



**SOLAR HEATING & COOLING PROGRAMME**  
INTERNATIONAL ENERGY AGENCY

# **Solar Energy in Urban Planning overview of Task 51**

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Webinar, 13<sup>th</sup> September, 2017

# Solar energy is an important renewable energy source

## Towards zero-energy buildings and communities

1. Reduce the energy demand
2. Increase the use of renewable energy!



# Towards zero-energy balance

- This will increase the use of the building envelope as an active solar collector! - highly influencing the building's architecture and the urban landscape
- Large solar fields will influence the landscape in the countryside
- We need to plan and design in a good way



# Task 51: Solar Energy in Urban Planning

Duration: 2013 – 2017

## Main objectives

- Provide support to urban planners, authorities and architects to achieve urban areas with architecturally integrated solar energy solutions, highly contributing to cities with a large fraction of renewable energy supply.
- Develop approaches, methods and tools capable of assisting cities in developing a long term urban energy strategy. Heritage and aesthetic issues are taken into account.
- Prepare for and strengthen education at universities on solar energy in urban planning, by testing and developing teaching material. The material will also be useful for post graduate courses and continuing professional development (CPD).

# Participating countries

- Australia
- Austria
- Canada
- China
- Denmark
- France
- Germany
- Italy
- Luxembourg
- Norway
- Sweden
- Switzerland



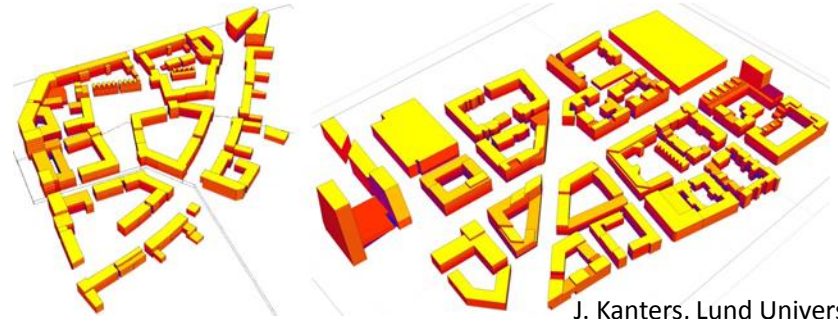


# Applications

Solar thermal, photovoltaics, passive solar

## New urban areas

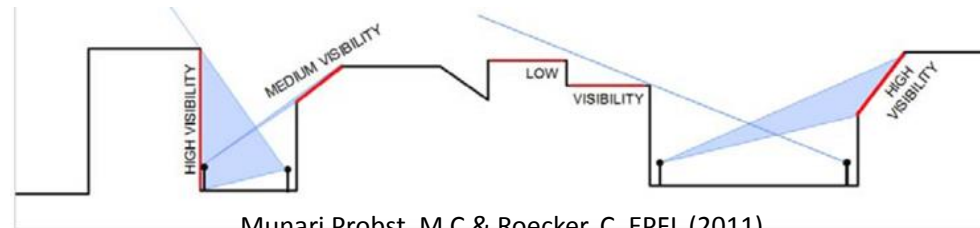
Lead: Marja Lundgren & Johan Dahlberg,  
White Arkitekter, Sweden



J. Kanthers, Lund University

## Existing urban areas

Lead: Maria Cristina Munari Probst &  
Christian Roecker, EPFL, Switzerland



Munari Probst, M.C & Roecker, C. EPFL (2011)

## Sensitive/protected landscapes

Lead: Alessandra Scognamiglio, ENEA, Italy



*Solar field in Reunion Island  
(Source: Akuo Energy)*

# Organization in Subtasks

## A. Legal Framework, Barriers and Opportunities

Subtask leader: Mark Snow, University NSW, Australia

Soon presenting!

## B. Processes, Methods and Tools

Subtask leader: Marja Lundgren & Johan Dahlberg, White Arkitekter, Sweden

Soon presenting!

