SHC SOLARUPDATE VOL.43 MARCH 2005

Newsletter of the International Energy Agency Solar Heating and Cooling Programme

INTERNATIONAL ENERGY AGENCY
Solar Heating & Cooling Programme

Solar Thermal Capacity Exceeds Market Expectations

The IEA Solar Heating and Cooling Programme and major solar thermal trade associations published solar thermal energy data for the first time in GWth, rather than in square meters of installed collector area. Based on this conversion, the global installed capacity to be 70 GWth (70.000 MWth).

Solar thermal energy's contribution to the global energy output has typically been measured in square meters of collector area. This is a unit of measurement that is not comparable with other energy sources, which are measured in electrical output. As a result, the energy output from solar thermal collectors has often been excluded from official renewable energy statistics. If the total heat demand were included in the energy balance, solar heating would come out as one of the major renewable energy sources.

"NOW THE SOLAR THERMAL CAPACITY SHOULD SHOW UP IN ALL STATISTICS ALONGSIDE THE CAPACITIES OF OTHER RENEWABLE ENERGIES. AND, SEEING THAT THE WORLD WIDE CAPACITY OF SOLAR THERMAL INSTALLATIONS EXCEEDS EVEN THAT OF WIND POWER, PEOPLE WILL REALIZE THAT OUR TECHNOLOGY CAN CONTRIBUTE TREMENDOUSLY TO REDUCING GREENHOUSE GAS EMISSIONS AND TO MAKING THE GLOBAL ENERGY SUPPLY MORE SUSTAINABLE."

Ole Pilgaard, President,
European SolarThermal Industry Federation (ESTIF)

continued on page 5

The New York Times Building -- Renzo Piano/ Fox & Fowle/ Gensler/Flack+Kurtz / Susan Brady Lighting/ LBNL

Linking Research to Practice at the New York Times Building

Participants in SHC Task 31: Daylighting Buildings in the 21st Century, are working to accelerate the development, application and market acceptance of high performance daylighting systems. One approach being used is to link technical advances with the interests of motivated manufacturers and innovative owners. The New York Times Building project is an example of this approach at work. This project, which builds on research results from SHC Task 31, is designed to use extensive field performance data in conjunction with a major building project to stimulate change in manufacturers' product offerings and ultimately promote broader market acceptance of daylighting systems.

continued on page 6

In This Issue

www.iea-shc.org

Moving Solar Assisted Air Conditioning to the Market

For over six years, experts from Austria, Denmark, France, Germany, Greece, Israel, Italy, Japan, Mexico, Netherlands, Portugal, and Spain worked together to improve conditions for the market introduction of solar assisted cooling systems. This collaboration has played a major role in increasing the attention given to solar air conditioning applications by not only solar collector companies and associations, but also by innovative air conditioning companies, planners, architects and building owners.

It is true that there are still few installations using solar energy in comparison to all centralized air conditioning installations, but the participants in IEA SHC Task 25, *Solar Assisted Air Conditioning of Buildings*, have worked to change this by initiating new installations, helping with system designs, and initiating or participating in new national and international (mainly EU) projects. To increase the market share of this technology, the Task participants addressed key barriers and identified two major niche markets.

The key barriers identified were:

- A lack of common design and construction practices.
- Limited understanding of the market availability of the technology and its environmental benefits.
- Absence of field data and experiences about solar air conditioning technology in buildings.

The major niche markets were:

- "Solar combi-plus systems" (DHW and heating plus cooling) for residential and small-commercial buildings.
- Applications with other added values besides energy savings—concern for the environment, green businesses, etc.

