Project presentation

Compact REtrofit Advanced Thermal Energy storage

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AEE INTEC

Event name

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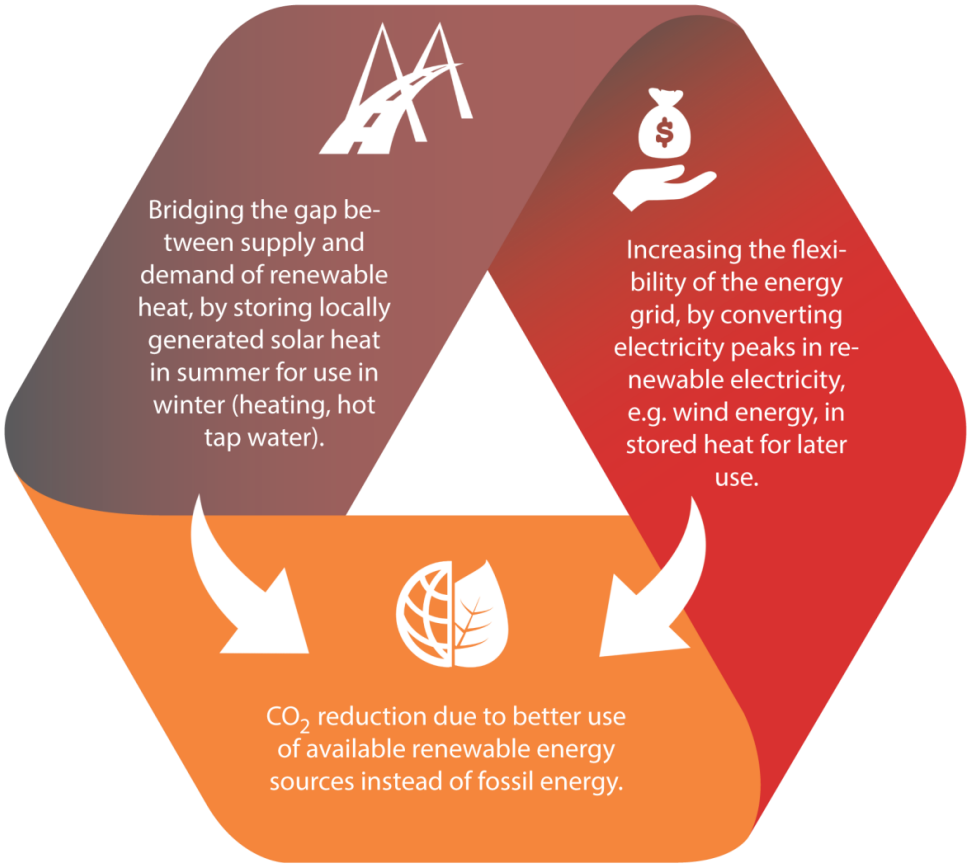
CREATE

