

IEA SHC TASK 55

Towards the Integration of Large SHC Systems into DHC

Trends in April 2018

1. SHC and DHC intensive cooperation

The Solar heating and cooling (SHC) program and the district heating and cooling (DHC) program had their first Expert Workshop next to the Solar District Heating Conference in Graz, April 2018. The focus of the workshop with about 50 participants from SHC Task 55 and Annex TS2 was on financial and infrastructural challenges to integrate district heating and solar thermal energy systems. On the one hand, public financing is still an issue. On the other hand, the value of “green” must be captured in new SDH installations. Investors for SDH installations must be informed about latest technology developments. Barriers of SDH installations are still temperature requirements of DH, area needed, or storage requirements.

2. Tests on installed storages in SDH are limited, but modelling is popular

Storages of SDH systems require considerable land area. Therefore, simulations prevail and actual installations are limited. Long term storages of larger size haven't been realized in urban DH networks yet. Suitable areas are limited and costly in cities. On the other hand, areas outside of populated areas require transportation with pipes, also inducing higher costs. Investors also speculate on land prices as soon as their strategic importance for energy storage become public. Further research and public commitment is needed to facilitate the realization of storages for SDH.

3. Modelling and Simulations on SDH are Trend in Task 55

The complexity of cross-sectoral energy systems and DH networks calls for the support by computers and algorithms. Several simulations are now available to investigate system and network performance of SDH. The formulation of challenges as a mathematical optimization problem delivers automatic solutions even for complicated configurations not tested under real life operation. The modular design in computer systems allows for an easy experimentation with different configurations. Additionally, the systems adapt to newly installed technologies. Central are well developed interfaces to process the system visualizations and simulations. Free software products will be available in 2019 in Task 55.

4. Relevance of heat pumps increases for SDH

An increasing number of feasibility studies for large district heating networks of cities has been developed within recent years. Heat pumps have become a popular option to achieve higher share of renewable energies and thus reduce/replace the use of fossil fuels in DH networks. Still, the mismatch between electricity demand and availability of renewable energy is a challenge. Integration of a heat pump in a SDH installation can have environmental benefits, but careful planning is required and time of electricity use has to be considered. Otherwise, the integration of heat pumps could be overrated. It has also to be considered, that a significant reduction of the energy demand of the building stock is a prerequisite for a truly sustainable energy system.

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Research Project Task 55: Solar thermal and district heating scale up together

Back to the roots: For the 2nd time, the internationally successful research project IEA SHC Task 55 took place in Graz. From April 9 to 10 2018, 41 globally recognized experts from 11 countries discussed new pathways and successful solar thermal projects in district heating at the Hotel Weitzer.

At the meeting, brand new and well-kept research results were presented. In order to design systems that are technically sophisticated and to ensure cost-effectiveness, the latest forms of quality assurance and the latest test methods for components of solar thermal systems were presented. It is unique that very specific plant data are evaluated and presented, although there are a number of industry competitors among participants. Even China is represented by a large company. The pursuit of competitive solar thermal systems is clearly visible and unites even the toughest competitors in the project.

It has been shown that numerous companies in the solar industry are interested in district heating and cooling. The next Task 55 meeting will take place in the fall of 2018 in Spain or China with new results and insights into Chinese solar thermal systems. Registration soon!

Homepage: <http://task55.iea-shc.org/>