Table 1. Component Models Produced in IEA SHC Task 25

Component	Short Description	Source Code Open?	FORTRAN Code for TRNSYS?
Adsorption cooling machine	semi-physical steady-state models of the only two commercially available adsorption chillers (Japan)	yes	yes
Absorption cooling machine	physical steady state models for absorption chillers with mechanic solution pump and bubble pump (based on the Yazaki WFC 10)	yes	yes
Cooling tower	semi-empirical steady state model of an open cycle wet cooling tower	no	no
Solar system	physical steady state collector model and detailed model of stratified hot water tanks; the solar system model also includes the radiation processor	yes	no
Desiccant wheel	semi-empirical steady state model of desiccant wheels using manufacturer data from three manufacturers	yes	no
Air handling unit	physical steady-state model of the air states in an air handling unit depending on operation mode and component performance	yes	no
Room components	physical steady-state models of major room components such as fan-coils and radiative ceilings	yes	no
Control strategy	control to decide about the activation of system components depending on actual comfort demands (temperature and humidity control)	no	no

The Technology

There are two major types of systems:

- Open cycles, or desiccant cooling systems, used for direct treatment (cooling, dehumidification) of air in a ventilation system.
- Thermally driven chillers used to produce chilled water for use in any type of air conditioning equipment.

Open Cycles – Desiccant Cooling Systems

While thermally driven chillers produce chilled water, which can be supplied to any type of air conditioning equipment, open cooling cycles directly produce conditioned air. Any type of thermally driven open cooling cycle is based on a combination of evaporative cooling with air dehumidification by a desiccant (i.e., a hygroscopic material). Either liquid or solid materials can be used. The standard cycle, which is used most often, uses rotating

continued on page 3

 continued from page 2

desiccant wheels, equipped with either silica gel or lithium-chloride as sorption material.

Systems using liquid sorption materials have several advantages, such as higher air dehumidification at the same driving temperature and the possibility of high energy storage by means of concentrated hygroscopic solutions. Several new systems are close to market introduction.

In the field of open cooling cycles most new developments are focused on the application of liquid sorption due to its inherent above-mentioned advantages.

Thermally Driven Water Chillers

The dominating technology of thermally driven chillers is absorption chillers. The basic physical process consists of at least two chemical components, one serving as the refrigerant and the other as the sorbent. Absorption chillers are available on the market in a wide range of capacities and designs for different applications. However, for a long time few systems were available in a range below 100 kW of cooling capacity. Recently, machines have been developed that provide small cooling capacities in the range of 20 kW and lower. For air conditioning applications, absorption chillers using the sorption pair water-lithium bromide (LiBr) are primarily used, but ammonia-water systems also are used, mainly in applications requiring where temperatures below 0°C. Under typical operating conditions, with a temperature of the driving heat of about 85-95°C, these systems achieve a COP of about 0.6.

In addition to systems using a liquid sorbent, there are machines using solid sorption materials. In these cycles, a quasi-continuous operation requires that at least two compartments, which contain the sorption material, are operated in parallel. The systems available on the market use water as the refrigerant and silica gel as the sorbent. To date, only two Japanese manufacturers produce adsorption chillers. Under typical operating conditions, with a temperature of the driving heat of about 80°C, these systems achieve a COP of about 0.6.

In recent years, there have been many new developments in the commercialization of water chillers with small cooling capacities. They are based on many different technologies ranging from advanced lithium bromide-water cycles using innovative rotary absorber-generator units over ammonia-water systems and advanced adsorption systems with high power densities to systems incorporating thermochemical storage using a salt-hydrate pairing. These

continued on page 5

publications

Solar-Assisted Air-Conditioning in Buildings – A Handbook for Planners. A book that is available from Springer-Verlag Wien/NewYork (www.springer.at); ISBN 3-211-00647-8.

Ongoing Research Relevant for Solar Assisted Air Conditioning of Buildings. A technical report that is available on the Task website (www.iea-shc-task25.org)

SOLAC. A computer design tool that allows architects and planners to carryout feasibility studies in a very straight forward and user-friendly way. Users can design many different configurations of solar assisted air conditioning systems based on an annual simulation, and calculate the annual energy balance and compute a complete cost breakdown including annual cost. To be available on the Task website (www.iea-shc-task25.org)

Decision Scheme for the Selection of the Appropriate Technology Using Solar Thermal Air-Conditioning. A technical document for system selection ("decision tree"). To be available on the Task website (www.iea-shc-task25.org) in early 2005.

Solar Assisted Air-Conditioning Demonstration Projects a technical report on the demonstration projects of Subtask D. To be available on the Task website (www.iea-shc-task25.org) in early 2005.