## C. Case Studies and Action Research\*

Subtask leader: Gabriele Lobaccaro & Carmel Lindkvist, NTNU, Norway

## D. Education and Dissemination

Subtask leader: Tanja Siems & Katharina Simon, Wuppertal University, Germany

*\*) Action research involves the process of actively participating in an organization change situation whilst conducting research*

# Case Studies and Action Research – Subtask C

## D.C1 – Case studies



Subtask leaders: Gabriele Lobaccaro & Carmel Lindkvist, NTNU, Norway



# Case study report on website: <http://task51.iea-shc.org>

## Report C1

Illustrative Prospective of Solar Energy in Urban Planning:  
Collection of International Case Studies

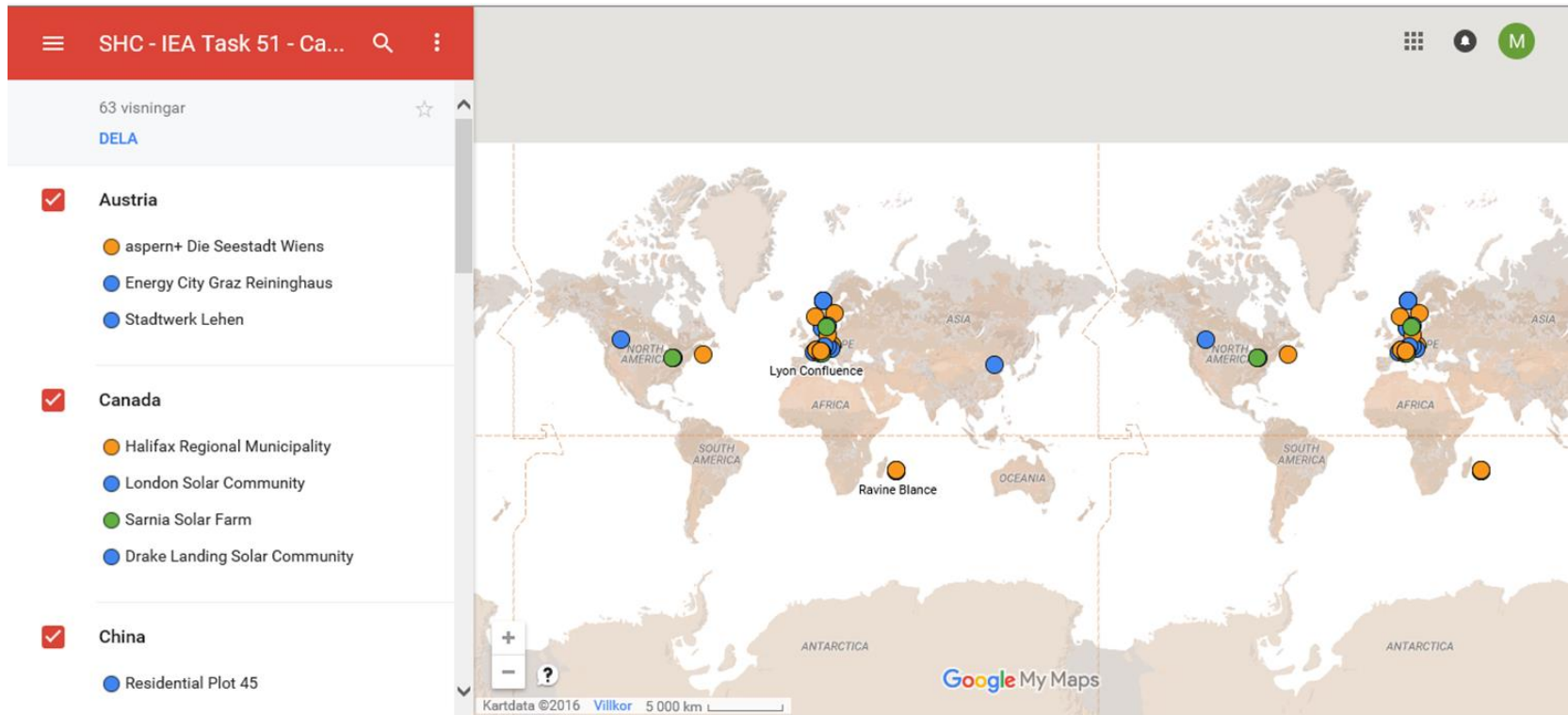
34 cases from 10 countries. 415 pages.

