

Newsletter of the
International Energy
Agency Solar Heating
and Cooling Programme



SHC Solar Award Saluts Canadian Company

The recipient of the 2013 SHC Solar Award is the Drake Landing Company of Alberta, Canada – a perfect example of successful collaboration. The company, comprised of four organizations, United Communities (developer), Sterling Homes (builder), ATCO Gas (utility), and the Town of Okotoks (municipality), was formed to oversee ownership and operation of the Drake Landing Solar Community. The community uses solar thermal collectors and borehole heat storage to provide space heating to 52 homes, and recently set a new world record of 98% solar heating performance.

Bruce Littke from ATCO Gas and Keith Paget from Sterling Homes received the award on behalf of the Drake Landing Company at *SHC 2013: International Conference on Solar Heating and Cooling for Buildings and Industry* in Freiburg, Germany.

The SHC Solar Award is given to an individual, company, or private/public institution that has shown outstanding leadership or achievements in the field of

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▲ Canada's Drake Landing Company receives SHC Solar Award. Recipients Bruce Littke from ATCO Gas (2nd from left) and Keith Paget from Sterling Homes (3rd from left) are joined by Doug McClenahan, Canadian SHC Executive Committee member (1st from left) and Werner Weiss, SHC Programme Chair (4th from left).

Exhibition Showcases Innovative Polymeric Collectors and Components

A highlight of the SHC 2013 conference was the showcase of innovative polymeric collectors and components. With the aim to highlight novel designs and research trends for cost-efficient solar thermal systems, *SHC Task 39: Polymeric Materials for Solar Thermal Applications* selected promising polymeric collectors and storage tanks and placed them on an exhibition truck in front of the conference venue. The unique assembly of the most up-and-coming polymer based products demonstrated the first tangible results of SHC Task 39's research and underlined the high potential of plastics for the future solar thermal energy sector.

"On the road to a new generation of solar thermal energy" was the motto of the exhibition that hosted some of the most innovative solar thermal products of polymeric materials. Next to scalable collectors for building integration by the Norwegian

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SHC 2013 Exhibit *from page 1*

company Aventa AS, SHC Task 39 showcased polymeric collectors of the Israeli company Magen Ecoenergy, the solar air collector LUBI by the Canadian Enerconcept Technologies as well as storage tanks by the German manufacturers Roth and Consolar, and novel components and material combinations by the Austrian research institute Wood K-Plus. Current research activities were presented by the SHC Task 39 partners of ITW Stuttgart (Germany), PCCL, the University of Leoben and Sunlumo (Austria), who took the opportunity to present their projects and offered guided tours through the exhibition truck.



▲ **Figure 1. SHC Task 39 outdoor exhibit at SHC 2013 in Freiburg, Germany.**
(Photo: Fraunhofer ISE)

Novel design and cost-efficiency

The exhibits distinguish themselves from standard collectors and components in their material choice and also decisively in their design. The Aventa solar collector, for example, is specifically fashioned as an architecturally appealing building element (see Figure 2). Based on extruded PPS and PC it can be easily adjusted to any wall or facade structure. Variations in color allow for visual integration and make Aventa collectors frontrunners in terms of practicability and aesthetical quality. Magen's eco-SPARK® and eco-FLARE® collectors, in turn, consist of specially formulated polymeric compounds suited for the effective operation in sunny and Mediterranean countries. Both collectors can be applied in thermosiphon

systems and are widely installed in large commercial applications (eco-FLARE®, Figure 3, left) or in systems for swimming pool heating and domestic hot water preparation (eco-SPARK®, Figure 3, right). All polymeric solar collectors such as these are perfectly compatible with a range of new polymeric storage tanks. Solutions for space saving, lightweight storages were shown by the German manufacturers Roth and Consolar.

A special highlight of the exhibition was the prototype of a fully polymeric thermisophon (patent pending) conceptualized in the frame of the

The Task 39 Exhibition has had a great impact on the visitor's acceptance of polymeric materials in solar systems. The exhibit demonstrated that there already exist some quite interesting and above all reliable and efficient products.

MICHAEL KÖHL
Operating Agent of SHC Task 39

European project SCOOP. Therm-X is the result of a study on low-cost collectors for sunny regions and built by a team from Fraunhofer ISE. This design is based on extruded Polypropylene twin wall sheets that offer the possibility of mass production. The exhibited prototype has a collector area of 1.2m² and a storage capacity of 65 liters.

A world of possibilities

The SHC Task 39 Exhibition opened up a world of possibilities for rethinking solar thermal. The showcase perfectly demonstrated that polymers in solar thermal are not just wishful thinking, but a factor to be reckoned with. When it comes to aspects like cost-reduction, mass production and easy installation, plastics are a possible way to pursue, and may in fact be the key to push, the market penetration of solar thermal installations yet again. With this objective, the Exhibition perfectly



▲ **Figure 2. Scalable Aventa solar collectors for facade and building integration.**
(Photo: Fraunhofer ISE)

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“The Drake Landing Solar Community is a clear number one in many respects,” said Werner Weiss, chairman of the IEA SHC Programme. “It is the first large-scale solar district heating system with seasonal storage in North America. And, it is the first in the world designed to provide over 90% of the space heating load from solar energy. Having achieved its goal, it has become a stellar example for solar heating and cooling worldwide.”

WERNER WEISS
IEA SHC Chairman

solar heating and cooling, and that supports the work of the IEA Solar Heating and Cooling Programme.