Table 2. IEA SHC Task 25 Demonstration Systems

Country	Application/ Building	Site	System type	Cooling capacity	Collector gross area	Collector type
-	-	-	-	kW	m^2	-
Netherlands	Offices	Waalwijk	Desiccant, solid	22	33	FPC
Germany	Laboratory	Freiburg	Adsorption	70	170	ETC
	Cooling network	Berlin	Absorption	70 (2 x 35)	229	FPC
	Offices	Berlin	Absorption	70 (2 x 35)	348	ETC
	Seminar room	Freiburg	Desiccant, solid	50	100	SAC
Austria	Offices, lecture room	Hartberg	Desiccant, solid	30	12	ETC
Spain	Library	Mataro	Desiccant, solid	55	105	SAC
Israel	Offices	Haifa	Desiccant, liquid	4.5	20	FPC
France	Offices	Guadeloupe	Absorption	35	123	ETC
	Offices	Sophia-Antipolis	Absorption	35	58	ETC
Portugal	Offices	Lisbon	Desiccant, solid	36	51	CPC

Abbreviations: FPC = flat plate collector; ETC = evacuated tube collector; SAC = solar air collector; CPC = stationary concentrating collector products are still not well established in the market, but promise to open new market segments for solar air conditioning in small commercial buildings (e.g., offices, small hotels, etc.) and even residential buildings.

Removing the Barriers

To begin removing the barriers facing solar assisted cooling systems, Task participants:

- Defined the performance criteria of solar assisted cooling systems, which includes both energy and economic performance. This work is detailed in the book, Solar Assisted Air Conditioning in Buildings - A Handbook for Planners and the design tool, SOLAC. (See Table 1 for component models produced).
- Identified and further developed promising solar assisted cooling technologies. This work is summarized in the report, Ongoing Research Relevant for Solar Assisted Air Conditioning Systems.
- Worked to optimize the integration of solar assisted cooling systems into the building and the HVAC system. As most project buildings already existed at the start of the Task, this work focused primarily on optimizing the primary energy savings – cost performance of the HVAC system, including its controls and operation. To increase the use of these tools by targeted users (e.g., engineers and planners), the design tools and concepts are being translated into different languages and workshops and seminars were held.
- Monitored 11 demonstration projects in six countries. Although it was difficult to obtain long periods of reliable measurement data, many valuable results were documented. (See Table 2 for projects).

Reaching the Market

As a result of industry workshops and Task meetings, two major market niches have been identified:

- Solar combi-plus systems. In central Europe about one-third of all installations using solar thermal collectors are solar combisystems (i.e., systems that produce hot water and contribute to the house heating) with a solar fraction typically between 20 - 50% (depending on the system design, building standard, climatic conditions, etc.). These systems are oversized for the heating needs in summer so both the companies producing the solar systems and the end-users are interested in another useful application of the solar system during the summer. At the same time, the demand for air conditioning in offices and houses continues to grow. Here lies a very interesting market niche for solar thermally driven air conditioning. In general, small capacities are required for this type of applications since solar combisystems are mainly installed in private houses and small commercial buildings.
- Applications with added value. In most cases, solar energy use for air conditioning is still not economically feasible. Therefore, a second market niche would be for applications characterized by conditions other than economic factors. This is often the case in buildings where the owner is committed to an environmentally friendly business. Examples of such businesses are banks and hotels in tourist areas. In these cases, the overall design for the thermal energy supply needs to include solar.

A solar driven absorption cooling system is used at the German Traffic Ministry in Berlin, Germany. Pictured are the absorption machines (2 x 35 kWcool) and the flat plate solar collectors (229 m^2).

What's Next?

Compared to the situation five years ago, solar cooling has made remarkable progress. Far more systems are in operation today and there are more documented experiences regarding their operation. Combined with the new developments in the area of thermally driven cooling technology, the potential for solar assisted cooling applications is growing. However, far more experiences at the system level are necessary and a broad dissemination of the lessons learned to the target audiences is needed. Best practice solutions also need to be documented in order to serve as references for new projects. And, cost reductions for the components, systems and design processes must be achieved in order to make this technology economically competitive.

