No shortage of ideas

At the Solarexpo in Verona, the Italian solar heating branch presented many new thermal products. But, despite all, the market is also slowing down in 2010.

They came in crowds to the Solarexpo in Verona held at the start of May. Many people stopped at the Sunerg Solar s.r.l. stand only to focus on one side of the exhibit, namely, the right side where the PV modules were displayed. Most of the visitors pretty much ignored the sun collectors despite the fact that Sunerg is one of the pioneers of collector production in Italy.

This scenario is symptomatic for the solar energy scene south of the Alps. Photovoltaics is booming, while solar heating is only slowly recovering from the crisis-induced slump of 2009. This is the unanimous mood of the market participants. As elsewhere as well, thermal energy is suffering from the fact that the public has underestimated the requirement of thermal energy compared to electrical power. The same thing happened with the output of the collectors.

Multivalent systems

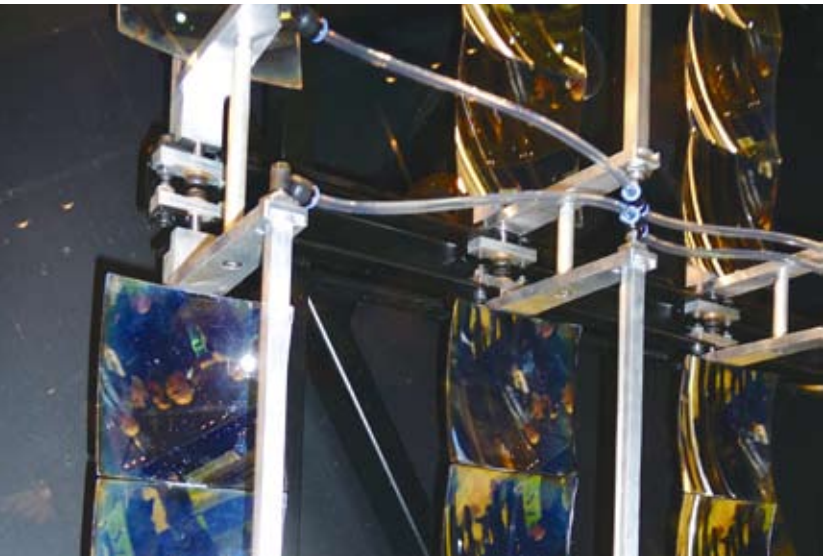
A walk around the exhibition halls also shows that Italy has an innovative solar heating branch. There is no shortage of new product ideas. Many companies presented multivalent systems, which combine solar heating with other heating sources in a compact heater. The KSU 150 of Kloben – the brand of the Turco Group s.r.l. – is able to store 150 litres. The device also has a condensing gas boiler, which integrates the solar station, expansion tanks and the entire hydraulic system for the heating circuits. The KSU 150 is a space saver. It is used when building new apartments in multi-family homes where there is little space for the heater. Kloben has models with 25 or 35 kW condensing boilers. The basic model only heats while expanded models also heat drinking water. For both models a Sky CPC vacuum tube collector delivers solar heat. Kloben is currently working on an improved model, Sky pro, which should be launched in 2010.

Cosmogas s.r.l. calls its device Solardens. It contains a buffer tank that holds 200 litres and, like the one of Kloben, is very slim and enables good thermal stratification. The solar heat exchanger is in the lower part of the buffer and is made from stainless steel. Up above is a copper tube heat exchanger which warms drinking water. Cosmogas manufactures models with 14, 26 or 35 kW condensing gas boilers. Up to three heating circuits with radiators or floor heating can be connected to the device. Alternatively, the customer can also opt for a device with an air-to-water heat pump.

In PT solar condensing, Biasi S.p.A. does without additional heating by the gas boiler. The 170 litre buffer tank is powered by solar energy. If there is not enough solar energy to be used for the hearting circuits or warm drinking water, the gas condensing boiler serves as an additional heater. To heat drinking water, a plate heat exchanger is integrated into the device. In addition to the 25 W gas condensing boiler, a 3 kW air-to-water heat pump is integrated into

PV modules and collectors in the same format make for an eye-appealing system which produces both power and heat.

