

Sustainable Urban Energy Solutions: from Buildings to Neighbourhoods

Chair

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Abstract

From 2021 on all new buildings need to be nearly zero energy. In addition, the energy supply of existing buildings needs to become sustainable; by 2050 the built environment needs to be fully supplied with renewable energy. Many solutions exist on building scale, but most of these are based on 'net zero energy', meaning the annual energy use of a building is equal to the annual energy generated on the building (or nearby). Not all building solutions have a positive effect on the larger energy system, nor make optimal use of potential of collective solutions and the local potentials. This session covers the topic of sustainable energy supply for buildings in neighbourhoods, where local potentials are used to balance the energy demand and supply in the area, and where an optimum is sought between building- and neighbourhood energy measures. In case of existing buildings this means for example that not all buildings need to be 'zero energy' buildings, but sometimes neighbourhood energy supply can be more feasible or (cost) effective.

The session also presents the recently finished 'Smart Urban Isle' (SUI) project. This European research project focussed on developing energy systems that locally balance the energy demand and supply as much as possible, by locally generating, distributing and storing the neighbourhood energy demand. This is supported by making use of the synergies between different (building) functions and of the scale advantages for energy solutions. Different SUI concepts were developed for areas consisting of 10 – 1000 buildings.

Summarizing, the research items of this session will include:

- Sustainable energy for urban neighbourhoods
- Optimum between building measures and neighbourhood energy measures
- Synergy between different building functions and energy exchange
- Scale advantages of collective energy solutions & optimum scale of application
- Innovative energy solutions
- Local micro heat grids, at different temperature levels
- Implementation plans & cooperation with local municipalities, residents and stakeholders

Presentation 1

Introduction to the Smart Urban Isle Project & outline of the Development of the 'SUI' concept for Haarlem

Author: Dr.ir. Jansen S (Sabine)

Presentation 2

Retrofitting solutions and how this is related to energy demand and required temperature level of the heat supply

Author: Dr. Bokel R (Regina) r.m.j.bokel@tudelft.nl

Presentation 3

Development of the neighbourhood energy concept for two examples: Haarlem (NL) and Limassol Campus (CY)

Author: Dr. ir. Mohammadi S (Saleh).

Presentation 4

Ramplaankwartier: User participation and cooperation with stakeholders

Author: Drs. Eelco Fortuijn (project leader of the SpaarGas project in Haarlem)