Interreg CENTRAL EUROPE

STORE4HUC

ENERGY STORAGES AT HISTORICAL URBAN SITES

WHAT WE DO

The project Store4HUC develops solutions for renewable energies and their storage in historical buildings. It is not always easy to supply listed buildings with renewable energy and to store that energy: visible changes to the building are not possible and the subsequent installation inside the buildings is often difficult. This calls for imaginative solutions.

10 PROJECT PARTNERS

6 ASSOCIATED PARTNERS

5 COUNTRIES

1.4 MILION EURO ERDF

1.7 MILION EURO PROJECT BUDGET

TAKING **COOPERATION** FORWARD

CENTRAL HEAT STORAGE IN WEIZ, AUSTRIA

In 1999 a local heating network and heating plant were built in Weizberg. This plant supplied 12 costumers, the largest of which is a hotel and the parish of Weizberg.

The heat supply was ensured by two biomass boilers that were running on regional wood chips. The previous operation of the boiler system of the heating plant had to be operated mostly in the partial or low load range, with increased fuel consumption and pollutant emissions.

Therefore, a central heat storage was integrated into the existing heating plant, despite the location which is a district protected by historical monuments and sites.

Another innovative approach was implementating a new regulation with a fully integrated, intelligent load management. Through the mutual communication of all system components including access to the control of decentralized storage systems at the customers, a holistically optimized operation of the heating plant and the local heating network was implemented.

CENTRAL BATTERY SYSTEM IN BRAČAK MANOR, CROATIA

The aim of the Bračak pilot project was the implementation of a central battery (bank) system, installation of a photovoltaic system, and integration of it to an advanced Energy management system (EMS).

Bračak Manor was already equipped with energy management systems. The system was combined with the existing ones, to act as decision support such that the operators can decide ahead how to engage micro-CHP and the wood pellet boiler in the presence of newly installed photovoltaic and battery system.

With the EMS integration the photovoltaic and battery system now have the ability to display all important operating parameters, such as the current production of PV, total energy produced [kWh] trough time, etc.

With these data it is possible to adjust energy flows, control load management and/or peak shaving and to coordinate the energy systems and to predict and manage costs. Energy management also allows to investigate what are the economically and ecologically most favourable technology mixes on historical sites.

PARAFFIN BASED LATENT STORAGE IN LENDAVA, SLOVENIA

Slovenian pilot is a paraffin based latent storage in connection with geothermal district heating system in the city of Lendava located in north-eastern part of the country. The aim has been the installation of innovative paraffin based latent heat storage and connect it to an existing grid in Lendava on the geothermal heating system.

The storage is installed in the old neo-baroque villa built in the 1906. This building is one of the last public buildings which used to be heated on fossil fuel (heating oil). It has had a very poor energy performance as it was using an old heating boiler.

The library is the last connection in the geothermal grid (the temperatures here are around 50°C) and is historically protected. The aim of this project is to reduce the fossil fuel to zero, CO2 reduction was between 25 and 28 tons per year. The construction work has been carried out in two phases, first, connecting the building to the existing geothermal district network and second, installing the PCM storage tank and all electrical and mechanical components for energy transmission and measurement.

INCLINED LIFT ENERGY EFFICIENCY PILOT PROJECT IN CUNEO, ITALY

The inclined lift in Cuneo is a form of local transport widely used by the population of the city, as it connects the large parking area of Piazzale Cavallera with the historic and commercial centre of the city.

The project included the realization of a new system for the production and storage of electrical power, integrated with the drive of the inclined elevator, as well as the construction of a small photovoltaic field along the system runway to supplement the amount of electrical energy that is produced by the elevator during some operating phases.

This is actually a single integrated system, made up of several distinct elements, which also requires some construction works for support. The project is aimed at optimising the energy resources necessary for the operation of the lift by means of the storage system, in which electricity is stored and from which it will be used when needed.

THE AUTARKY RATE TOOL

The Autarky Rate Tool is a simple but very useful online tool which is available for everyone who is interested in the installation of electrical storage solutions in combination with renewable energy sources.

By adding only a few numbers, the user will get an evaluation of the technical, economical and ecological effects of the chosen system configuration.

The main output is of course the autarky rate, which is a figure for the independency from the public grid. If the autarky rate is high, this means that the user is able to self-supply major parts of his energy demand.

You can check out and try all of our tools on the project's website:
https://store4huc-autarky.4wardenergy.at/

ENERGY MANAGEMENT SYSTEMS

The Optimal Sizing Calculator
The Optimal sizing calculator maximises the benefits of Photovoltaic systems, while minimising the cost of installation and maintenance.
The tool calculates optimal sizes of the investment in a PV system (its peak power) and a BESS (battery capacity and power converter nominal power) for a particular consumer. It takes into account peak power pricing, feed-in energy pricing, energy efficiencies of the power converter, degradation of the batteries and maintenance costs, which in turn gives credible results. The results are obtained for a specific investment payoff period specified by the user.

The Optimal Heat Source Scheduler
Thermal energy storages introduce flexibility into heating systems with numerous advantages on system performance and operational and maintenance costs. One of the most prominent advantages is the ability to use heat sources at their maximal efficiency.
To use the full potential of a thermal energy storage, an adequate control algorithm is required to control the heat sources connected to it. The Optimal heat source scheduler uses power demand predictions, along with parameters of the heating system, to output an optimal schedule of the heat source(s).

WHO WE ARE

Partners from five central European countries joined their forces to improve environmental management in urban areas.

Austria

- Energy and Innovation Centre of Weiz
- 4ward Energy Research Ldt.
- CES clean energy solution GmbH

Croatia

- North-West Croatia Regional Energy Agency
- University of Zagreb, Faculty of Electrical Engineering and Computing

Germany

- Climate Alliance

Italy

- Environment Park
- City of Cuneo

Slovenia

- Development agency Sinergija
- Municipality of Lendava

Partners across five countries developed policy recommendations and identified suitable integrated technological solutions to overcome low carbon development barriers in historic centres.

They also facilitated the development of open energy and load management systems for energy efficiency and use of renewables. With its concepts and pilot systems, STORE4HUC provides smart city test beds, where technicalities can be reconciled with historical and architectural values.

Who funds us

Our project is funded by the Interreg CENTRAL EUROPE Programme that encourages cooperation on shared challenges in central Europe.

Around 1.42 million Euro of funding from the European Regional Development Fund, the programme supports institutions to work together beyond borders to improve cities and regions in Austria, Croatia, Germany, Italy and Slovenia.

DISCOVER MORE ABOUT

STORE4HUC

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