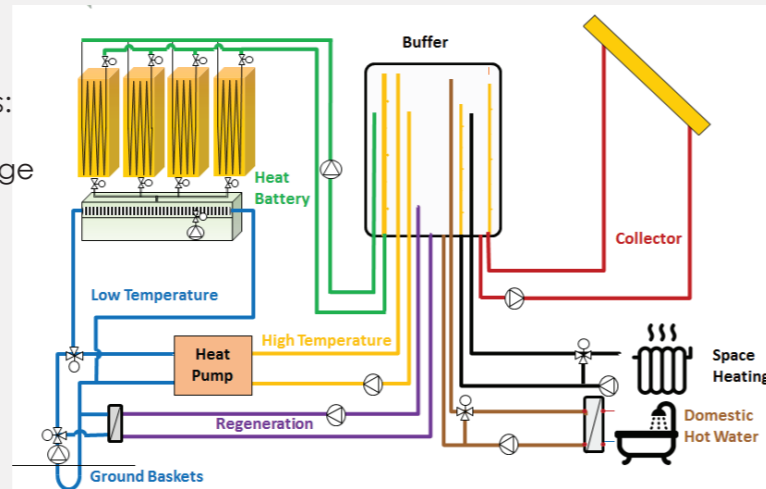
In Europe, the building sector accounts for the largest share of energy consumption. Harvesting, converting and storage of seasonal solar energy in the building sector is therefore essential to achieve the European goal of an energy-neutral built environment in 2050. The CREATE project aims to tackle this challenge by developing a compact thermal energy storage system which is able to provide renewable heat over the entire year.

The CREATE system is an advanced thermal storage system based on Thermo-Chemical Materials (TCMs), that enables economically affordable, compact and loss-free storage of heat in existing buildings. The system consists of several storage modules containing **salt**, which is hydrated (charged) in summer and dehydrated (discharged) in winter.

02 STORAGE SYSTEM DESIGN

The create storage system design consist of the following components:

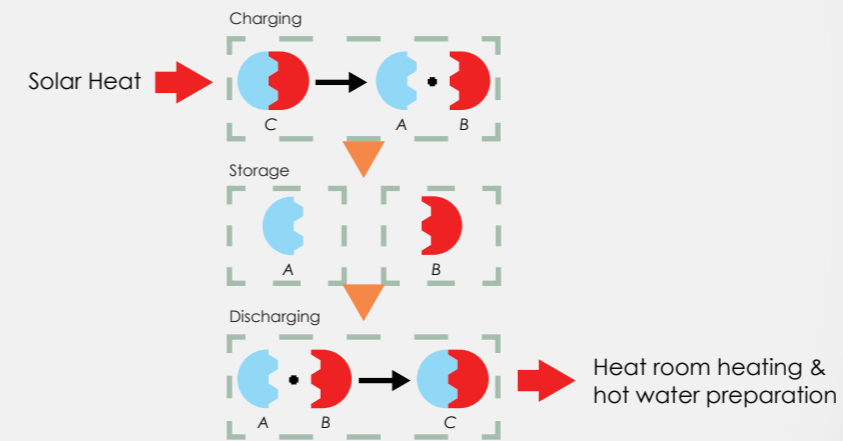
- o Heat battery for seasonal storage
 - Absorber modules with thermochemical material
 - Central evaporator/condenser with water reservoir
- o Buffer for diurnal storage
- o Heat pump
- o Solar thermal collector
- o Ground source



03 THERMOCHEMICAL HEAT STORAGE

In achieving the international goals of saving fossil fuels, reducing CO₂ emissions and protecting the climate, the cross-cutting technology of energy storage is of particular importance. Thermochemical energy storage, which is characterised by extremely high capacity and performance as well as low-loss and long-term stable heat storage, can make a significant contribution to this.

PRINCIPLE



A Thermochemical storage (TCS) is a reversible system which releases or absorbs thermal energy when two substances/components are combined or separated. If the components are stored separately, the corresponding reaction can be used to store heat. The basis for thermochemical heat storage is therefore the selection of a reaction system suitable for the desired storage temperature.

04 OBJECTIVES

- o Stable & compact materials: Energy density of more than 420 kWh/m³ (1.5 GJ/m³).
- o Long lifetime.
- o Affordable technology.
- o Efficient and high-power energy discharge: As high as 5kW for a single-family home.
- o Safe and reliable operation
- o To mobilize all the required key players in the supply and value chain from the material level up to the system level and the energy grid.

05 DEMONSTRATION

To demonstrate applicability of the thermochemical storage solution and its operation in real life conditions, a full scale solar TCS system delivered by the CREATE project has been installed into a single family house in Warsaw, Poland, where the land climate delivers both cold winters and warm summers.