Start date: 1st October 2015
Duration: 48 months

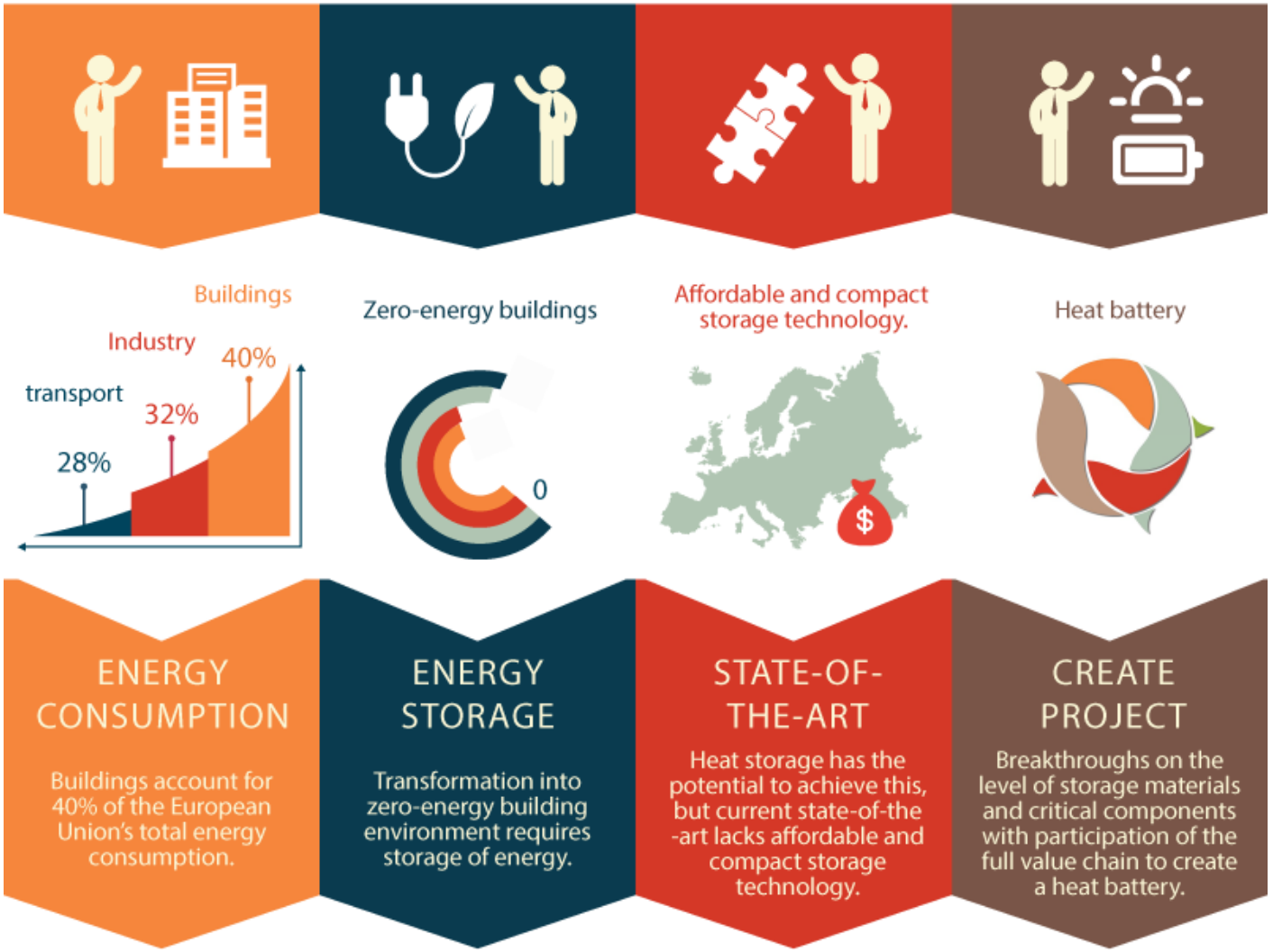
„Compact REtrofit Advanced Thermal Energy storage“

- CREATE is European Union research project under the topic EeB-06-2015 „Integrated solutions of thermal energy storage for building applications“.
- The Project aims to tackle the thermal energy storage challenge for the built environment by developing a **compact heat storage**.

The heat battery allows for better use of available renewables in two ways:

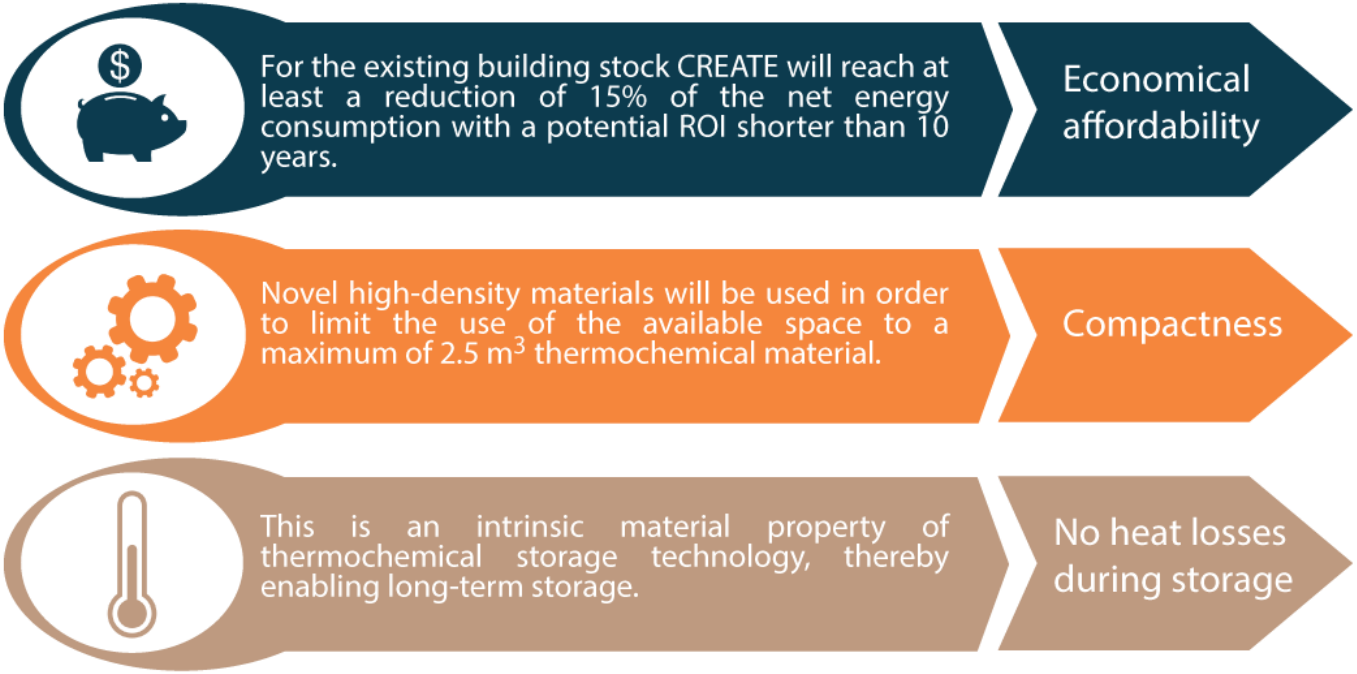


Introduction



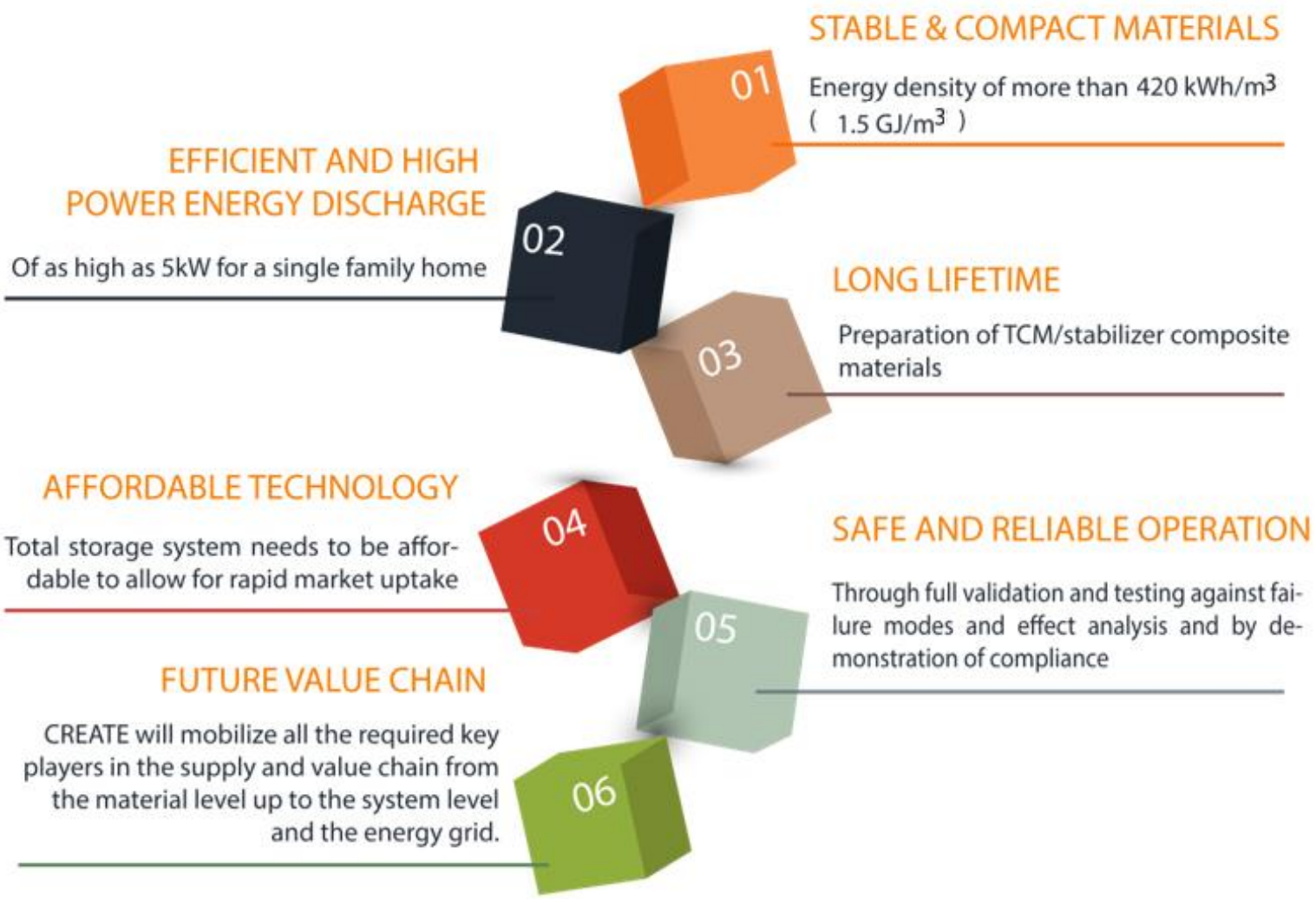
Project objectives

- To develop and demonstrate a **heat battery**, i.e. an advanced thermal storage system based on Thermo-Chemical Materials (TCMs), that enables:



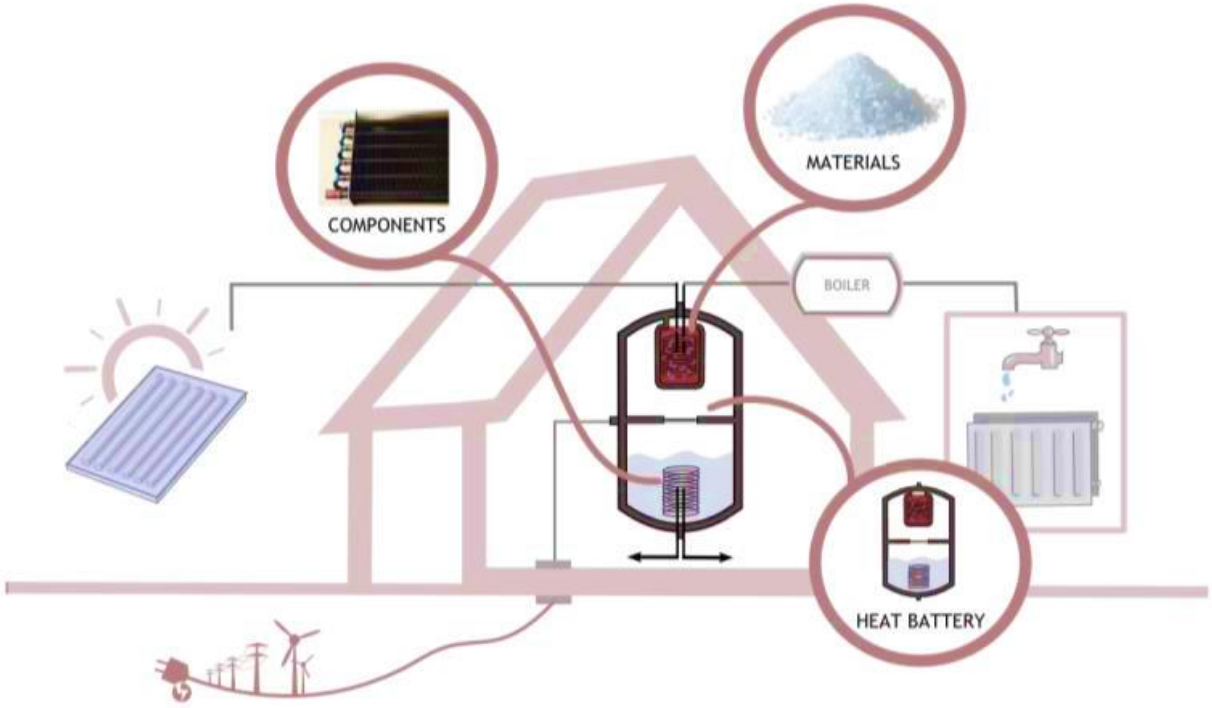
- To develop stabilized storage materials with high storage density, improved stability and low price, and package them in optimized heat exchangers, using optimized storage modules.

Sub-objectives



CREATE concept

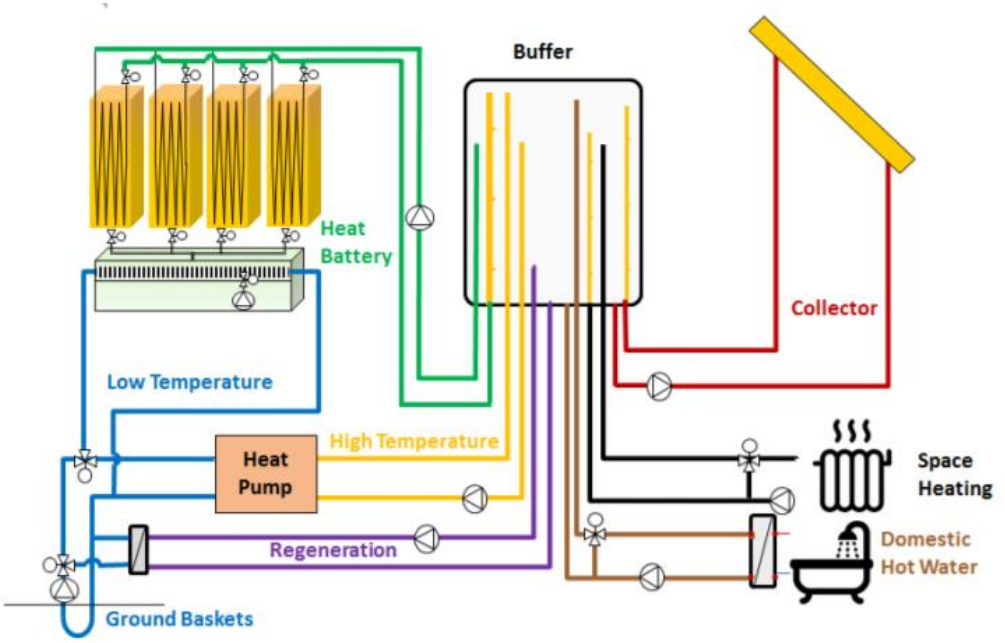
- The heart of the system is the heat storage module, i.e. the heat battery.
- Different sources for heat supply exist (heat generated by solar collectors on the building or heat-pumps fed by excess electricity from the grid).



