

4111_Innovative technical solutions within EU-GUGLE and Store4HUC, pilot projects for historical centres

Michael Heidenreich¹, Rosa Hemmers² and Andrea Dornhofer³

EU-GUGLE (<http://eu-gugle.eu/>): During the project duration of this Smart City project from April 2013 to March 2019, 36 pilot buildings/building groups located in six European demonstration cities have been renovated by implementing a wide variety of energy efficiency measures and renewable energies, with a total investment of around 80M€. The energy savings achieved with the implementation of these measures vary in the different EU-GUGLE pilots depending on the local climatic conditions, type of technology, previous energy consumption as well as on being a listed building.

Store4HUC (www.interreg-central.eu/Store4HUC): It is challenging to provide a low carbon energy supply in cities in a style of energy storages. Especially in historical urban centres it is very difficult to achieve these results, because interventions in this specific area meet strict architectural protection constraints, involve higher implementation costs and often come in conflict with town planning policies. Therefore, the main objective of this recently started project is to improve and enrich energy and spatial planning strategies targeting historical city centres by focusing on integration of energy storage systems to enhance the public institutional and utility capabilities. Examples of both projects will be presented to underline the integration of renewables for mutual smart services in the urban and in particular historical context.

In **Aachen**: Due to developments during the last 80 years, many residential buildings are listed buildings. As a result, the district master plan focuses on revitalizing and improving the attractiveness of the district. Aachen North has a total area of 3 km² with a population of 15,500 inhabitants. It is part of a multi-year urban development program called the Aachen North Social City wherein the efficiency of building envelopes are thermally upgraded, building plant systems are renewed and the energy infrastructure is being revitalized. Approximately 1,500 of the district residents, representing 10% of the Aachen North population, are directly involved in the EU-GUGLE project. The pilot buildings are owned by the City of Aachen (75%) and by GEWOGE, a public housing company (25%).

In **Weiz**: The parish on the Weizberg consists of Basilica Church built in the 11th Century and is a listed building facing monumental protection limitations. The heating plant and related local network of the cooperative "Biomass Heating Plant Weizberg" was built in 1999. The network is supplied by a two-boiler system fired with hay at the

¹ CES clean energy solutions GesmbH, Schönbrunner Str. 297, 1120 Vienna, m.heidenreich@ic-ces.at

² SynergieKomm Agency for Sustainability and Innovation, Turmstr. 17, 53175 Bonn, info@synergiekomm.de.

³ Weizer Energie- Innovations- Zentrum GmbH, Franz-Pichler-Straße 30, 8160 Weiz andrea.dornhofer@innovationszentrum-weiz.at

Weizberg church site. The system is operated without back-up, meaning there is no additional energy storage. A paraffin cell buffer-based energy storage system will be implemented while in Weiz, the biomass heating plant of the parish will be supplemented with a hot water storage tank. The site is part of the energy vision of Weiz (SECAP of the city of Weiz) to save about 40% of CO₂ emissions per capita from 1990 – 2030 (Bramreiter et al. 2019).

A survey performed in the two cities shows that the majority of the participants are well aware of the harmfulness of the climate change and are aware about energy efficiency and related sustainable actions. The dominance of being convinced on it is depending on the education and knowledge level. Energy performance certificates are voted as relevant and shared with positive attributes in regards to energy efficiency measures similar to the integration of renewable energy with a declared willingness to pay more. The majority would be proud to live in a low-consumption home, neighborhood and city. The success of the project is due to the exchange of knowledge and integrated efforts of engaged members of the two pilots together with parallel efforts in related projects moving towards the same goals.

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