

TAKING
COOPERATION
FORWARD



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**Integration and smart management of energy storages at
historical urban centers**



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THE CONTENT

Project Partners

Some Facts
about
STORE4HUC

Pilot in AT

Pilot in IT

Pilot in SI

Pilot in HR

Preliminary
recommendations



SOME FACTS OF STORE4HUC

Store4HUC: Integration and smart management of energy storages in historical urban centres (HUC)

Project start: April 2019,
duration 36 months

Involved cities: Weiz/Austria,
Cuneo/Italy, Lendava/Slovenia,
Bračak/Croatia

Technologies: Electrical and
thermal storages in HUC



IMPLEMENTATION STORAGE TANK - DISTRICT HEATING WEIZBERG

The local heating network and the heating plant of the cooperative "Biomass Heating Plant Weizberg" was built in 1999.

It is a two-boiler system fired by hay at the Weizberg church site. The system is operated without storage and back-up yet.



IMPLEMENTATION STORAGE TANK DISTRICT HEATING WEIZ

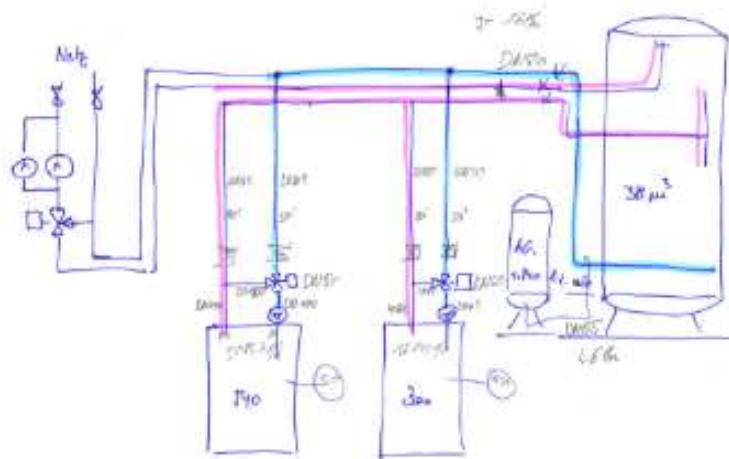
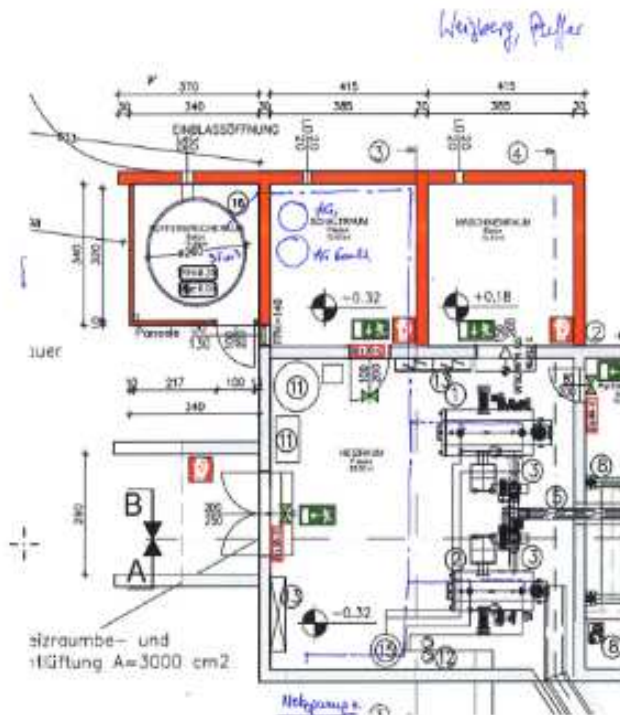
A Storage Tank with 38m³ are going to be implemented at beginning of 2020

Heat exchanger

Monitoringsystem: Company Schneid

Expected Savings: 9% of biomass fuel, 2 % grid losses, 12 % electricity

Use of Store4HUC energy management tool for operation planning and evaluation



STAKEHOLDER ENGAGEMENT

Involvement of stakeholders via invitations at local level

Establishment of Deployment Desks

Interviews of stakeholders according to elaborated inquiries

Continuous updates of the stakeholder discussions towards effective capacity building and engagement



SLOPING ELEVATOR IN CUNEO

Location description



Summary of mobility in Cuneo



- 12 free areas parking,
- Limited traffic zone
- 30 km/h Speed restriction zones



- 11 public transport lines
- Free shuttle service
- Flexible local public transport services
- **1 sloping elevator**



- Bike-sharing service – 300 bicycles (from July 2019)
- Parkings for 3000 bikes
- 37 km cycle path (20 km in the city centre, 18 km in the surrounding park)
- 105 km of cycle path in the surrounding villages



- 7 pedestrian areas



Background and content of the pilot project

The purpose of the project is to carry out a pilot project that allows the use of renewable energy for the operation of the elevator system, limiting the energy consumption to a minimum.

