Building Experts at EuroSun 2018 Discuss What's Being Done and What Needs To Be Done

The 12th EuroSun International Conference on Solar Energy for Buildings and Industry was a big success. On September 10th to 13th, more than 130 oral and 180 poster presentations were given to an audience of researchers, professionals, and experts from all over the world in Rapperswil, Switzerland.

Key messages from the building experts' presentations highlighted how:

- The transition to a carbon-emissions-free society will move through buildings that are more electrified than today – future buildings will no longer act as consumers, but become prosumers thus minimizing the dependency on energy grids.
- Deeper integration of thermal and electric infrastructures are necessary.

Building envelopes represent a natural exploitable surface to "interact with" and to take advantage of the outdoor environment. Building Integrated (BI) Solar Envelope Systems, as demonstrated in IEA SHC Task 56: Building Integrated Solar Envelope Systems for HVAC and Lighting, reduce heating and cooling demands of buildings while controlling daylight and delivering renewable thermal or electric energy, or both to the systems providing heating, cooling, and ventilation to buildings.

At EuroSun 2018, many new technology developments were presented, but Photovoltaic Thermal (PVT) solar collectors took the spotlight. Despite the remarkable efforts over the past years, few commercial PVT products have succeeded in the market. Reasons for this gap between effort and success is a common stumbling block for solar thermal technologies – the complexity of the design and installation processes, lack of knowledge of stakeholders, aesthetic limitations and building regulation constraints, and lack of test procedures, to name the main ones. The good news is that change is happening and what's driving this change are a more favorable market and legislative conditions thanks to the definition of NZEB standards and building codes prescribing a minimum share of renewable energy production. Recent PVT solutions promote more compact and modular installations, the enhancement of thermal and electrical efficiencies by using low-e coatings and vacuum solutions, all combined with new aesthetically appealing solutions guaranteeing a better integration in the building envelope and visual acceptance.

New BI solar thermal developments that integrate thermal storage and collectors into façade solutions for domestic hot water preparation in residential applications were also presented at the conference.

AventaSolar's integrated solar thermal system on residential buildings.

From the four days of discussions, what emerged was that system integration is the ultimate factor for enhancing the competitiveness of solar technologies compared to conventional fossil fuel-based systems. Thanks to the type of actions noted above, PVT collector manufacturers are carving out a larger share of the market, but more work is needed on demonstrating the benefits of PVT applications. On-site energy production from BI solar thermal collectors has demonstrated its technical effectiveness through the years. Moreover, a large variety of system layouts have been developed and demonstrated, but the complexity of the hydraulic integration and high upfront costs have restrained market upscaling.

Building integration of solar technologies is one the most promising paths towards increasing energy efficiency and renewable energy sources in the construction sector. Despite this fact, it is hardly recognized as an added value by the market. The success of a technology on the market cannot be determined solely based on its optimum technical performance. Factors such as aesthetics, regulations, easy of design, installation and maintenance, economic sustainability, and co-benefits like better comfort and flexibility of building energy management must be accounted for and quantified.

To learn how SHC Task 56 is tackling these "other factors" visit our website at http://task56.iea-shc.org/.

This article was contributed by the Italian Task expert, Matteo D'Antoni of EURAC Research's Institute for Renewable Energy.