Based on current technologies (i.e., market available thermally driven cooling devices and market available solar collectors) solar assisted air conditioning can lead to remarkable primary energy savings if the systems are properly designed. Pre-conditions necessary

continued on page 5

capacity exceeds market continued from page 1

To address this underestimation, the IEA SHC Programme and solar thermal trade associations from Europe and North American held a meeting to agree upon a methodology to convert installed collector area into GWth of installed capacity of solar collectors. The definition that was chosen is similar to that for photovoltaic modules. Because the conversion factor is nearly the same for all collector types, it was decided to use one factor that is 0.7 kWth per m^2 of solar collector area for all collector types. A detailed description of the method can be found on the SHC website (www.iea-shc.org).

> "The worldwide contribution of solar thermal installations to meeting the thermal energy demand for applications such as hot water or space heating has been greatly underestimated in the past. With an installed capacity of 70 GWth solar thermal is one of the leading sources of renewable energy world wide. And its potential is much, much higher."
>
> Michael Rantil,
> Chairman of the IEA
> SHC Programme

Using this conversion factor, the statistics show the global installed capacity to be 70 GWth (70.000 MWth), making solar thermal one of the leading sources of renewable energy world wide. In Figure 1, solar thermal capacity is compared with the capacities of photovoltaic and wind power as published in UNDP's World Energy Assessment.

To advance this important relationship, the SHC Programme and key solar thermal trade associations in Australia, Europe and North America have signed a Memorandum of Understanding (MOU). In addition to supporting each other's objectives, the signatories agree to support activities that:

- share the vision that the solar thermal potential can provide 10-15% of the total energy demand in the OECD countries by 2025 (within the boundaries of a level playing field);
- increase the awareness of national and international government bodies and policy makers of this potential and therefore create a higher sense of urgency in its realization; and
- incorporate R&D results into new products and services by industry in order to open new applications and markets.

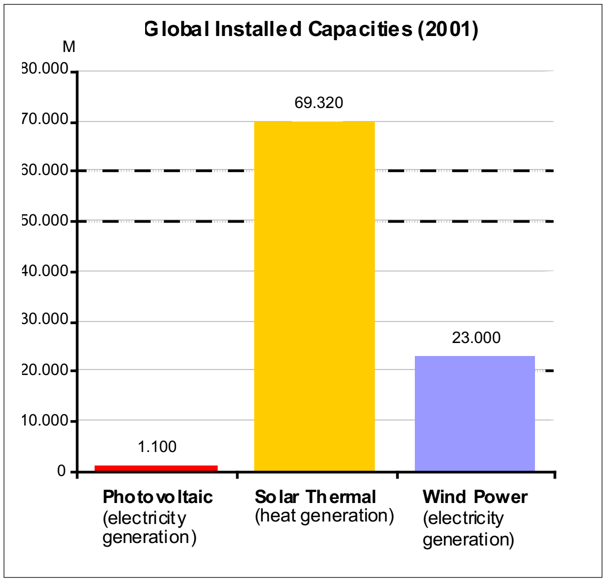

Figure 1. Global Installed Capacities in 2001

Signatories of the MOU to date are the IEA SHC Programme, Australian Business Council for Sustainable Energy, Austrian Solar Association, Canadian Solar Industries Association, European Solar Thermal Industries Federation, German Solar Energies Association, Holland Solar, Solar Energy Association of Sweden, and US Solar Energy Industries Association.

Solar thermal trade associations interested in joining this effort should contact Michael Rantil, SHC Chairman, Michael.Rantil@formas.se.

solar cooling continued from page 4

to achieve primary energy savings are a sufficient collector size and a suitable size of energy storage in the system.

With increasing energy prices, increasing shortages of existing electricity supply due to air conditioning during summer, and increasing environmental concerns regarding conventional refrigerants—solar air conditioning will be a very attractive solution in the future.

For more information and Task results visit the Task web site (www.iea-shc-task25.org) and read the feature article in the SHC 2004 Annual Report on the main SHC website, www.iea-shc.org.

 continued from page 1

The 51-story New York Times building, designed by Renzo Piano Design Workshop, is under construction in central Manhattan. The building is designed to meet the owner's desire for all occupants to have views and access to daylight, and for the building to be energy efficient. Unable to find "off-the-shelf" system solutions that would work reliably and were affordable, the Times approached Lawrence Berkeley National Laboratory (LBNL) who had carried out prior daylighting field studies as part of SHC Task 21, Daylight in Buildings. The Times and LBNL agreed to work together to solve the technical issues surrounding system integration through field testing.