The Drake Landing Company is the 8th recipient of the SHC Solar Award and the first company to receive this honor in recognition not only of the project’s excellent results, but also the pioneering spirit of the involved partners. With no previous experience in designing, building and operating a large-scale solar community system, these organizations underwent a steep learning curve, which began with a study tour of the major solar seasonal storage projects in Europe and culminated with a final design workshop to review and finalize the major design concepts for the Canadian project. Their enthusiasm, dedication and support throughout the design, construction, and performance monitoring periods enabled the Drake Landing project to achieve the success it has today, exceeding expectations and setting a new world record, 98% solar heating fraction in its sixth year of operation.

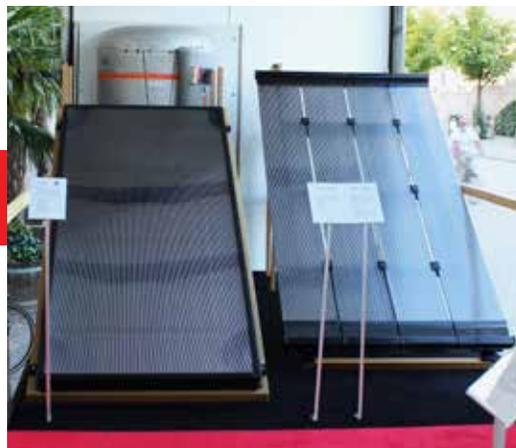
The heat for the homes in the Drake Landing Solar Community is generated from an array of 800 solar thermal collectors mounted on the garage roofs. The collectors generate a combined 1.5 megawatts of thermal power on a typical summer day. The heat is collected in a short-term storage and from there pumped into a borehole energy storage system comprised of 144 holes stretching to a depth of 37 metres and covering an area of 35 metres in diameter. By the end of summer, the earth of the seasonal storage reaches over 70°C. In winter, water is pumped through the pipes in the boreholes to collect the heat to be delivered to the homes.

The Drake Landing Company joins the list of other SHC Solar Award recipients – Fred Morse, Helmut Jäger, Manuel Collares Pereira, Volker Wittwer, Jan-Olof Dalenbäck, William Beckman, and Torben Esbensen. The SHC Programme is recognizing leaders in the field of solar energy not only for their contributions, but also to demonstrate that solar energy is a viable energy source for heating and cooling.

For more information on the Drake Landing Solar Community visit www.dlsc.ca.

echoed the call of this year’s SHC 2013 conference, which encouraged the visitors to find new ways to revive the potential of this important technology. Michael Köhl, Operating Agent of SHC Task 39 and one of the initiators of the exhibition agrees that the exhibition accomplished one of its goals, “The Task 39 Exhibition has had a great impact on the visitor’s acceptance of polymeric materials in solar systems. The exhibit demonstrated that there already exist some quite interesting and above all reliable and efficient products.”

This article was contributed by Sandrin Saile, Andreas Piekarczyk, Michael Köhl of Fraunhofer ISE, Germany. For more information visit the [SHC Task 39 webpage](#).



▲ **Figure 3. Polymeric solar collectors from the Israeli company Magen Ecoengery. Magen eco-FLARE® (left), Magen eco-SPARK® (right).**



◀ **Figure 4. Extruded thermosiphon system Therm-X. Design: EU SCOOP, built by: Fraunhofer ISE. (Photo: Fraunhofer ISE)**

Hundreds of Solar Thermal Experts Converged on the City of Freiburg

SHC 2013 Conference



SHC 2013, the 2nd International Conference on Solar Heating and Cooling for Buildings and

Industry, was held in Freiburg, Germany this past September. For three days, 400 experts from 36 countries discussed technological developments, markets and political framework conditions. The 15 keynotes, 90 oral presentations, and 140 posters provided a diverse forum for participants to learn about and share the state-of-the-art in solar thermal.

This time, as the conference moved from North America to Europe, the SHC Programme teamed up with the European Solar Thermal Industry Federation (ESTIF). Together they hosted the conference, bringing together researchers, industry and other important stakeholders in our sector. And while the majority of sessions focused on technological topics, several sessions specifically addressed industry topics, such as market developments in different countries and regions, analysis of existing public support mechanisms, and policies aimed at increasing the share of net zero energy buildings.

IEA SHC chairman, Werner Weiss, presented an overall positive view on the state of the worldwide solar thermal market highlighting the growth of 14% in 2012. "On a world-wide scale, we are on track to our goal of providing half of the low-temperature heat demand with solar thermal energy," said Weiss.

But this conference also showed that there is still an intensive need for R&D and knowledge dissemination if the market is to grow to significantly – especially in Europe, which is having a challenging time at the moment. With many of Europe's traditional solar thermal markets slowing down or stagnating in recent years, cost competitiveness of solar thermal with fossil fuel and renewable energy solutions with energy efficiency measures were recurring topics throughout the conference. Europe's goal to make Nearly Zero Energy Buildings the building standard by 2021 could provide the needed impetus to make solar thermal a standard building solution in Europe.

In addition to all the official conference sessions, SHC 2013 proved to be a fantastic networking event. The Freiburg Konzerthaus, with its bright and open architecture and its many niches and tables, provided excellent opportunities to meet and discuss. Throughout the conference people could be seen standing in small and large groups talking to each other. And the conference dinner was no different, instead of a formal event the organiser chose to host a walking dinner in Freiburg's famous Market Hall. The evening kicked off with the SHC Solar Award being presented to two representatives of Canada's Drake Solar Landing Company (see page 1 for special article).

The second SHC conference was a big success for everyone attending. For those who missed it – the conference papers will be published in Elsevier's Procedia series!



Join us at SHC 2014 in Beijing, China!

This year's conference is being held in one of the most dynamic, and by far the largest solar thermal market in the world. As the conference organizer, PSE's CEO Andreas Häberle notes, "Many people associate China with very simple, low-cost solar water heaters. But the country is an engine for new developments and they are making big strides in applications, such as solar process heat and solar cooling.