Newsletter
June 2021

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

WELCOME

You are reading the very first HEAT-INSYDE Newsletter!

HEAT-INSYDE is an EU-funded project that is developing an affordable, compact and sustainable heat storage solution (heat battery). Renewable energy generation, e.g., through wind turbines and solar panels, has a major disadvantage: it is weather dependent, meaning that supply does not always meet demand. The HEAT-INSYDE technology brings a solution to make use of renewable energy also on windless and cloudy days, storing energy for on-demand use. The collaboration, experience and expertise of 12 research and industry partners from 6 European countries brings this project to life. The joint venture of HEAT-INSYDE started in October 2019 and over 4.5 years aims to deliver a tested heat battery prototype capable of flexibly connecting to various energy systems, from the municipal electricity grid and heat networks to domestic, privately owned heat pumps and solar panels, enabling a smoother transition to the use of clean, sustainable energy.

This newsletter is the first of a series that will be released on a six-monthly basis, through which we will bring to you the latest news from the HEAT-INSYDE partners as well as related insights.

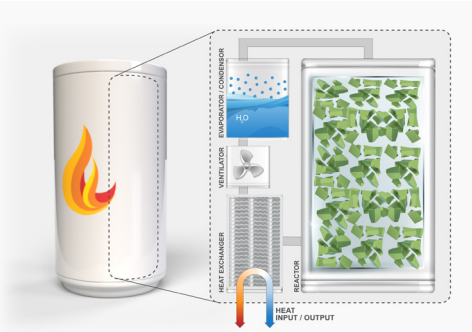
IN THIS ISSUE

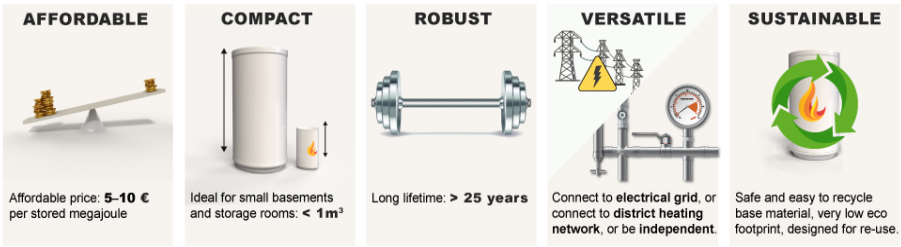
Before diving into the technical details, in this issue we present a broad introduction, including:

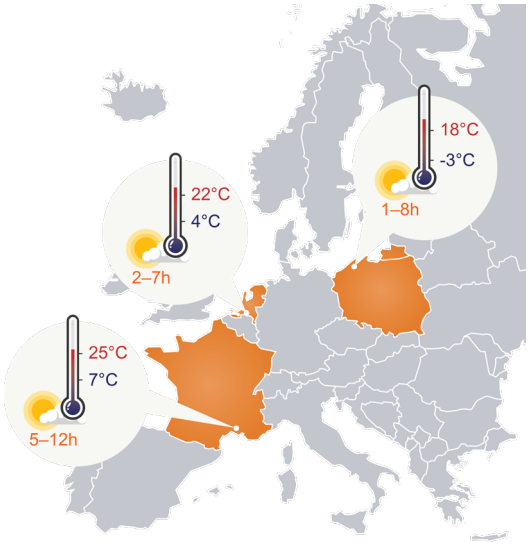
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 869810.

HEAT-INSYDE IN A NUTSHELL

The HEAT-INSYDE battery will store energy via a groundbreaking technology based on the thermochemical properties of potassium carbonate (a non-toxic salt) and a closed-loop reactor system. When charging, energy will be brought into the system in the form of heat that dehydrates the salt, thereby storing energy within it. Re-hydrating the salt will make the energy available for use.







To learn more stay tuned for the next newsletter, visit our website and follow us on social media.

heat-insyde.eu
@HeatInsyde
HEAT-INSYDE

HEAT-INSYDE will bring clean energy when you need it.

The technology will be validated in real houses located in 3 European climate zones.

THE EUROPEAN COMMISSION AND ENERGY RESEARCH

Why does the EU support research and innovation in energy?

Today, energy generation accounts for more than 75% of the EU's greenhouse gas emissions.

To reach climate neutrality, there is a need to decarbonise at least 6 times faster than anything realised globally so far. According to the European Commission (EC), we must drastically increase the share of renewable energy sources and clean energy carriers, and improve energy efficiency. Importantly, the energy transition must be just and inclusive or it will not happen at all. Citizens need not only clean, but also affordable, secure and safe energy.

How does the EC address challenges in energy?

The EC presented specific initiatives aimed at tackling the energy challenges and achieving climate neutrality in Europe by 2050.