Photos (3): Jens-Peter Meyer



Heat and power: Beghelli developed a hybrid concentrator PV module.

the Biasi Energetic Tower (B.E.T.). The storage volume of the stratified storage tank is 400 litres.

In its Mini Solar System, Costruzioni Solari s.r.l. combines both storage and hydraulic modules in one box. The fitter still has to add the gas boiler. But in the Clima Solar System, everything is in one box. A tank-in-tank combined storage system is the centre of the central heating, which is equipped with a 2.5 kW air-to-water heat pump. The size of the tank varies from 660 to 1,450 litres. A typical system for a home with 120 m² in energy efficiency class B with a thermal energy requirement of 40 kWh/(m²a) is comprised of the model with a 660 litre tank, four Panda collectors and an optional 1 kW PV system. So, 60 % of the heat requirements come from solar heat and the rest from the heat pump, which in summer can also be cooled via the floor heating. Solecho s.r.l. also uses geothermal energy with its Geosolbox. The compact system is equipped with a sole water heat pump.

Heat and energy from the sun

For the new Panda collector, Costruzioni Solari uses a novel back wall insulation made from an aerogel. Nano particles provide particularly low thermal conductivity of merely 0.012 W/m²K). This allows a flat collector structure with a thickness measuring only 4.5 cm. The Panda ought to pave the way for particularly aesthetic systems and new integration options in the building shells. What is more, the flat structure corresponds to the thickness of a PV module which facilitates the construction of hybrid systems made from PV modules and sun collectors.

With its SunHybrid, Sunerg offers such a system of PV modules and collectors. In addition, Sunerg has accommodated a polycrystalline 275W module in a standard collector frame. The company offers various packages with electrical outputs of 1.1 to 2.75 kW and a thermal output of 0.7 to 7 kW.

Another way to obtain both energy and warmth is through hybrid collectors. Anaf Solar, a division of Anaf S.p.A, manufactures PV modules that are connected on the back with an aluminium roll bond heat exchanger (see S&WE 5/2010, page 70). A mixture of water and glycol flows through the module and cools it. Another advantage is that in winter the fluid prevents the module from cooling down to below freezing. Snow does not last long. At a pilot plant near Milan, the output of the module increased through the cooling in summer by 30 % and on an annual average by still 15 %.

Because the module has to stay as cool as possible, heat arises at a low level. One way of using this heat is to use it as a heat source for the heat pump. Beghelli S.p.A. launched such a system.

In roughly a year, another system from Beghelli will be launched. The Modulo Energetico is set to become the core of an autonomous energy and heat supply: A concentrator PV module, where small parabolic reflectors concentrate the sunlight on multi-junction cells. And, here again, a coolant will make sure the output of the cells is not hampered. The cell heat production should be enough to heat the coolant up to 80 °C, enough to warm up drinking water or to heat with it. And, once again, a heat pump will bring about the necessary temperature boost should the sun not be shining enough.

The prototype, which Beghelli introduced in Verona, has a surface of 4.8 m². Its electrical output is 0.3 kW, its thermal one is 0.6 kW. With new modules in Rome, the user of a house having 120 m² can completely meet the needs for power and heat.

A temperature of 80 °C is enough to run a refrigeration machine and to cool in summer. Beghelli also wants to develop such systems. In contrast, the vacuum tube specialist Thermics s.r.l. uses enhancing heat pipe vacuum pipe collectors to run the refrigeration machines. In future, the company is going to work closely with the manufacturer for absorption refrigeration machines, ClimateWell.

There were all sorts of new things to see in Verona. We are going to focus on more innovations in the next issue of SUN & WIND ENERGY.

Jens-Peter Meyer

Further information:
Anaf S.p.A: www.anafsolar.eu
Beghelli S.p.A.: www.beghelli.com
Biasi S.p.A.: www.biasi.it
Cosmogas s.r.l.: www.cosmogas.com
Costruzioni Solari s.r.l.: www.costruzionisolari.it
Kloben (Turco Group s.r.l.): www.kloben.it
Solecho s.r.l.: www.solecho.it
Sunerg Solar s.r.l.: www.sunerg.it
Thermics s.r.l.: www.thermics.it

Quick installation: Compact condensing solar heaters are in demand – such as this one from Cosmogas.