Receiving funding from the New York State Energy Research and Development Authority, the U.S. Department of Energy and the California Energy Commission, LBNL constructed a full scale 401m^2 one- story mockup near the site of the new building. The southwest corner of the building was reproduced, fully furnished and divided into two areas where two different roller shade manufacturers and two different manufacturers of dimmable lighting systems installed commercially available systems with different types of sensors and control strategies. With a window-to-exterior wall ratio of 0.76 and a glazing transmittance of 0.75, daylight was abundant throughout the perimeter zone. The solar heat gain was controlled with a spectrally selective glazing and an array of exterior fixed ceramic rods designed to block and diffuse sunlight. It was recognized that additional controls were needed for summer heat gain and glare so automated interior roller shades were planned in conjunction with dimming lighting controls.

Monitored data were collected from December 2003 to June 2004 to capture the full range of solar conditions. During this time, manufacturers tuned their systems to obtain optimal performance and improved their designs. A limited subjective study to determine occupant satisfaction was conducted, detailed illuminance and power measurements were made and luminance maps recorded at various critical task locations under a wide range of climate conditions within the wok environment. The objective of these tests was not to perform a side-by-side comparison of the two competing systems, but rather to understand how vendor decisions regarding control infrastructure and design might impact the actual field operation. Based on this work, a competitive performance-based procurement specification was offered to all vendors; as a result created a competitive price response from the entire industry.

Bids have now been accepted for lighting and shading controls and procurement contracts signed. The owner has taken on the role of the systems integrator, with ongoing technical support from LBNL. Each successful vendor has reinstalled the winning bid systems in the building mockup. The systems will be tested for several months to confirm their performance and to verify the calibration and commissioning processes to be used in 2006 in the actual building. The control logic for the shades was designed largely to respond to glare and lighting quality, and the dimmable lights are controlled to capture daylight savings.

In the original test period, the window and automated shade system provided sufficient daylight through a deep perimeter zone enabling significant dimming of the electric lighting throughout most of the zone. Daylighting energy savings of the southwest zone ranged from 50-70% at 3.0m from the west or south windows to 40-45% at 4.6-7.6m from the window for the winter period, with higher savings expected in summer. The low sun angles of the southwestern exposure caused the worst case situation for glare, but proper selection of the shade fabric and specification of the control sequences was shown to provide adequate control.

This project proves the performance claims that integrated systems operation can be reliable and robust. And, it has begun the process of transforming the application of integrated daylighting solutions from expensive niche-market applications to widespread, affordable solutions. Potential building owners now have access to information on these technologies that can be specified, installed, commissioned, operated, and maintained before they are actually procured. The achievements of this project have been:

continued on page 9

The interior NW view on a hazy day shows placement of illuminance sensors. The shades are deployed to the lower edge of the upper exterior shading rods.

The full scale mockup of the New York Time Building.

SHC in brief

News from the Solar Heating and Cooling (SHC) Programme and updates on solar activities from Member countries.

New PV/Thermal Solar Systems Work

In January 2004, the kick-off meeting of IEA SHC Task 35, *PV/Thermal Solar Systems* was held in Copenhagen Denmark. Twenty-two experts from Canada, Denmark, Germany, Greece, Hong Kong, Israel, The Netherlands, Spain, Sweden, and Switzerland attended the two day meeting.

The objective of this new Task is to catalyze the development of high quality and commercially competitive PV/thermal (PV/T) solar systems. To achieve this, the task will focus on increasing the general understanding of this technology, developing components, contributing to the definition of internationally accepted standards, and providing key commercial selling points for PV/thermal solar systems.

The Task is divided into five subtasks:

- Market and Commercialization of PV/T
- Energy Analysis and Modelling
- Product and System Development, Tests and Evaluation
- Demonstration Projects
- Dissemination

The results of this work will be relevant to the researchers and designers of collector components and specific PV/thermal power systems and to the conventional PV industry.