Technology

The CREATE demo storage system design consists of the following main components:

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



Material development

A database of 600 hydrate reactions of salt hydrates based on material´s characteristics (energy density and the (un)loading temperatures) - K_2CO_3 selection

20 different TCM composites of K_2CO_3 tested in a lab-scale

Selection of the composite with the highest energy density in particle beds

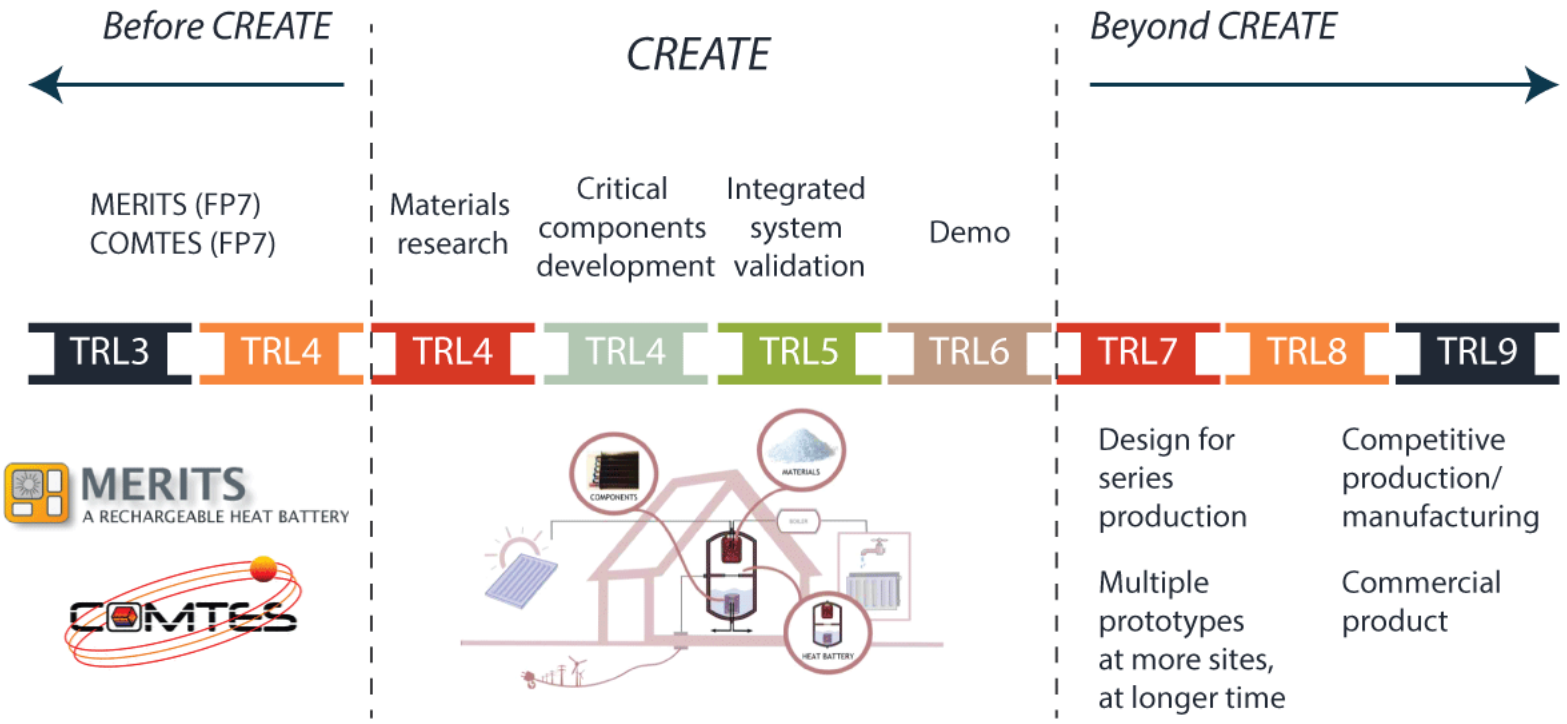
Further upscaling up to 100kg scale batches (suitable for industrial production)

