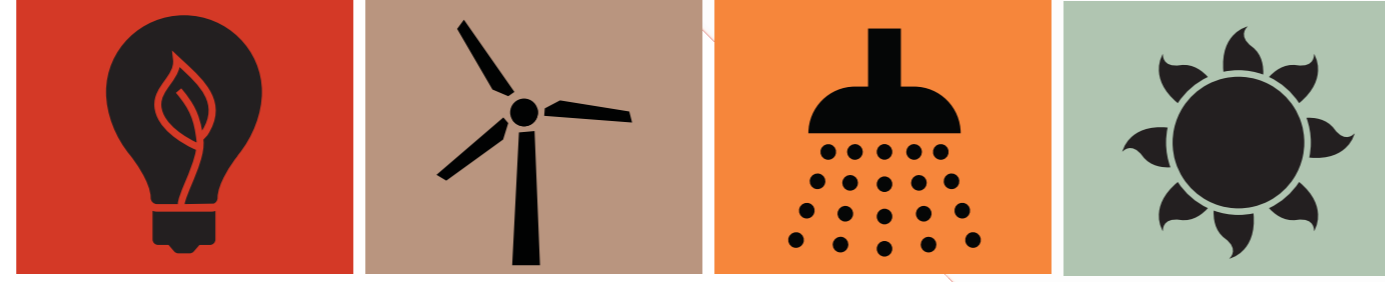




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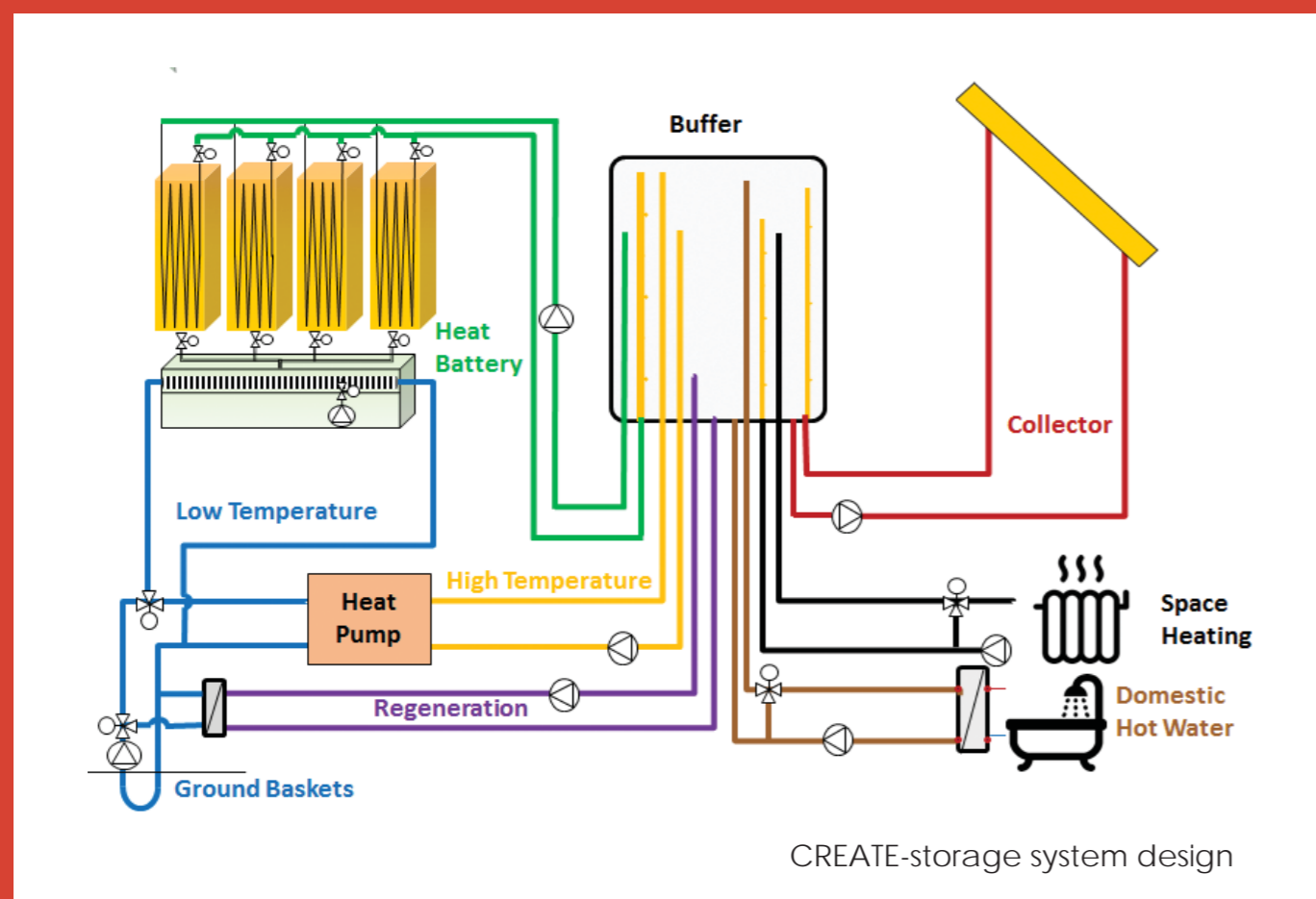