For further information and possibilities for participation, please contact the Operating Agent, Henrik Sørensen, Esbensen Consulting, h.soerensen@esbensen.dk and the Task website at www.iea-shc.org.

Industry Workshop on Solar Heat for Industrial Processes

An industry workshop, organized by IEA SHC Task *33/SolarPaces Task IV, Solar Heat for Industrial Processes*, was held in February 2005 coinciding with the 9th Energy and Environment Trade Fair, GENERA05. The workshop, attended by 70 people, had two main purposes to provide a general overview of industrial processes and to discuss the situation in Spain.

During the morning session, technical lectures were given to address the questions:

- What are the most suitable industrial processes to be coupled with energy from solar thermal?
- Is the use of solar thermal a real option for industrial processes? Topics included the availability of state of the art technology, integration of solar thermal in industrial processes, examples of installations, and subsidies and financial support opportunities in Spain.
- What is IEA SHC Task 33/SolarPaces Task IV?

In the afternoon, a round table discussion focused on how key Spanish institutions could promote solar heat in industrial processes. Participants included representatives from the Spanish Educational Ministry, Institute for Energy Diversification and Saving (IDEA), Madrid Secretary for Industry, Energy and Mining, CIEMAT (e.g., research institutions), and ASIT (e.g., solar thermal industry associations).

For further information and possibilities for participation, please contact the Operating Agent, Werner Weiss, w.weiss@aee.at.

New Portuguese Solar Initiative

The Portuguese Government has approved a package of legislative measures that will require all new and renovated buildings to install solar thermal collectors for hot water production, if the roof or cover runs SE and SW.

There are some rules and exceptions that can be expected, but the main objective is to increase the use of the sun to heat water, which is a highly efficient and economic method in Portugal. This is important legislation, particularly since the Portuguese market is one of the smallest in Europe, below 10.000 m^2/year, but with a goal of 150.000 m^2/year.

Although this measure was a long time in coming, the timing is right. In 2002, the Government set in place a set of instruments that will support the growth of the solar energy market. These instruments include courses at the Renewable Energy Department of INETI, a state laboratory; a certification scheme for solar collectors and small solar systems; a 6-year guarantee of the certified installation; technical and informational brochures; and workshops. A media campaign is also being considered at the request of the Portuguese Solar Energy Society (SPES) and the Portuguese Solar Energy Industry Association (APISOLAR).

The complete texts of the codes and Building Certification Rules are to be published in the Official Portuguese Governmental Journal.

solar marketplace

The Solar Heating and Cooling (SHC) Programme is not only making strides in R&D, but also impacting the building sector. This section of the newsletter highlights solar technologies that have been developed or conceptualized in a SHC Task and are now being commercially manufactured, marketed or used.

Solar Coffee Drying Plant Opens in Costa Rica

With the support of the IEA SHC Task 29: *Solar Crop Drying*, a cutting-edge solar coffee-drying test site in Tilaran, Costa Rica was installed in 2004. This is the largest of its kind in Central America. The Coopeldos R.L. plant, a coffee-growing cooperative, uses 850m^2 of Conserval's Solarwall® panels on the roof and intake fans to draw in warmed air from the perforated panels to dry the coffee beans.

For Coopeldos R.L., this is a great opportunity because the previous system was fueled by wood. The project was initiated based on a study by the IEA Solar Heating and Cooling Programme that found solar crop-drying systems result in significant energy savings, reduced use of fossil fuels and lower GHG emissions. The Tilaran facility is one of six test sites — the others are in Panama, China and India. These sites are expected to reduce carbon dioxide emissions by 1,000 tons a year, primarily by displacing fossil fuels. The projects in Costa Rica and Panama are also helping to prevent deforestation by reducing the amount of wood burned.

The Coopeldos R.L. coffee plant in Costa Rica is one of six IEA SHC solar drying projects. Monitoring began with the 2004/2005 drying season, and the results will be analyzed and documented on the SHC web site, www.iea-shc.org/task29.