Figure 1: The intermediate form of the composite salt

Figure 2: The final shape used in the 1 kg reactor which will be used in the functional scale module (FSM)

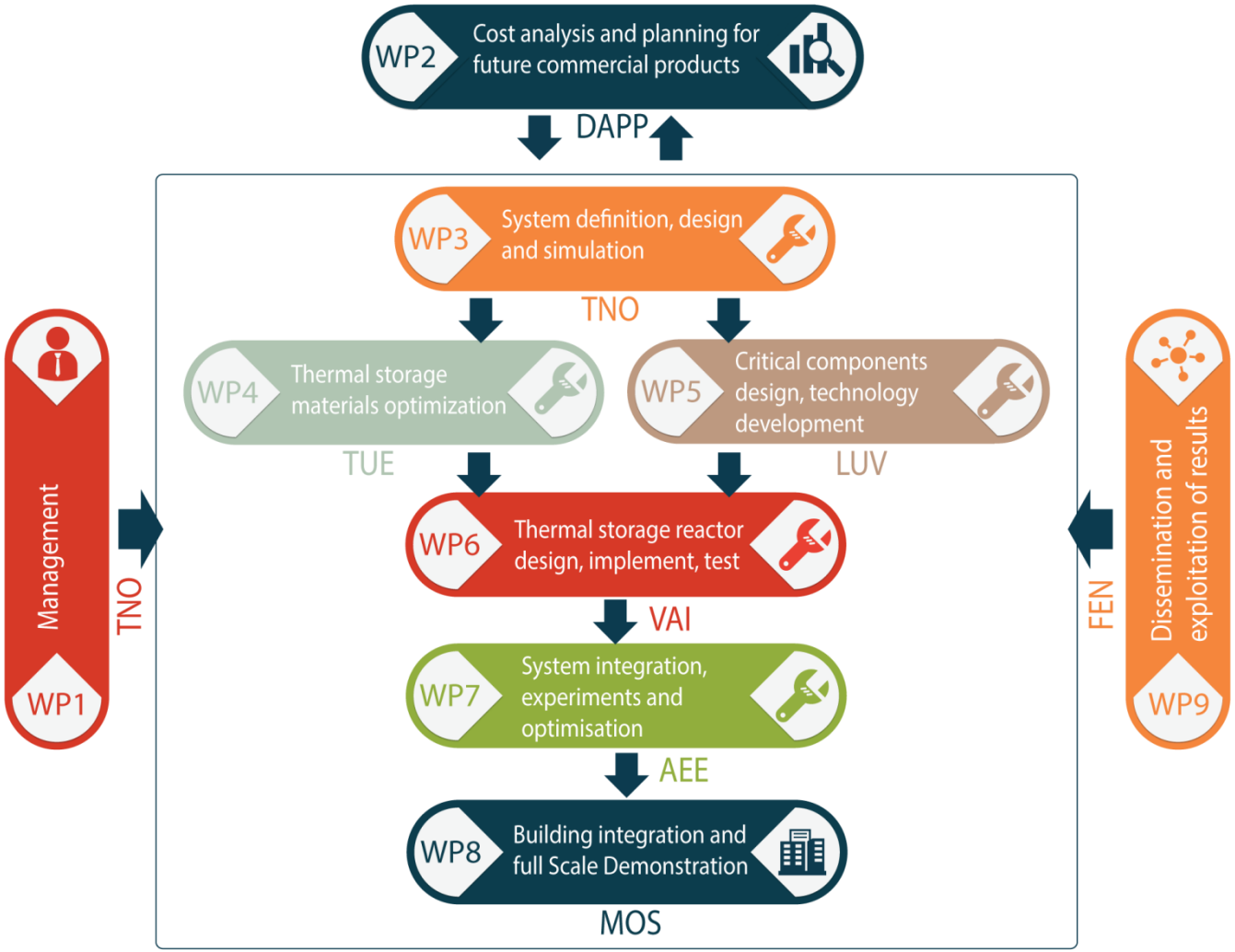
Perspective

- MERITS and COMTES cover R&D up to TRL 4 (lab-validated technology).
- CREATE delivers a demonstration of thermochemical storage for dwelling (TRL 6).
- Based on CREATE results, multiple prototypes to be tested, the design for series manufacturing and competitive production for commercialization will take place.