Results in report  
and brochures



*Subtask leaders: Gabriele Lobaccaro & Carmel Lindkvist, NTNU, Norway*

# Map with cases – soon available on website



Subtask leaders: Gabriele Lobaccaro & Carmel Lindkvist, NTNU, Norway

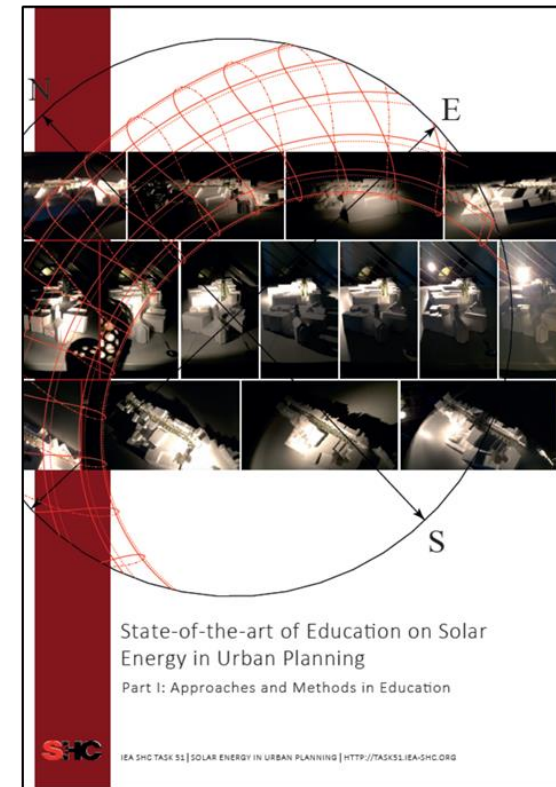
# Education and Dissemination – Subtask D

## State-of-the-art of Education on Solar Energy in Urban Planning

### Part 1: Approaches and Methods in Education

- On the website!

*Education and dissemination need to be strengthened to rapidly ensure that knowledge and support are offered for present and future professionals and educators*



*Subtask leaders: Tanja Siems & Katharina Simon, Wuppertal University, Germany*

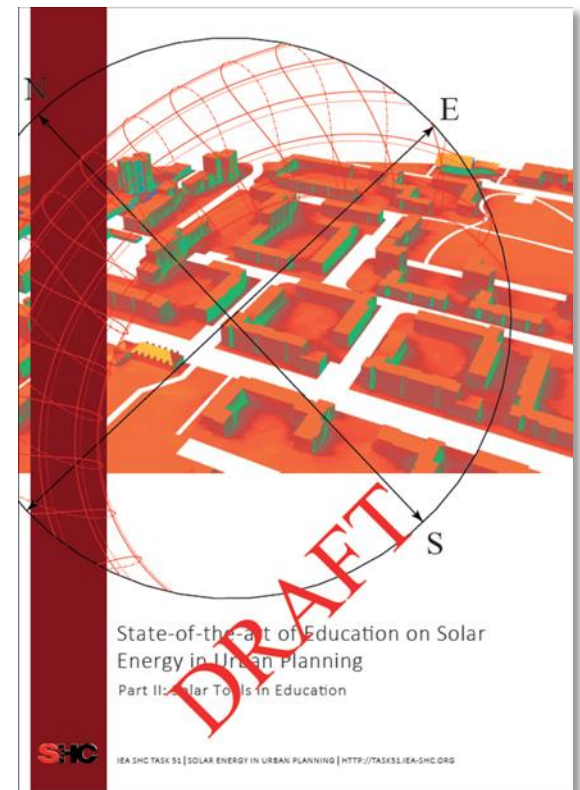
# Education and Dissemination – Subtask D

## State-of-the-art of Education on Solar Energy in Urban Planning

### Part 2: Solar Tools in Education

- In review. To be published.

- *compares experiences in using software tools in seminars at universities based on a design task example*
- *discusses the current development status of new research and teaching tools*