Compact **RE**trofit **A**dvanced **T**hermal **E**nergy storage

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

The main aim of CREATE is to develop and demonstrate a heat battery, i.e. 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 CREATE technology is a compact thermal energy storage system for the buildings sector. It will be the game changer in the transformation of our existing building stock towards near-zero energy buildings. The project will release the full potential of renewable energy by enabling effective integration of heat storage into Europe's building stock.



Thermo-Chemical Materials Development and testing

Thermochemical storage materials are best suited for seasonal thermal storage applications. Their thermal energy can be stored over months virtually without losses in form of the dehydration reaction heat. To select the starting material for the Thermo-Chemical Material (TCM), a database of approximately 600 hydrate reactions of salt hydrates has been made. From this list, K_2CO_3 was selected for further materials development. Up to 20 different TCM composites of K_2CO_3 have been made on lab-scale by DOW and CALDIC and extensively tested at the Eindhoven University of Technology. Based on the characterization results, two composites have been selected for further upscaling.



Main components of the CREATE storage system:

Heat Battery (seasonal storage)	Heat Pump
Absorber modules with thermochemical material	Solar Thermal Collector
Central evaporator/condenser with water reservoir	Ground Source
Buffer Storage (diurnal storage)	

CREATE is focusing the following sub-objectives:

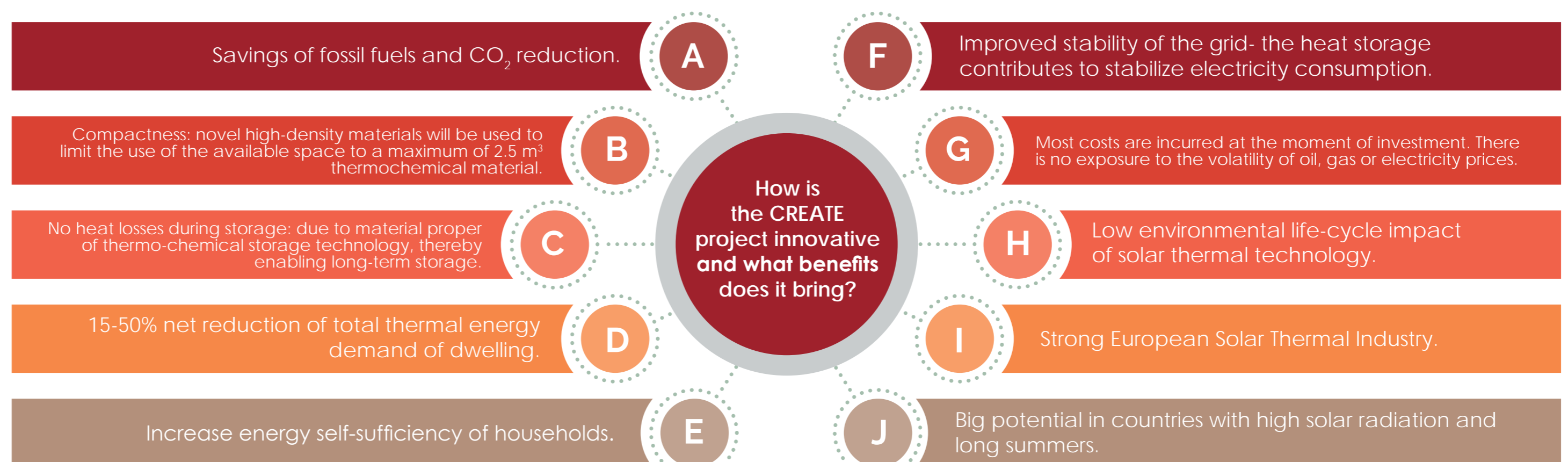
- Stable & compact materials**
- Long lifetime**
- Affordable technology**
- Efficient and high power energy discharge**
- Safe and reliable operation**
- Future value chain**

01 Objective

Considering that solar and wind energy are abundant, but inconsistently available, proper use requires storage to bridge the gap between supply and demand, i.e. the intermittent nature of renewables.

02 Objective

Heat storage can also increase the efficiency in the energy grid by converting electricity peaks into stored heat to be used later. In this way heat storage increases the energy grid flexibility (e.g. the seamless exchange of energy in different forms, giving options for tradability and economic benefits). Heat storage is therefore considered an indispensable element to facilitate flexibility in the energy grid.



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