

## 2015 HIGHLIGHTS

### SHC 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 to 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 will 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 will also be 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).

#### Participating Countries

Australia  
Austria  
Canada  
China (observer)  
Germany  
Denmark  
France  
Italy  
Luxembourg (observer)  
Norway  
Sweden  
Switzerland

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## KEY RESULTS OF 2015

A report on the state-of-the-art in education regarding urban planning with solar energy will be published in 2016. 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 review of existing urban planning legislation and voluntary initiatives and of existing urban planning processes in participating countries will be published in 2016. Preliminary findings show that despite the fact that over 30 years ago it was recognized that a satisfactory legal regime for solar access protection needed to be established, the analysis from national perspectives shows that the law on this issue is still unsatisfactory. There is considerable scope for legal reform in many countries. The studies on urban planning processes showed that solar energy was not considered systematically. For example, in Italy it is common practice for urban planners and architects to design for daylight access while in Sweden much of the basic knowledge around planning for daylight access has been forgotten. When solar energy is considered it is through locally set targets and goals usually aimed at specific planning projects. The targets and goals are usually specified for buildings and not an area as a whole. Often this means that solar energy is left to the building design and not considered in urban design phases where for example building heights and street widths are decided. In some cases, local public bodies can set their own requirements for buildings, which in effect creates locally decided building codes. In other cases, the local public bodies can only set specific requirements if they own or procure the land. This possibility was also available in Sweden until 2015 before a law passed that effectively hinders municipalities from deciding on tougher requirements than what is stated in the national building code. Furthermore, urban planners are generalists who have to consider many different aspects. It is therefore important that methods, tools and approaches are designed to aid urban planners in their work rather than increasing their workload. A large amount of software tools exist today where solar insolation of an urban area can be calculated and visualized but there is a lack of approaches and methods of how to integrate the results from such tools into traditional urban planning processes.

The work on case studies and action research have so far resulted in 34 reported cases. These are representing new urban areas (18), existing urban areas (11) and landscapes (5). They include both solar thermal and PV. The case studies will be finalized in 2016 and then published.



**Task experts visiting a solar farm in Reunion Island, France, in conjunction with the September Task meeting.**