*Subtask leaders: Tanja Siems & Katharina Simon, Wuppertal University, Germany*

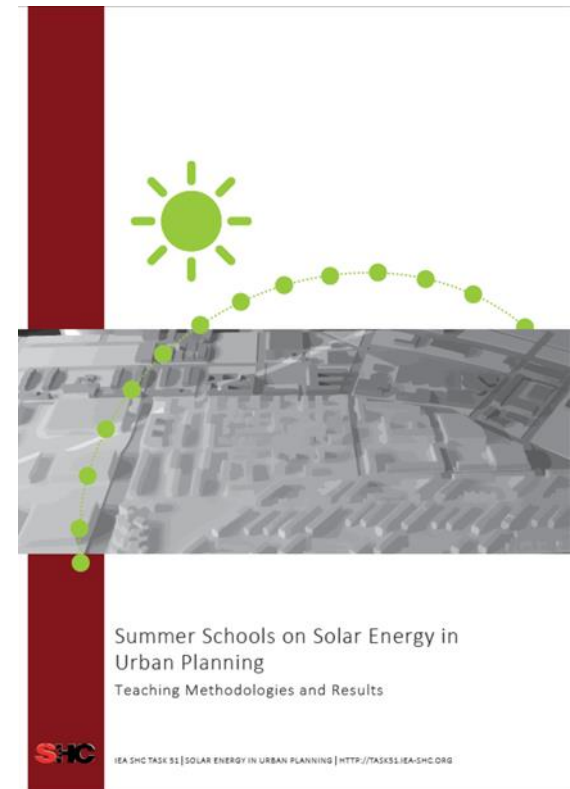
# Education and Dissemination – Subtask D

## Summer Schools on Solar Energy in Urban Planning – Teaching Methodologies and Results

- Published online
- Available in English and German



Photo: K. Simon, Wuppertal University, Urban Institute



Subtask leaders: Tanja Siems & Katharina Simon, Wuppertal University, Germany



# Website: Innovative Solar Products

REM, TechTile Therm

Via A. Volta 54 - 30020 Noventa di Piave (VE), Italy  
[info@remenergies.it](mailto:info@remenergies.it)  
<http://www.remenergies.it>





**ST "Integrability" characteristics**

Multifunctional element	+
Shape & size flexibility	+
Glazing: surface texture choice	+/-
Absorber: surface texture choice	+/-
Absorber colour choice	+/-
Joining options	+
Availability of dummies	+
Complete construction system	+

Techtile Therm is equipped with an array of 6 evacuated tubes diam. 47mm, length 1.500 mm. The vacuum gap is designed to capture the solar radiation with recycled materials. The main collector pipe is protected by a coloured aluminium structure and a fire-resistant insulation layer.

The system is composed of special polymeric tiles protecting the tubes equipped with a translucent glazing, with an impact on embodied energy and conversion efficiency. The product is both available as single elements and as pre-assembled panels, those including thermal and acoustic insulation by complying with the under-roof ventilation needs. The system is simply mounted as for a regular clay roof.

Photo: tecnorenergysun.it

Innovative solar products for building integration

HOME PHOTOVOLTAICS SOLAR THERMAL HYBRID CONTACT

IEA-SHC - Task 41 : Solar Energy & Architecture

## Innovative solar products for building integration

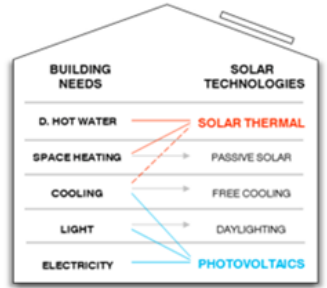
Sub Task A Architectural integration criteria

Learn more :

- Solar energy in buildings (PDF)
- Photovoltaic vs. Solar thermal (PDF)



Related links :

- <http://www.iea-shc.org/task41>
- <http://task51.iea-shc.org/>
- <http://www.iea-shc.org/task39>
- <http://leso.epfl.ch>
- <http://www.bipv.ch>
- <http://www.pvdatabase.org>
- <http://www.task7.org>
- <http://iea-pvps-task10.org>



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Developer: LESO-EPFL, Switzerland

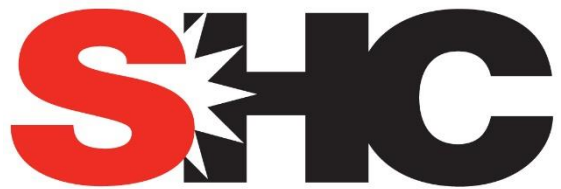
# More results...

- Different PUBLICATIONS, e.g. STATE-OF-THE-ART reports, GUIDELINES and improved or new METHODS AND TOOLS
- A web-based LEARNING PLATFORM, for education and dissemination
- Some results are already online. See: <http://task51.iea-shc.org/publications>
- More will come!

*Thank you!*



[www.iea-shc.org](http://www.iea-shc.org)



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