The EC funds research and innovation through a dedicated programme that is renewed every 7 years. Between 2014 and 2020 this was Horizon 2020, under which the HEAT-INSYDE project received its funding. As of 2021 the new programme is named Horizon Europe and includes a specific focus (*cluster*) for research on climate, energy & mobility. This cluster supports research aimed at fighting climate change by better understanding its causes, evolution, risks, impacts and opportunities, while making the energy and transport sectors more climate- and environment-friendly, efficient, competitive, smart, safe and resilient.

Horizon Europe also includes *missions*. These are commitments to solve some of the greatest global challenges, providing clearly defined targets to steer the projects and initiatives funded. One of the proposed missions is "*100 climate neutral cities by 2030 -by and for the citizens*", through which 100 European cities will be supported, promoted and showcased in their transformation to climate neutrality by 2030, making them innovation hubs and leading Europe's efforts to achieve climate neutrality by 2050.

In December 2019, the EC launched the European Green Deal, its strategic plan of policy initiatives and concrete actions to make Europe climate neutral by 2050 (more on the next pages).

Every year the EC organises the Green Week, Europe's biggest annual conference on environment policy, focusing also on energy. This year, the European Green Week 2021 was dedicated to the 'zero pollution ambition' and as such presented an opportunity for interested citizens and a broad range of stakeholders to exchange knowledge, ideas and best practices for how we can work together towards a zero pollution and toxic-free environment.

THE EUROPEAN GREEN DEAL

Green Deal goals

Through the European Green Deal, the EC has committed to placing sustainability and the well-being of citizens at the centre of its economic policy. Indeed, the Green Deal has the following aims:

- Achieve no net greenhouse gas emissions in 2050;
- Decouple economic growth from use of resources for a clean and circular economy;
- Protect, conserve and enhance the EU's natural capital, its ecosystems and biodiversity;
- Protect the health and well-being of citizens from environment-related risks and impacts;
- Supply clean, affordable and secure energy;
- Build and renovate in an energy and resource efficient way;
- Support a fair, healthy and environmentally friendly food system;
- Accelerate the shift to sustainable and smart mobility.

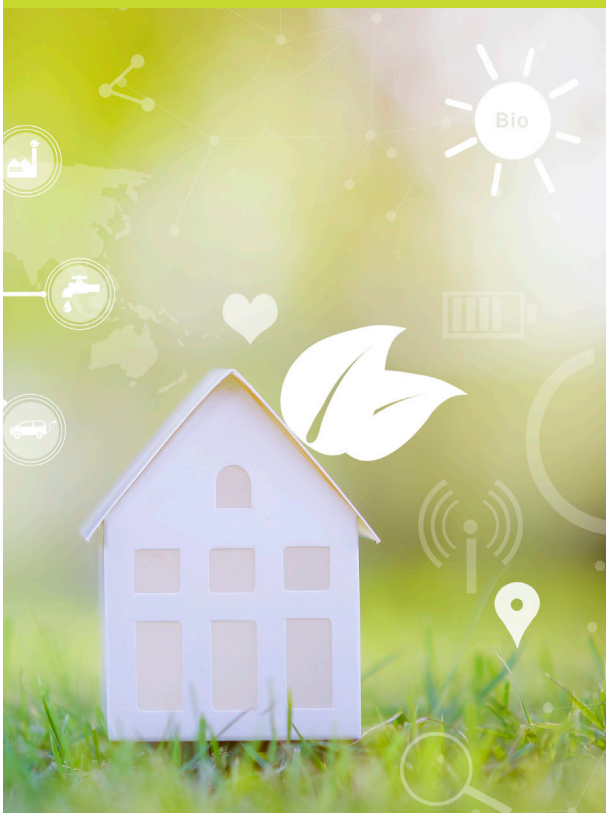
Green Deal priorities for the energy sector

Further decarbonising the energy system is critical to reach the Green Deal goals and its climate objectives for 2030 and 2050. As part of this, the EC has outlined several priorities, including the following.

Use of smart infrastructure. The energy infrastructure regulatory framework will be reviewed in line with the climate neutrality objective and to foster the deployment of innovative technologies and infrastructure, including energy storage, also enabling sector integration.

Engage in a building 'renovation wave'. The EC suggests that EU Member States should at least double the renovation rate of buildings as a way to reduce energy bills, increase energy efficiency and improve the overall energy performance of buildings. The Renovation Wave strategy was launched by the EC in October 2020 and brings several opportunities for the energy storage sector.

Read the full Renovation Wave strategy report here:
ec.europa.eu



HEAT-INSYDE INSIGHTS

The HEAT-INSYDE project is in its second year now and the excitement is high among partners, as they are working hard to prepare the first test-ready prototype of the HEAT-INSYDE battery. They've also been keeping busy presenting the HEAT-INSYDE technology at international conferences and workshops.

Read on to see what Project Manager Francesco Pizzocolo recently had to say about the project's progress and to learn about the latest events that project partners joined.

