Newsletter
December 2022

Bringing advanced heat batteries in residential heat & electric systems closer to market through real life demonstration in different climates

Learn more about the HEAT-INSYDE project and its latest technology developments.

It's been a busy few months for the HEAT-INSYDE consortium, including the launch of our "Meet HEAT-INSYDE - Heat storage Q&A" online public events, a public workshop combined with a visit to the heat battery prototype in Eindhoven, advances in the technical developments of the battery itself and most recently the installation of one of the prototypes at the first demonstration site location in Eindhoven. Earlier in the year, the Energy Efficient Buildings (EeB) Public Private Partnership (PPP) published a report on the technological progress and innovations being developed by 103 projects co-funded under the Horizon 2020 programme between 2014 and 2020, and HEAT-INSYDE is one of them.

Read all about these latest developments in the following pages and mark your calendar with the suggested list of upcoming events.

As this year comes to a close, we wish you a wonderful Holiday Season and look forward to sharing more updates in the coming months. Enjoy the read and look out for the next issue of this newsletter in the first half of 2023 or subscribe to recieve it directly in your inbox!

IN THIS ISSUE

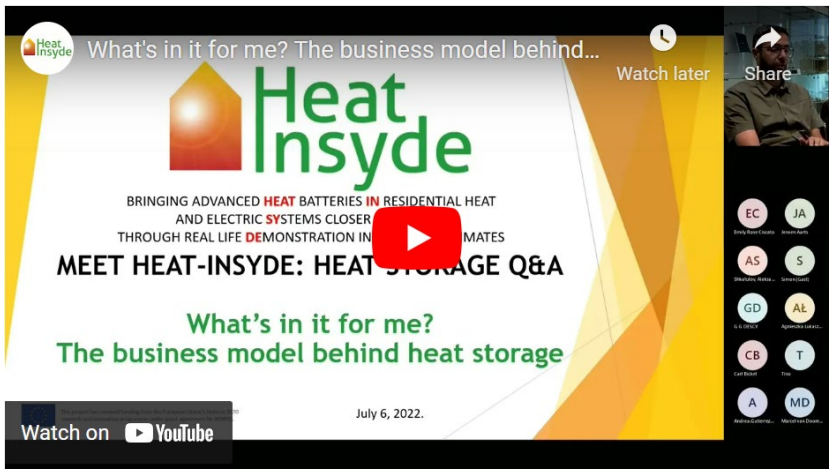
To keep up to date on the HEAT-INSYDE progress, visit our website and follow us on social media:

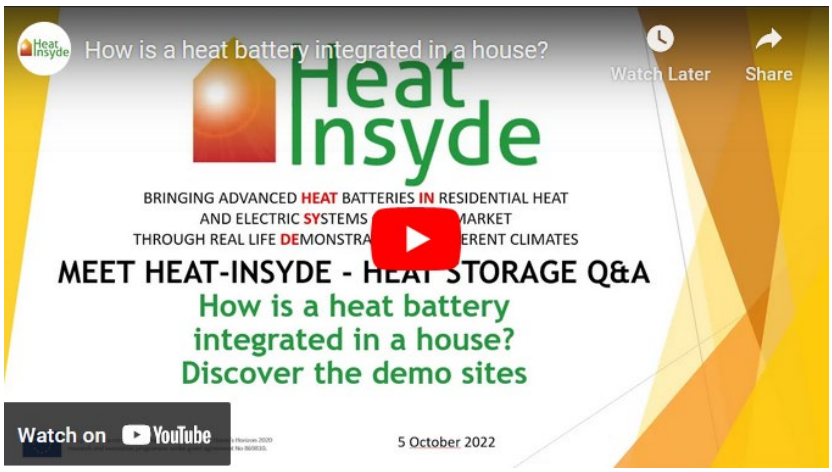
heat-insyde.eu
@HeatInsyde
HEAT-INSYDE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 869810.

Meet HEAT-INSYDE – Heat storage Q&A

In March 2022 we launched "Meet HEAT-INSYDE – Heat storage Q&A", an online event aimed at creating a two-way exchange between the project's partners and any stakeholder with an interest in heat storage. Each session focused on a specific topic presented by the project's experts, followed by an open Q&A with the audience. Three sessions took place in 2022.





To learn more, watch the recordings on our YouTube channel and find all questions and answers on the FAQ page on our website.

If you wish to be kept informed about HEAT-INSYDE events and Newsletters, subscribe here.

29 March 2022
How does heat storage work and why is it so cool?

- HEAT-INSYDE's heat storage solution
- Thermochemical material
- Hardware
- System integration

6 July 2022
What's in it for me? The business model behind heat storage

- Business model behind heat storage
- Curtailment

5 October 2022
How is a heat battery integrated in a house? Discover the demo sites

- The Netherlands
- France
- Poland

TECHNOLOGY HIGHLIGHTS

The latest heat battery prototype includes two component boxes above and below an evaporator/ condenser (left) and a more compact TCM module (20 boxes; right).

During past few months, the engineering team concentrated their efforts on integrating the various components of the system into a single package, thus reducing the footprint of the total system and by doing so achieving a higher energy density. Furthermore, better accessibility of components for maintenance was a key aspect taken into account during the re-design. The most significant change was the integration of the component boxes to the actual battery module; where previously these were separate modules it now forms one complete package.