Best Practices in Lighting – A Series of Australian Seminars

The proposed Australian Lighting Innovation Centre is a collaborative network consisting of the Australian Electrical and Electronic Manufacturers' Association, Property Council of Australia, Institution of Engineers Australia, Royal Australian Institute of Architects, Illuminating Engineering Society of Australia and New Zealand, Lighting Council Australia, International Association of Lighting Designers, Queensland University of Technology, University of Sydney, Deakin University, Griffith University, and the Queensland Government. It will provide services for the research, development, commercialisation, education and provision of information and expertise in best practice lighting solutions that provide human, environmental and economic outcomes.

In 2004, seminars were held in all the Australian state capital cities as well as Canberra (the National capital) and Cairns (a strategic North Queensland provincial centre). The seminars reached approximately 320 people, with the dominant professions represented being electrical engineers, facility managers, architects, and lighting designers. The material developed for the seminars is currently being transferred into a permanent resource of printed publications and a website.

Considering that this was the first of these seminar projects (with possibly more in the future), priority was given to addressing lighting's basic principles and the integration of lighting, design and technologies , within the whole of building and ESD framework. Highly advanced technologies and practices were not dealt with in detail.

The project brought an internationally acclaimed expert in daylighting to Australia (Stephen Selkowitz, LBNL, a Subtask Leader in IEA SHC Task 31: *Daylighting Buildings in the 21st Century*), to provide knowledge and insight into the leading best practices in daylighting. Other speakers included a number of internationally respected experts on the international scene from Australia, as it was considered that local participation was important in making a statement about local expertise, including Steve Coyne of Queensland University of Technology and IEA SHC Task 31.

The issues raised by the audiences regarding in terms of achieving daylighting in fo buildings were:

- The lack knowledge of "rules of thumb" which can be used when arguing the case for daylighting in the early planning (pre-design) stage.
- The lack of basic performance figures for various "families of daylighting strategies" (e.g., light shelves, skylights,

continued on page 9

marketplace continued from page 8

automated blinds, spectrally selective glazing) without which arguments for daylighting cannot be critically debated with any chance of success.
- The availability of software and where it should be used in the design process.

These issues were a reconfirmation of the importance of IEA SHC Task 31's work to create a roadmap to assist general professionals with design guidance, the use of daylighting tools, and where in the design process to use them. The roadmap is to be published in September 2005.

For further information contact Steve Coyne, s.coyne@qut.edu.au

ny times building continued from page 6

- Direct experience with, and improvement to, commercially available daylighting systems.
- A better understanding of performance and user acceptability issues.
- Confirmation of the added-value benefits for employees and building operations.
- The need to fine-tune product specifications for the unique owner requirements.
- Clarification of the logistics on implementing the installation in the final building.
- Demonstration of the need for in-house expertise to modify and maintain the systems.

Most building owners are risk averse and coupled with the uncertain performance of simulation tools, occupant responses, high initial cost, and commissioning difficulties, the acceptance of integrated daylighting solutions is hindered. The New York Times project proves that integrated daylighting solutions are a reliable and robust option. Over the course of the Times field test program, over 200 building professionals (e.g., architects, engineers, consultants and owners) visited the mockup and saw the results first hand. As a result, many have expressed an interest in using the project results in their buildings. LBNL's technical support to the Times benefited from ongoing collaborations with IEA SHC Task 31 participants, and it is hoped that the lessons learned from this project in the U.S. will benefit both the research and application of integrated daylighting solutions in other IEA countries.

For more information contact Stephen Selkowitz, SHC Task 31 Subtask Leader, LBNL seselkowitz@lbl.gov.

Thanks To…

Maria Luisa Delgado Medina of CIEMAT who served as the Spanish Executive Committee member for six years. The Committee thanks her for her contributions to this Programme.

Hans-Martin Henning, who served as the Operating Agent for Task 25, Solar Assisted Air Conditioning of Buildings. Dr. Henning has the distinction of running the SHC Programme's first Task on solar air conditioning. The Executive Committee thanks him for his dedicated and valuable work, and looks forward to possible future collaboration.

Welcome To…

Manuel Romero, Director of the Renewable Energy Division at CIEMAT, who is the new Executive Committee representative for Spain.

