



# The Role of Energy Storage in the Renovation Wave

Strategy to Increase Energy Efficiency in Buildings Through Renovation and Innovation Solutions

May 2021



# The Role of Energy Storage in the Renovation Wave

## Introduction

In October 2020, the European Commission launched its [Renovation Wave strategy](#), to increase the energy renovation rate of buildings and significantly improve the overall energy performance of the EU building sector. This strategy brings opportunities for the energy storage sector, considering the invaluable role of energy storage for energy efficiency.

EASE held a workshop on 22 April 2021 to address the role of energy storage in the Renovation Wave. It had the European Commission presenting the strategy and the next steps and presentations from two EASE members to showcase their projects contributing to the Renovation Wave. The presentations from the energy storage sector were each followed by opportunities for discussion and reflection.

## Renovation Wave Raising the Bar on Energy Efficiency

The workshop was kicked off with a presentation giving a comprehensive overview of the Renovation Wave from Nina Neumann – Legislative Development and Enforcement Team Leader in DG Energy Unit B3 in the European Commission.

Ms Neumann explained the problem that the Renovation Wave aims to address. The current building stock in the EU is largely inefficient and the energy renovation rate is low. At the current pace of building renovations, it would take centuries to decarbonise the building sector in line with the climate neutrality goal. The strategy requires joint efforts at all levels: at EU, national and local level, from industry and individual citizens. The Renovation Wave requires an integrated approach, including energy storage, which helps to optimise energy efficiency. Energy storage provides many important functions, and is particularly useful at the community and neighbourhood level.

Following the presentation, a question was asked to which extent the Member States are focusing on renovation in the national recovery plans, considering that NextGenerationEU offers unprecedented resources. Ms Neumann explained that the Commission has been in active dialogue with Member States in order to ensure that the national recovery plans provide for sufficient resources for building renovation.

### European Renovation Wave Strategy

On 14 October 2020, the European Commission published "[A Renovation Wave for Europe – Greening our buildings, creating jobs, improving lives](#)" (COM(2020)662). The strategy aims to at least double the energy renovation rate of buildings and to foster deep energy renovations.

### Relevant Legislation

The Renovation Wave is put into action, inter alia, by the revisions of the [Energy Efficiency Directive](#), the [Renewable Energy Directive](#), and the [Energy Performance of Buildings Directive](#).

### Role of Energy Storage

Energy storage is important for the success of the Renovation Wave, as a key enabler of energy efficiency and grid flexibility. The decarbonisation of the heating and cooling sector is a key focus area, and the creation of smart buildings and energy communities are goals of the strategy.

# Energy Communities: Citizens' Untapped Potential to be Active Players in the Energy System

For the first presentation showcasing projects from the energy storage industry, Luigi Lanuzza, Head of B2C and B2B Innovation Factory at Enel X, presented an overview of Enel's projects on Energy Communities.

Mr Lanuzza described how the energy sector is changing towards decarbonisation from the utility's point of view, and how value is shifting from commodity to services.

## Two Projects Highlight Different Challenges

The first project to show was a residential aggregation pilot project in Lombardy, Italy, where many batteries are owned by residential customers, linked as distributed energy resources to help balance the grid. Interoperability is the key in this project, which is a largely successful service but is highly complex and offers limited remuneration for customers. Moving to energy communities, Mr Lanuzza explained the two types, and presented Enel's pilot project of a self-consumption energy community in a condominium. This requires a high number of smart meters in order to offer the most information and energy efficiency. Projects like this face limitations on maximum power and on the physical perimeter, representing a barrier to fast deployment, along with restrictive consumer typologies.

## Should We Keep in Mind Anything Else, Regarding Barriers?

At the conclusion of the presentation the audience were split into breakout rooms to share their thoughts. The guiding question was: With the empowerment of the consumer as a key aspect of the Renovation Wave, what is needed to inspire this change of culture for consumers to create energy communities with renewables and storage?

The discussions raised several important points. One group concluded that if the community has to invest themselves to the project and some members of the community are not willing to make the investment risk for the necessary equipment, then there is very little chance that an energy community will develop. This could be avoided if the necessary elements are already included in new apartment buildings, so that the investment is already done when buying an apartment, rather than an addition to the apartment. Another group proposed that consumer engagement is not necessarily the problem, noting that the majority of heating in Europe is controlled by the consumer by apartment or by building, so energy could be treated like this as well. Rather, the lack of engagement comes from a lack of understanding of the benefits, and the steps to take to create energy communities, especially as it is often different on a case-by-case basis.

After the discussion poll was launched, asking to identify the biggest barriers to energy community creation. Lack of awareness was the most voted result, alongside high upfront cost. Reflecting on the poll results, Mr Lanuzza remarked that the results were quite predictable considering the experience Enel X had with these projects, and that lack of awareness is a problem at every level. He noted that the other barriers depend heavily on state and region as well.

