

The necessary change of our energy system requires a tremendous increase in using renewable energy. Solar heating and cooling technologies have a large potential to replace conventional energy sources especially when combined with energy efficiency measures. This is valid in the building sector as well as in the field of industrial applications.

Energy storage is a key technology for the increasing use of renewable energy, particularly to overcome the mismatch between fluctuating renewable energy sources (such as solar or wind) and load profiles.

This workshop provides an overview on the latest results and the status of technologies resulting from the related Implementing Agreements of the International Energy Agency (IEA).

Participants of this workshop will receive an overview on the results of international collaborative R&D work in the fields of the IEA Energy Conservation through Energy Storage Programme (ECES) and the IEA Solar Heating and Cooling Programme (SHC).



Image front page:  
PSE AG | Concentrating Fresnel collector solar cooling system | University Seville.

Images on this page from left to right:

1 Tecsol | Solar refrigeration technology for wine cooling with Fresnel collector and ammonia/water chiller, Tunisia. 2 Fraunhofer ISE | Multi-storey building "Buggingerstrasse 50" with passive house standard, Freiburg, Germany. 3 Fraunhofer ISE | Solar cooling system on a roof of a medical radiology practice, Berlin, Germany.

### Venue

Hochschule für angewandte Wissenschaften -  
Fachhochschule Rosenheim | University of Applied Sciences  
Hochschulstrasse 1  
83024 Rosenheim  
Germany  
www.fh-rosenheim.de

*(More detailed information about the meeting room and the directions will be sent after your registration by the end of September 2011.)*

### Supported by

Federal Ministry of Economics and Technology  
Bundesministerium für Wirtschaft und Technologie  
www.bmwi.de

### Organized by

Fraunhofer Institute for Solar Energy Systems ISE  
Heidenhofstrasse 2  
79110 Freiburg  
Germany  
www.ise.fraunhofer.de

### PSE AG

Emmy-Noether-Straße 2  
79110 Freiburg  
Germany  
www.pse.de

### Contact:

email: [info@shces.org](mailto:info@shces.org)

### Participation | Registration

The workshop is free of charge but the number of participants is limited. Therefore incoming registrations will be processed in order of arrival. So please make a binding registration at <http://cms.shces.org/register> by September 27<sup>th</sup>, 2011 at the latest.

### Finding a Hotel...

[www.touristinfo-rosenheim.de](http://www.touristinfo-rosenheim.de) → Accommodation  
[www.hrs.com](http://www.hrs.com)  
etc.

# »Key Technologies for Future Energy Systems - Solar Heating and Cooling and Energy Storage«

November 8<sup>th</sup>, 2011, Rosenheim, Germany



In our time, being a researcher in the field of energy storage and solar thermal energy use is almost a privilege, due to the fact that nowadays the majority of our society shares the belief that energy efficiency and renewable energy sources will play a key role for the energy future of mankind.

With its Energy Concept, the German government has formulated guidelines for an environmentally sound, reliable and affordable energy supply and for the first time mapped a road into the age of renewable energy. Scenarios show that upgrading the energy performance of the building stock is the central key to modernising our energy supply and achieving our climate protection targets. The Energy Concept not only defines the share of renewable energy concerning heat and electricity until 2050 but also the roadmap for retrofitting buildings and infrastructures.

The Federal Ministry of Economics and Technology has provided support for Germany's participation in the IEA-ECES and IEA-SHC Programmes for many years.

We are happy to invite you to this public workshop which will present the latest results from the IEA Tasks and hopefully will be an inspiring forum.

*Dr. Rodoula Tryfonidou*

*Federal Ministry of Economics and Technology  
(BMW)*

This workshop is kindly supported by



## »Key Technologies for Future Energy Systems - Solar Heating and Cooling and Energy Storage«

9:30 a.m. Check-in

### Welcome and Introduction

10:15 a.m. **Welcome**  
BMW

10:30 a.m. **Welcome and Overview ECES**  
Halime Paksoy | Cukurova University

10:45 a.m. **Welcome and Overview SHC**  
Werner Weiss | AEE INTEC

### Session 1: Buildings and Building-Related Activities; Industrial Application

**Chairman: Werner Weiss | AEE INTEC**

11:00 a.m. **Towards Net Zero Energy Solar Buildings**  
Josef Ayoub | Natural Resources Canada

11:15 a.m. **Applying Energy Storage in Ultra-low Energy Buildings**  
Fariborz Haghighat | Concordia University, BCEE

11:30 a.m. **Solar Renovation of Non-Residential Buildings**  
Fritjof Salvesen | KanEnergi AS

11:45 a.m. **Surplus Heat Management using Advanced TES for CO<sub>2</sub> Mitigation**  
Luisa Cabeza | Universidad de Lleida

12:00 p.m. **Large Solar Heating/Cooling Systems, Seasonal Storage, Heat Pumps**  
Jan-Erik Nielsen | Planenergi DK

12:15 p.m. **Solar District Heating**  
Manfred Reuss | ZAE Bayern

12:30 p.m. **Questions and Discussion**

12:45 p.m. Lunch

### Session 2: Cooling and Refrigeration - Final Workshop of IEA SHC Task 38

**Chairman: Volkmar Lottner | Forschungszentrum Jülich GmbH**  
1:45 p.m. **Short Introduction Green Chiller e.V.**  
Uli Jakob | Green Chiller e.V.

2:00 p.m. **Solar Air-Conditioning and Refrigeration -  
the overall Status and Perspectives**  
Hans-Martin Henning | Fraunhofer ISE

2:15 p.m. **Pre-engineered Systems**  
Dagmar Jähnig | AEE INTEC

2:30 p.m. **Sustainable Cooling with Thermal Energy Storage**  
Halime Paksoy | Cukurova University

2:45 p.m. **Custom-made Systems for Large Buildings**  
Wolfram Sparber | EURAC research

3:00 p.m. **Seasonal Cooling with Underground Thermal Energy Storage UTES**  
Aart Snijders | AIC Canada

3:15 p.m. **Life Cycle Assessment of Solar Cooling Systems**  
Marco Beccali | Università degli Studi di Palermo (DREAM)

3:30 p.m. **SHC Future Activities on Solar Cooling**  
Daniel Mugnier | TECSOL SA

3:45 p.m. **Questions and Discussion**

4:00 p.m. Break

### Session 3: Storage Technologies and Concepts Chairman: Halime Paksoy | Cukurova University

4:30 p.m. **Compact Thermal Energy Storage -  
Material Development**  
Andreas Hauer | ZAE Bayern

4:45 p.m. **Compact Thermal Energy Storage -  
System Integration and Application**  
Wim van Helden | ECN

5:00 p.m. **Storage for Industrial Applications**  
Rainer Tamme | DLR

5:15 p.m. **Electric Energy Storage:  
Future Energy Storage Demand**  
Christian Doetsch | Fraunhofer UMSICHT

5:30 p.m. **Questions and Discussion**

### Closing Remarks

5:45 p.m. Werner Weiss | AEE INTEC  
Halime Paksoy | Cukurova University