IEA SHC programme

The International Energy Agency was formed in 1974 within the framework of the Organization for Economic Cooperation and Development (OECD) to implement a program of international energy cooperation among its member countries, including collaborative research, development and demonstration projects in new energy technologies. The 20 members of the IEA Solar Heating and Cooling Agreement have initiated a total of 35 R&D projects (known as Tasks) to advance solar technologies for buildings. The overall program is managed by an Executive Committee while the individual Tasks are led by Operating Agents.

Current Tasks and Operating Agents

TASK 27
Mr. Michael Köhl
Fraunhofer Institute for Solar Energy Sytems
Heidenhofstr. 2
D-79 110 Freiburg
GERMANY
michael.koehl@ise.fraunhofer.de

SHC TASK 28/ ECBCS Annex 38
Mr. Robert Hastings
Architecture, Energy & Environment GmbH
Kirchstrasse 1
CH 8304 Wallisellen
SWITZERLAND
robert.hastings@aeu.ch

TASK 29
Mr. Doug Lorriman
20 Tiny Beaches Rd. N.
Site 8, Comp. 8
Perkinsfield, ON L0L 2J0
CANADA
douglorriman@rogers.com

TASK 31
Dr. Nancy Ruck
79 Amaroo Drive
Smiths Lake, NSW 2428
AUSTRALIA
ncr1@austarnet.com.au

TASK 32
Mr. Jean-Christophe Hadorn
BASE CONSULTANTS SA
51 Chemin du Devin
CH-1012 Lausanne
SWITZERLAND
jchadorn@baseconsultants.com

TASK 33
Mr. Werner Weiss
AEE INTEC
Feldgasse 19
A-8200 Gleisdorf
AUSTRIA
w.weiss@aee.at

SHC TASK 34/ECBCS Annex 43
Ron Judkoff
Director, Buildings & Thermal Systems Center
National Renewable Energy Lab
1617 Cole Blvd.
Golden, CO 80401
UNITED STATES
ron_judkoff@nrel.gov

TASK 35
Mr. Henrik Sørensen
Esbensen Consulting Engineers Ltd.
Carl Jacobsens Vej 25D
Sukkertoppen-Copenhagen
DK-2500 Valby
DENMARK
h.soerensen@esbensen.dk

SOLARUPDATE
The Newsletter of the IEA Solar Heating and Cooling Programme

No. 43, March 2005

Prepared for the IEA Solar Heating and Cooling Executive Committee
by
Morse Associates, Inc.
2012 O Street, NW, Suite 24
Washington, DC 20036 USA

Editor:
Pamela Murphy

www.iea-shc.org

Member Countries

AUSTRALIA	Mr. C. Blair
AUSTRIA	Prof. G. Faninger
BELGIUM	Prof. A. De Herde
CANADA	Mr. D. McClenahan
DENMARK	Mr. J. Windeleff
EUROPEAN COMMISSION	Mr. P. Menna
FINLAND	Mr. J. Piirto
FRANCE	Mr. Y. Boileau
GERMANY	Dr. V. Lottner
ITALY	Dr. P. Zampetti
MEXICO	Dr. I. Pilatowsky
NETHERLANDS	Mr. Lex Bosselaar
NEW ZEALAND	Mr. M. Donn
NORWAY	Mr. F. Salvesen
PORTUGAL	Mr. J. F. Mendes
SPAIN	Mr. M. Romero
SWEDEN	Mr. M. Rantil
SWITZERLAND	Mr. U. Wolfer
UNITED KINGDOM	Prof. D. Strong
UNITED STATES	Mr. D. Crawley

Executive Committee Members

CHAIRMAN
Mr. Michael Rantil
FORMAS
Box 1206, SE-111 82 Stockholm, Sweden
Tel: +46-8-775 40 67
Fax:+46-8-775-40-10
e-mail: michael.rantil@formas.se

EXECUTIVE SECRETARY
Ms. Pamela Murphy
Morse Associates, Inc.
9131 S. Lake Shore Dr.
Cedar, MI 49621, USA
Tel: +1/231/228 6017
Fax: +1/231/228 7016
e-mail: pmurphy@MorseAssociatesInc.com