# Thermal Energy Storage: the Road to Decarbonise Heating and Cooling

The second presentation from the energy storage industry was given by Ruud Cuypers, Senior Scientist and Program Manager for Thermal Energy Storage at TNO, who provided 2 examples of TNO's projects on thermal energy storage based on thermochemical materials.

## The Technology is Out There

Mr Cuypers began by explaining the value and functionality of thermal energy storage systems. The benefits heat batteries offer include decentralised, compact energy storage, with low loss potential and longer storage periods, technically indefinite if the water is kept separated from the chemical compounds. These batteries are scalable in size depending on need, and can be used flexibly for both heating and electricity. This is being demonstrated by two EU funded projects - Heat Insyde, and Self Supporting Urban Smart Grid (SSUSG). Heat Insyde is a demonstration in 3 different climate zones in 6 EU countries, and showcases the flexibility potential of the technology. SSUSG demonstrates the technology with 2 loss free modules powered entirely by solar, compact enough for a tiny house, in the Netherlands. He summed up the presentation by explaining the importance of thermal energy storage to the Renovation Wave strategy - thermal energy storage can be integrated into existing infrastructure, for both heat and electricity, making it ideal for retrofits during renovations, and its use of cheap and abundant materials.

## The Drivers for Thermal Energy Storage Deployment

With the conclusion of the presentation the audience were split into breakout rooms once again to share thoughts. The guiding question was about the driving forces for the use of thermal energy storage, and how they may be different depending on scale.

One point was made from experience, that the driving factor came from the benefits it provided, rather than traditional market indicators of return on investment. The environmental benefits of transitioning away from fossil fuels and creating a better world, and for the prospect of energy independence. The benefit that thermal energy storage can be easily integrated into existing heating and electricity infrastructure also drives the deployment of the technology, both small and large scale, given its contribution to grid flexibility. The discussion also brought up the fact that the research and development of thermal energy storage is quite a small community in the EU, potentially limiting its rapid and widespread deployment.

A poll question was again launched, aimed at identifying the barriers to the widespread deployment of thermal energy storage. Lack of awareness was again the most prominent barrier. Mr Cuypers added that this is something TNO, as a research centre can work to address, by disseminating the successful results of the projects to a wider audience. The participants also found that a non-supportive legal framework creates a barrier for deployment. Mr Cuypers agreed, and explained that thermal energy storage is often excluded in legal frameworks for energy storage because it is a unique technology that does not fit the definitions for energy storage systems.

# Key Takeaways: the Technology is There, Now the Remaining Barriers Must Be Cleared

With the conclusion of both presentations, the key takeaways of the event were presented by Ms Beatriz Sinobas, Energy Security and Electricity Team Leader at DG Energy Unit B4, the European Commission.

She explained that the energy system we are heading to needs more flexibility to ensure security of supply. Energy storage linked with digitalisation can be very useful to deliver energy flexibility options, and the presentations showcased that very well. The Renovation Wave is now in full rollout, and its success is necessary to meet EU climate targets.

From the first presentation, the overall shift in the market towards services and the practical configuration of the two energy communities projects was useful to understand. She highlighted that batteries face certain practical barriers, which can also hinder the development of energy communities, along with the other discussed options. Considering thermal energy storage, its use as a flexibility service is very valuable as an energy storage technology. The issue of thermal storage in legal framework is especially valuable to learn of, and is something the European Commission can examine in future work. Reflecting on the two poll questions, she noted that lack of awareness is an issue for both technologies, which shows that these new technologies and flexibility options need to be better advertised across the Union. On a positive note, it was very clear that the technology is available – it is developed and proven.

She added that the European Commission is monitoring barriers and the implementation of energy storage, and has [published a study](#) on this. In conclusion, she thanked the presenters, organisers and audience for the useful information that the European Commission can take into consideration in the next steps to meet the climate goals.

## The next steps

EASE is grateful to all presenters and participants of the webinar and is looking forward to continued cooperation with the European Commission in supporting the role of energy storage use for the Renovation Wave.

# Notes

A series of horizontal dotted lines for writing notes.

\*\*\*

About EASE:

The European Association for Storage of Energy (EASE) is the leading member - supported association representing organisations active across the entire energy storage value chain. EASE supports the deployment of energy storage to further the cost-effective transition to a resilient, carbon-neutral, and secure energy system. Together, EASE members have significant expertise across all major storage technologies and applications. This allows us to generate new ideas and policy recommendations that are essential to build a regulatory framework that is supportive of storage.

For more information please visit [www.ease-storage.eu](http://www.ease-storage.eu)



**European Association  
for Storage of Energy**

Avenue Adolphe Lacombé 59/8  
1030 Brussels | Belgium  
Tel: +32 2 743 29 82  
@EASE\_ES

[www.ease-storage.eu](http://www.ease-storage.eu)  
[info@ease-storage.eu](mailto:info@ease-storage.eu)