Francesco Pizzocolo (TNO)
Project Manager of
HEAT-INSYDE

A first glimpse inside HEAT-INSYDE

How does HEAT-INSYDE contribute to the EC's priorities for the energy sector?

Our project is pushing to the market a technology for heat storage that is affordable, sustainable and that perfectly integrateswith the existing renewable energy resources, such as solar, wind and geothermal.

If you had to describe HEAT-INSYDE with two adjectives, what would those be?

Collaborative and future-proof.

What challenges is the HEAT-INSYDE project facing?

Maybe it's a boring answer by now, but we are still busy recovering from the delays created by the global pandemic.
From the technical side we need to make the battery very easy to assemble and use at the demo sites, also by non-technically skilled people. And reduce the maintenance costs as much as possible.

What excites you the most about the HEAT-INSYDE project?

That the first complete user-ready prototype of the heat battery (with a new design) is going to be ready at the end of June 2021! I'm also very much looking forward to seeing the batteries installed at the three demo sites in the Netherlands, France and Poland.

HEAT-INSYDE at the European Association for Energy Storage (EASE) workshop on the role of energy storage in the Renovation Wave and at the National Renewable Energy Laboratory (NREL) Thermal Energy Storage Systems for Buildings Workshop.

On 22 April 2021, over 90 participants attended the workshop on the role of energy storage in the Renovation Wave organised by EASE. As highlighted by the organisers, energy storage is a key enabler of energy efficiency and grid flexibility and as such plays a key role towards the success of the Renovation Wave. The HEAT-INSYDE project is hence ideally placed to make a difference in the energy sector and its innovative technology was presented at the meeting by Ruud Cuypers (TNO).

The project also made an appearence at the NREL Thermal Energy Storage Workshop, held on 11-12 May 2021, during which Pim Donkers (TNO) had the opportunity to present about it to the 760 attendees and Gilbert Descy (BE-SOL) represented the project participating in all sessions.

The workshop was a great opportunity to learn about the most recent drivers in the thermal energy storage market in the United States but also in Europe and other countries. Most technologies presented provide solutions for heat storage durations of 4 to 12 hours on a daily cycle. From the economic perspective, the market development is driven by a payback time of between 3 to 5 years, for which the HEAT-INSYDE technology still needs to up its game to be ready for market introduction towards the end of the project during the course of 2024.

Pim Donkers (TNO)
Leader of HEAT-INSYDE Work Package 2 - System definition and requirements

Gilbert Descy (BE-SOL)
Leader of HEAT-INSYDE Work Package 4 - Components

UPCOMING EVENTS

Hybrid event
21 - 25 June 2021
online
22 - 24 June 2021
Wels, Austria

World Sustainable Energy Days

Over 5 days, the event offers 6 dedicated conferences, including the European Energy Efficiency Conference, the Energy Efficiency Policy Conference, the Industrial Energy Efficiency Conference and the Young Energy Researchers Conference.

On-site event
19 - 20 August 2021
London, United Kingdom

ICTEST 2021: 15. International Conference on Thermal Energy Storage Technologies

The conference aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results on all aspects of Thermal Energy Storage Technologies. Listener registration still open!

On-site event
15 - 17 September 2021
Split, Croatia

International Conference on Sustainability in Energy and Buildings SEB-21

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. Registration is still open!

On-site event
15 - 17 September 2021
Split, Croatia

8th International Conference on Sustainable Design and Manufacturing

SDM-2021 will consist of keynote talks, oral presentations, invited sessions and workshops. It will cover the theory and applications of sustainable design and manufacturing, and related areas. Registration for non-authors is still open.

On-site event
6 - 8 October 2021
Bilbao, Spain

9th International Conference on Energy and Sustainability

The conference will cover various topics, including energy networks, new energy resources, storage solutions, waste to energy systems and smart grids.

INTERESTING READ

The International Energy Agency recently published a report on patents and the energy transition, presenting global trends in clean energy technology innovation.

In March 2021 top international energy and climate leaders took part in the IEA-COP26 Net Zero Summit, a key milestone in accelerating international collaboration toward clean energy transitions. Many of the governments present, who represented more than 80% of global GDP and the majority of global energy use and greenhouse gas emissions, highlighted the urgent need to increase the pace and scale of adopting low-carbon technologies, and emphasised that significantly greater private and public investment is needed to quickly harness commercially-available technologies, and to identify and develop breakthrough technologies.

Key findings of the study were:

- Innovation in low-carbon energy (LCE) technology has resumed growth since 2017;
- Low-carbon energy (LCE) innovation is shifting from supply to end-use and enabling technologies;
- Electric vehicles are driving the dominance of end-use technologies in low-carbon energy (LCE) patenting;
- Countries are specialising nationally and collaborating internationally to foster local technology advantages.

Read the full report available here:
www.iea.org/reports/patents-and-the-energy-transition