

### IEA SHC & ISES Recognize Outstanding Solar Building Concepts

IEA SHC and ISES (International Solar Energy Society) teamed up to present an Out-of-Contest Award during the Solar Decathlon Europe this June in Wuppertal, Germany. The driver behind this collaboration was to shine a light on the team that successfully integrated solar thermal concepts in their building.

Solar Decathlon Europe is the world's largest construction competition for universities, with 18 teams from 10 countries participating this year. To the surprise of the IEA SHC/ISES jury, not one team but two teams stood out, and both received the Solar Award. The first team was VIRTUe from the Eindhoven University of Technology in the Netherlands and the second team was LOCAL+ from the Aachen University of Applied Sciences in Germany.

The Solar Award recognizes the Solar Decathlon teams with the most convincing and transferable technical integration and significant CO<sub>2</sub> reduction achieved by onsite solar energy use covering the building's space heating and hot water demand.

The Solar Award jury of ISES President Prof. Klaus Vajen from the University of Kassel, Germany, Kerstin Krüger, Vice-Chair of the IEA SHC Programme and German Executive Committee member, and Prof. Andreas Häberle, head of the SPF Institute for Solar Technology in Rapperswil, Switzerland and leader of IEA SHC Task 64 visited all 16 full-scale (1:1) flagship buildings for sustainable urban living. "What we saw during our tour was that many teams used colored PV and PVT elements in the façade or on the roof combined with heat pumps. But some teams developed special solutions for distributing heat in the building, increasing the solar share, and meeting heating demand in winter," noted Häberle.

"We were impressed by the well-thought-out technology concepts and the team spirit we saw. In both teams, we were welcomed by professional guides showing us around their projects,"

ANDREAS HÄBERLE  
IEA SHC

### Team VIRTUe of the Eindhoven University of Technology



VIRTU/e

The jury lauded the overall energy concept of the winning team VIRTUe, which followed three objectives:

- Reducing energy demand with a highly insulated and air-tight building envelope and a heat-recovery ventilation & showering system.
- Decarbonizing the energy supply using onsite solar electricity and heat production combined with a brine heat pump.



◀ The wood-based building of the VIRTUe team from the Netherlands can be used to add additional floor space to existing buildings. The roof is walkable and includes a PVT field plus a solar collector linked to the house's underfloor heating and cooling system.

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- Matching demand and supply with the help of thermal and electric storage and managed by a smart home and energy management system.

A unique feature of the VIRTUe building was the distribution of heat and cold via the floor, where phase-change material elements were integrated to achieve a higher thermal mass. Other aspects the SHC/ISES jury noticed were that the team included only students, even for the project management, and they brought their own power container with PV modules and 120 kWh battery for the two-week construction period so that they would not need a power connection on site.



▲ Team VIRTUe of the Eindhoven University of Technology in the Netherlands.

## Team LOCAL+ from the Aachen University of Applied Sciences

The LOCAL+ team from Aachen also convinced the jury with its overall energy supply concept – a PVT field on the roof to provide heat and electricity for a brine heat pump. The unique features were ice storage that could be regenerated by thermal energy from the PVT elements and heat and cooling distribution using ceiling elements made from clay, a 100% recyclable material. The jury was also impressed by the team spirit of LOCAL+ as they banded together to finish their house after suffering severe storm damage during the construction period.

To learn more about Solar Decathlon Europe 21/22, visit <https://sde21.eu/>.



▲ Team LOCAL+ from the Aachen University of Applied Sciences with the SHC/ISES jury.

◀ The energy concept of the LOCAL+ team from the University of Applied Sciences in Aachen, Germany, uses façade-integrated PV elements (blue on the photo). These are color-coordinated with the other building materials to increase the acceptance of onsite energy production.