

2020 HIGHLIGHTS

Task 63 – Solar Neighborhood Planning

THE ISSUE

A large portion of the potential for energy efficiency in existing buildings and the potential to utilize solar energy still remains unused. A combination of making buildings more energy-efficient – through refurbishment interventions and new developments – and increasing the use of renewable energy sources is a key issue to reduce fossil energy use and greenhouse gas emissions, towards a low carbon energy transition. The increased use of solar energy is one of the important development paths, where the urban fabric needs to utilize passive solar gains and daylight to reduce the energy use in buildings, as well as to improve the inhabitants' comfort in indoor and outdoor areas. In addition, active solar energy systems integrated in the urban context contribute to the production of renewable energy as heat and electricity. All these strategies help cities and citizens in reaching sustainable developments.

OUR WORK

The main objective is to support key players to achieve solar neighborhoods that facilitate long-term solar access for energy production and for daylighting buildings and outdoor environments – resulting in sustainable and healthy environments. Key players include developers, property owners/associations, architects, urban planners, municipalities and institutions. The scope of the Task includes solar energy issues related to new neighborhood development and existing neighborhood renovation and development.

Solar energy aspects include active solar systems (solar thermal and photovoltaics) and passive solar strategies. Passive solar strategies include passive solar heating and cooling, daylighting, and thermal/visual comfort in indoor and outdoor environments.

The types of support being developed include strategies for the design of new and existing communities with focus on solar energy, methods to secure sunlight access and right to light. Furthermore, the Task is working on economic strategies and business models for better use of passive and active solar energy. Apart from economic values, added values or co-benefits of solar energy are considered. Another objective is to study the workflow of tools needed to support decisions in all planning stages (tool chain). Finally, case studies in each participating country is a central part to bind close ties to practice and implementation.

Participating Countries

Canada

China

Denmark

France

Norway

Italy

Sweden

Switzerland

To Be Confirmed

Australia

Germany

EACREEE

Task Period

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KEY RESULTS IN 2020

Neighborhood Archetypes in Development

A matrix developed within Subtask A characterizes different archetypes of neighborhoods. Task experts are using this matrix to collect information about typical neighborhoods in different countries to use in simulations and analyses of solar planning strategies and concepts for neighborhoods. These examples can range from simple residential neighborhoods to more complex neighborhoods composed of various types of buildings. Task experts have collected 24 examples from 7 countries (Denmark, France, Switzerland, Italy, Norway, Sweden and Canada). And key data for archetypes together with simulations and analyses include solar access, solar potential, daylighting and outdoor microclimate conditions.

Urban Surface Uses

Several activities are ongoing in Subtask B to support the planned publication on surface uses in neighborhoods. Based on six identified surface uses, potential conflicts and synergies of urban surface uses have been identified, and co-benefits highlighted. Barriers and drivers (technological, economic, social and other) to implementing integrated or multifunctional solutions were further described.



Six different ways to use an urban surface to provide sustainability across cities. (Source: Silvia Croce, Eurac Research)

Workflow Stories

Workflow stories describe the use of tools for solar neighborhood planning. The structure of these stories include:

- Introduction
- Performance Indicators (related to solar aspects)
- Method (geometry, input data for analyses)
- Results (analyses of different KPIs)
- Workflow
- Lessons Learned.

These stories will be included in the first Subtask C report on the identification of existing tools and workflows.

Case Studies

Case Studies of planning of solar neighborhoods are ongoing in participating countries within Subtask D. These studies will serve as a platform for exchanging experiences from practice. This work includes testing developed strategies and tools in practice and interviewing stakeholders across Subtask A, B and C topics.