

2017 HIGHLIGHTS

Task 51 – Solar Energy in Urban Planning

THE ISSUE

A large portion of the potential for energy efficiency in existing buildings and the potential to utilize solar energy still remains untapped. The built environment accounts for over 40% of the world's total primary energy use and 24% of greenhouse gas emissions. The combination of making buildings (refurbishing and new developments) more energy efficient and using a larger fraction of renewable energy is therefore a key issue. Political statements and directives are already moving towards zero-energy buildings, communities and whole cities. An increased use of solar energy is one important part of the development ahead, where the urban fabric needs to utilize passive solar gains and daylight to reduce the energy use in buildings and for lighting outdoor environments, as well as to improve the inhabitants' comfort indoors and in urban outdoor areas. And, active solar energy systems integrated in the urban context enable a supply of renewable energy primarily as heat and electricity, but also of solar cooling, helping cities reach sustainable solutions.

OUR WORK

The main objective of SHC Task 51 is to provide support to urban planners, authorities and architects to achieve urban areas, and eventually whole cities, with architecturally integrated solar energy solutions (active and passive) that contribute a large fraction of the renewable energy supply in cities. Results include processes, methods and tools to assist cities with developing a long-term urban energy strategy. Heritage and aesthetic issues and solar fields in sensitive landscapes have also been studied. Additionally, a goal is to prepare for and strengthen solar energy in urban planning education at universities. The material developed will also be useful for post-graduate courses and continuing professional development (CPD).



Task experts at final meeting in Sydney, Australia

Participating Countries

Australia

Austria

Canada

China

Germany

Denmark

France

Italy

*Luxembourg
(observer)*

Norway

Sweden

Switzerland

Task Period

2013 - 2017

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KEY RESULTS IN 2017

State-Of-The-Art in Education and New Tool Development

A report on the state-of-the-art in education regarding urban planning with solar energy was published in 2017. The main conclusion from this work is that there are many courses dealing with solar energy, but most of these courses are in engineering and architecture programs and focus on the technical aspects of solar energy, such as materials, system components and the construction of solar systems. In urban design and urban planning programs there are only few courses dealing with this topic. Thus, a huge gap is detected in urban planning education. A complementary report was also finalized that covers solar irradiation potential tools in education. This second report will be published early 2018.

An independent tool for urban-based solar irradiation potential analyses has been specially developed for use in education and training. This will be available free of charge. The user interface can be activated and used in both German and English. The tool and the user manual were approved in December 2017 and will be published in early 2018. In addition, the work on summer schools resulted in the report “Summer Schools on Solar Energy in Urban Planning - Teaching Methodologies and Results”, was published in 2017 in English and German.

Case Studies, Comparisons and Lessons Learnt

The extensive work on case studies and action research have resulted in more than reported cases, which are presented in the report “Illustrative Prospective of Solar Energy in Urban Planning: Collection of International Case Studies”. These cases represent new urban areas, existing urban areas and landscapes. They include solar thermal, photovoltaics and passive solar strategies. The report was published in 2017 and can be found on the SHC Task 51 website. This work provides examples of real applications from across the world and is intended to inspire actors involved in urban planning. A second report based on the case studies was also finalized, “National and International Comparison of Case Studies on Solar Energy in Urban Planning” and approved in December 2017. Each comparison provides lessons learnt and recommendations for the different target groups, such as urban planners, architects, researchers and urban stakeholders involved in the planning process. This report will be published early 2018. A third report is “Lesson Learnt from Case Studies of Solar Energy in Urban Planning”. This report presents lessons learnt primarily through cross country comparisons concerning ten categories 1) Legislation, 2) Solar rights and solar potential, 3) Daylighting, 4) Planning process, 5) Approaches, methods and tools, 6) Education, 7) Stakeholders’ and researchers’ involvement, 8) Energy use, 9) Economy, and 10) Architectural visibility, sensitivity and quality. This report will be published in early 2018.

Approaches, Methods and Tools



The report “Approaches, Methods and Tools for Solar Energy in Urban Planning” is in its final stage and will be published in 2018. This report gives a theoretical background to the complex decision making context in urban planning, presents ways on how to inform and support decision making in urban planning regarding solar, and gives examples of how new and developed approaches, methods and tools fit into this context.

The last of the results from Task 51 will be available in 2018 on the SHC website.