

Solar façades

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Solar façades – Main barriers for widespread façade integration of solar technologies*

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Abstract

Solar energy has been actively promoted as a clean energy source since 1973's oil crisis, evidenced by the emergence of initiatives such as the Solar Heating & Cooling Programme of the International Energy Agency or the US Department of Energy. Nonetheless, solar technologies have not been widely used in the built environment, limiting their operation to industrial and macroscale applications. Commercially available products such as building integrated PV panels (BIPV) or building integrated solar thermal collectors (BIST); and novel prototypes and concepts for solar cooling integrated facades are seen as interesting alternatives for the development of new performance based façade components for high-performing commercial buildings. However, there are barriers to overcome in order to promote widespread application of architecturally integrated solar components.

The present paper seeks to discuss perceived barriers for widespread façade integration of solar technologies, in order to define the current scenario and generate guidelines for future developments. In order to achieve this, the paper presents the results of a survey addressed to professionals with practical experience in the development of façade systems for office buildings, situated at any stage of the design and construction process. Hence, architects, façade consultants, system suppliers and façade builders were considered. The outcome of this study is the definition of the main perceived barriers for façade integration of solar technologies, discussing the results from the survey along with other related experiences found in the literature.

This study is part of the ongoing PhD research project titled COOLFAÇADE: Architectural integration of solar cooling strategies into the curtain-wall, developed within the Façade Research Group (FRG) in the Green Building Innovation programme (GBI) of the Faculty of Architecture and the Built Environment, TU Delft.

Keywords

Solar technologies, PV, Solar thermal collectors, Solar cooling, Façade integration, Survey

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JANUARY 19TH 2017 – MUNICH
POWERSKIN CONFERENCE

The Building Skin has evolved enormously over the past decades. Energy performance and environmental quality of buildings are significantly determined by the building envelope. The façade has experienced a change in its role as an adaptive climate control system that leverages the synergies between form, material, mechanical and energy systems in an integrated design.

The PowerSkin Conference aims to address the role of building skins to accomplish a carbon neutral building stock. Topics such as building operation, embodied energy, energy generation and storage in context of façades, structure and environment are considered.

Three main themes will be showcased in presentations of recent scientific research and developments as well as projects related to building skins from the perspectives of material, technology and design:

Environment – Façades or elements of façades which aim for the provision of highly comfortable surroundings where environmental control strategies as well as energy generation and/or storage are integral part of an active skin.

Façade Design – The building envelope as an interface for the interaction between indoor and outdoor environment. This topic is focused on function and energy performance, technical development and material properties.

Façade Engineering – New concepts, accomplished projects, and visions for the interaction between building structure, envelope and energy technologies.

TU München, Prof. Dipl.-Ing. Thomas Auer, **TU Darmstadt**, Prof. Dr. Ing. Jens Schneider and **TU Delft**, Prof. Dr.-Ing. Ulrich Knaack are organizing the PowerSkin Conference in collaboration with BAU 2017. It is the first event of a biennial series. On January 19th, 2017 architects, engineers and scientists present their latest developments and research projects for public discussion.

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