Through a precise analysis of consumption, the strategy for the realization of the pilot project will be defined, which will see the combination of a photovoltaic system with direct exchange to a part combined with a storage system. **The analysis will include optimal PV and storage sizing.**



SELECTED PILOT LOCATION

Selected Public Building - Lendava Library

Location: Oskar Laubhaimer's neo-baroque villa built in 1906

Address: Glavna ulica 12, Lendava

Heated area: 300 m²

Heat source: Heating Oil



There are several advantages of latent paraffin-based storages against the “usual” thermal heat storages:

- **Require less space** - smaller dimensions
- **Less temperature loss** - more efficient
- **Less reactivity** with the environment and **less likelihood of leakage** as it changes phases
- **Better heat transfer performances=higher efficiency=lower heating costs**

The pilot is an innovative investment at the national level, such installation has not yet been built anywhere in the SI.

- **Example of innovative solution of storing renewable energy in an effective way - paraffin solution itself**
- **The connection between geothermal energy and paraffin based latent storages**

Paraffin wax is an excellent material for storing heat



Paraffin cells are innovative buffer storages that have been developed to efficiently store heat and cold generated from small irregular energy sources such as solar energy, heat pumps etc.



PILOT OBJECTIVES/SAVINGS

1. Reduction of energy consumption/share of fossil fuels: 60 MWh (current consumption of heating oil).
2. Reduction of CO₂ Emissions: 16,8 tons.
3. Exploitation of renewable energy - geothermal energy: 57 MWh (savings related to energy storing included).
4. Increase of energy efficiency: 5,5% or 3 MWh.
5. Implementation and presentation of an innovative way of energy storing.
6. Use off-line operation planning and evaluation tool for providing recipes how to perform daily setup for system operation in order to maximize benefits.



THE MANOR BRAČAK

Location: City of Zabok
Bračak 4, 49210 Bračak
Krapina-zagorje County
Continental Croatia



- In 2017. reconstructed and restored in accordance with best practices in renewing heritage on the principle of energy efficiency.



BACKGROUND OF THE PILOT

Cultural heritage Building with new technologies:

- Built in 1889.
- Restored to the highest standards of energy efficiency.
- Used as central place for organizations, companies and institutions interested in renewable energy.
- It also serves as business incubator for young companies with a favorable lease of business office space.



BACKGROUND OF THE PILOT

Building insulation

- Internal wall insulation
- Energy efficient windows and doors

HVAC system

- Wood pellets boiler
- Micro CHP - Combined Heat and Power
- Air-water heat pump
- Heat recovery ventilation system

- Efficient lighting system



- Determine the optimal sizing parameters for a PV + battery storage combination on the base of existing site consumption patterns
 - using the off-line energy management tool for planning, parameterization and evaluation of energy refurbishment measures at historical urban sites, developed within Store4HUC
- Upgrade the current energy management system such that it enables optimal interaction of PV+baterry with the microCHP+pellet boiler heat/electricity sources in serving building heat and electricity needs
 - using the on-line energy management tool for smart operation of a historical urban site
 - actuation points subject to optimization: battery system, micro CHP, pellet boiler



PROJECT PARTNERS



RAZVOJNA AGENCIJA
SINERGIJA
DEVELOPMENT AGENCY



Der Standort für Forschung, Bildung & Wirtschaft



Città di Cuneo



**ENVIRONMENT
PARK** Parco Scientifico
Tecnologico per l'Ambiente



Climate Alliance



REGIONALNA ENERGETSKA AGENCIJA
NORTH-WEST CROATIA
SJEVEROZAPADNE HRVATSKE
REGIONAL ENERGY AGENCY



PRELIMINARY RECOMMENDATIONS

Dedicated structures need to be developed to answer to the needs of involved cities.

Long lead times might occur during tender procedures.

Fragmented decision-making processes such as bureaucracy at the municipality level might also create delays., e.g. the need to involve separate departments in the authorisation process, together with the budget planning.

High visibility leading to replication of even private investors.

New agendas due to major political changes.