Workpackages

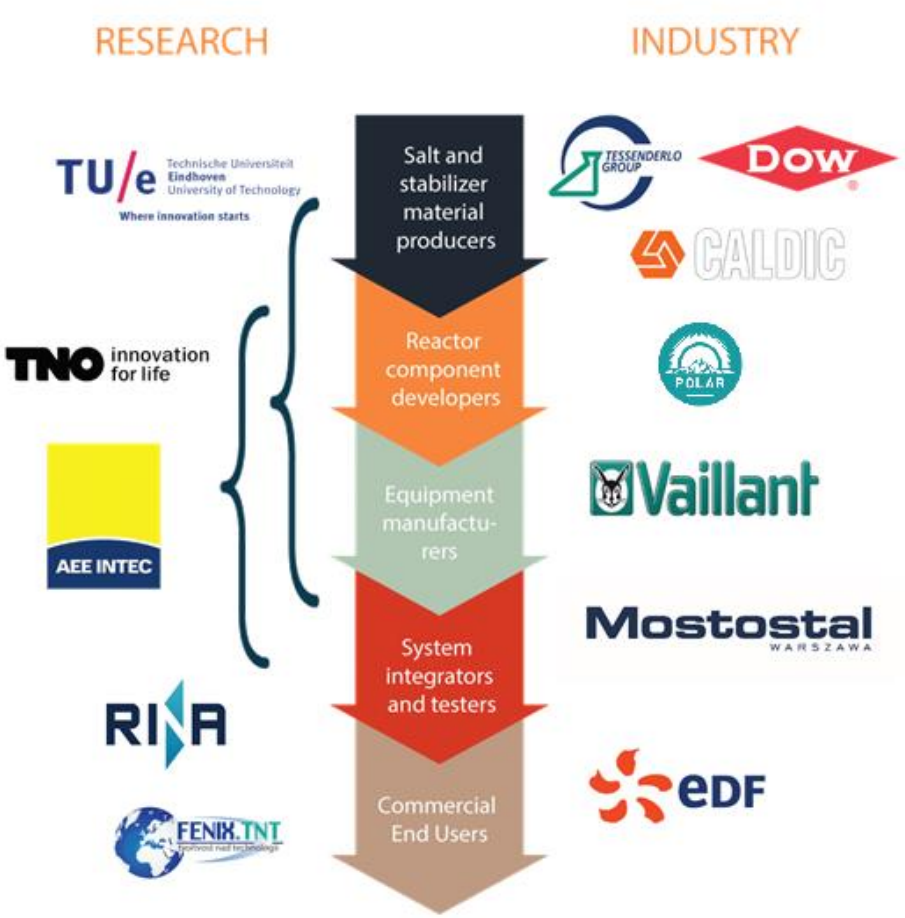
- The R&D work divided in 6 technical Work Packages (WPs).
- Additionally WPs for the project management, for commercial aspects and for dissemination.



Demonstration

- Implementation of the CREATE concept foreseen in typical European dwellings.
- Full scale solar Termochemical storage (TCS) system to be installed into a single family house in Warsaw, Poland by MOSTOSTAL.
- Demonstration of the TCS solution applicability and its operation in real life conditions (Polish land climate delivers both cold winters and warm summers).

Partners



- To ensure successful exploitation, the full knowledge, value, and supply chain are mobilized in the present consortium.
- The consortium consists of multidisciplinary parties, from universities, RTO's, material suppliers and end-user companies, enabling the necessary approach to scale up and commercialization.

Contact info

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