Other areas of focus were the valving modules and the component boxes. The former is used to steer which TCM (thermochemical material) boxes are activated, the latter is the unit which contains the heat exchangers to extract the heat from the battery into the central heating system of the building. Finally, the placement of sensors and other items that would require maintenance was improved where possible to ease access.

One of the main challenges was related to the valving modules, but the team was able to overcome this, reducing the overall height of the system as well as the volume that does not consist of any TCM, thus allowing the heat battery to fit in rooms with lower ceilings and increase the energy density of the heat battery. Besides the smaller volume, a re-design was opted for to reduce the assembly time with regard to maintenance of the system and achieve more predictable valve operation. This required a new valve mechanism design.

For the component boxes, the internal space was optimised and an alignment tool for better positioning of the fans, spray nozzles and evaporator/condenser unit was added. An added challenge was to contain the operating pressures of the system during each heat cycle while adding minimum mass to reinforce the shell of the system.

To keep up to date on the next steps, follow us on the HEAT-INSYDE social media channels:

@HeatInsyde HEAT-INSYDE

HEAT-INSYDE INSIGHTS

The installation of a HEAT-INSYDE heat battery prototype at the first demonstration site in Eindhoven has started!
Early in the morning on the 12th of December, the heat battery, contained within a so-called smart heat shed (grey shed pictured on the right and below) was transferred from its test location at the University of Eindhoven to the end-users' house in Eindhoven (a row house owned by the HEAT-INSYDE partner Trudo). The transfer went smoothly and was completed within 3 hours.

After arrival of the heat battery at its final location, the installation of the water and electricity systems started. In the coming weeks, the entire heat shed will be connected to the house, which will not have an internal heating system and will fully rely on the HEAT-INSYDE system.

The full installation will be up and running at the start of 2023. Initially the full system will be tested, whereby the performance of the battery in relation to the entire heating system, solar panels, heat pump, radiators and tap water production will be analysed. The focus will lie on the storage capacity, discharge and charge rate and working temperatures.
For more info on the demo sites watch the full recording of the HEAT-INSYDE Workshop on Heat Storage Technology.

We look forward to sharing more updates on the demo sites in 2023 - stay tuned!

UPCOMING EVENTS

Online event
13 - 14 May 2023

MSE 2023 - Materials Science Engineering

MSE is one of the largest English-speaking congresses in the field of Material Science and Engineering across Europe. The technical programme is currently in preparation. Paper submission deadline is now open until 24 December 2022. Authors will be notified on the status of their submission by 26 January 2023 and in case of accepatance, registration and camera-ready paper are due by 8 February 2023.

Hybrid event
20 - 22 June 2023
Brussels, Belgium and online

European Sustainable Energy Week 2023

Open to a broad audeince, including international organisations, university associations, national and local authorities, professional associations, sustainable development NGOs, consumer associations, research organisations, EU-funded projects, and more, the event will include a policy conference, an Energy Fair with stands and the fourth edition of the European Youth Energy Day. A series of locally-organised Sustainable Energy Days will also be taking place around the world in the leading-up days to the event.

On-site event
18 - 20 September 2023
Bari, Italy

International Conference on Sustainability in Energy and Buildings SEB-23

The conference aims to bring together researchers, government and industry professionals to discuss the future of energy in buildings, neighbourhoods and cities from a theoretical, practical, implementation and simulation perspective. Deadlines for registration and abstract submission are still to be defined.

On-site event
10 - 12 October 2023
Brussels, Belgium

ESGC 2023 - Energy Storage Global Conference

Previously taking place every two years and now organised as an annual event due to the gaining momentum of energy storage, ESGC is an international conference reknown for bringing together the latest insights on energy storage's policy, market and technologies and applications.

ENERGY EFFICIENT BUILDINGS

The Energy Efficient Buildings (EeB) Public Private Partnership (PPP) is a joint initiative of the European Commission (EC) and the construction industry. The recently published report from EeB PPP presents the progress of 103 projects co-funded under the Horizon 2020 programme between 2014 and 2020 and HEAT-INSYDE is one of them. The projects demonstrate scientific and technological excellence, across the whole **value chain of technology readiness level (TRL)**, from early stage conception to demonstration of almost ready-to-market innovations. Categorised into **seven technology clusters:** Design, Technology Building Blocks, Advanced materials and nanotechnology, Construction process, Energy performance monitoring & management, Information and Communication Technology and Building Information Modeling. HEAT-INSYDE is featured in two clusters.

Energy performance monitoring and building management (EPMBM) one of the most effective mechanisms to achieve deep energy renovation. HEAT-INSYDE tackles the energy performance gap and provides decision support as one of the six EU-funded projects. This is thanks to Battery Management System solutions applying plug-in play analytics and modular systems.

There are 55 projects in the EPMBM cluster giving an average TRL of 5.9.

Technology Building Blocks (TBB) though challenging is one of the most important factors impacting the whole building stock energy balance. Currently, about 35% of the EU's buildings are over 50 years old and almost 75% of the building stock is energy inefficient, but only a small share is renovated each year due to difficulties in approaching the renovation process. HEAT-INSYDE is among six projects developing thermal systems which will contribute to the whole building stock energy balance and make achievable the climate neutrality goal by 2050.

There are 42 projects in the TBB cluster giving an average TRL of 5.9.

Read the full report here:
EeB PPP Project Review 2021

TRLs 1-9 are used to assess the maturity level of a particular technology.