

SolarMax

The Customer Magazine of Sputnik Engineering AG

Globe



SolarMax MT2 / MaxMonitoring

SolarMax MT2 – perfectly suited for large plants
MaxMonitoring – the plant monitoring app

Green Corner

News, curiosities, and interesting facts from
the renewable energy world

SolarMax in China

The solar market in China and tips for a visit
to Shanghai

Expert Discussion - Solar Market Forecast

Prof. Dr. V. Quaschnig gives his opinion on
the development of the photovoltaic market

Green light for Elsterheide project

Gräss Solartechnik GmbH & Co. KG installs
SolarMax inverters at Elsterheide solar park

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Editorial



Let's take a quick look back at the years 2009 and 2010: there was much fanfare in the press regarding the phenomenal growth of the solar market. And in 2011: "Dark clouds form over the solar market", "Solar receptors are in the shade", and "Total solar eclipse" – reading the headlines last year could darken even the sunniest minds. What is our industry now facing? Where are the rays of hope on the horizon?

The experts agreed on the fact that 2012 is certainly not going to be an easy year. From 2013, or 2014 at the latest, we will, however, see another ray of hope because from then the European markets will probably have recovered. However forecasts can be difficult: things can turn out completely differently to how they are predicted. As a result of our 20 years of experience in the photovoltaic industry we have learned that this emergent energy generation industry is very volatile and and it is thus very difficult to predict.

However, we are confident that the solar industry as a whole has excellent opportunities and will grow again in the near future. In addition, many markets outside of Europe are developing very positively. Therefore, we are also continuously expanding into new markets and, thanks to our Swiss quality products, we are very well positioned abroad. Last year, for example, we successfully started selling our products in China and since February 2012 we also have local branches in Greece and Bulgaria. We will introduce our products into even more markets in the coming months and years. From a global perspective, the potential in the photovoltaic industry is immense - we are only right at the beginning of this.

I wish you a very happy and successful 2012 and hope that you enjoy our new SolarMax Globe.

A handwritten signature in black ink that reads 'Ch. von Bergen'.

Christoph von Bergen
Managing Director of Sputnik Engineering AG

SolarMax MT2 – perfectly suited for large plants

From April 2012, the new SolarMax MT2 string inverters – 10MT2, 13MT2, and 15MT2 – will be available. With these, SolarMax is expanding the successful MT series by three more inverters in the 10-15kW output range, which are suitable both for plants over 10kW output and especially for decentralised large-scale systems.

The SolarMax MT series is renowned for its reliable Swiss quality as well as high efficiency and flexibility, even for difficult roofs and under differing irradiation conditions. The new MT2 inverters consequently extend this successful series and also offer an improved price-performance ratio. With efficiencies of up to 98% they maximise – like all MT devices – the yields of any facility. They are equipped with two asymmetrically loadable MPP trackers and, thanks to there being a maximum of two string connections per tracker, a string back-up is not necessary.

The three-phase MT2 string inverters are particularly suitable for photovoltaic systems with homogeneous solar generators. This is applicable, in particular, to decentralised commercial, industrial, and agricultural large-scale systems. However, the MT2 inverters can also be used in smaller facilities with modules which are partially in the shade or roofs which face both East and West. Thanks to a targeted division of the solar generator, power losses, which may arise as a result of shadows, are minimised. With a higher input of 18A per tracker, the MT2 inverters



1 | Photovoltaic plant at the EPFL university campus in Lausanne – the largest solar power plant in Switzerland with 42 SolarMax MT inverters

partner especially well with high efficiency modules with high string currents and, with a weight of just 39kg per inverter, the MT2 devices can be installed very quickly and easily.

In order to also differentiate the devices in terms of their name, the previous models 13MT and 15MT are renamed and will be sold under the names 13MT3 and 15MT3 from April 2012. In the future, the former SolarMax 10MT will have an input current of 18A and will be continued under the name 10MT2. Thus, from April, five indi-

vidually usable MT string inverters will be available: 10MT2, 13MT2, and 15MT2 (two trackers), as well as 13MT3 and 15MT3 (three trackers).

It goes without saying that all MT inverters comply with legal provisions and standards, and can be used in a variety of countries, both within and outside of Europe. ■

Expert Discussion - Solar Market Forecast with a focus on Germany

Interview with Prof. Dr. Quaschnig, German expert in the field of renewable energies



How do you see the general market development in the photovoltaic industry?

The globally installed photovoltaic output has had many years of growth, the percentage of which has been in the high teens. When expanding their production capacities, many companies focused on sustained high growth. Therefore, there are currently excess capacities which are pushing prices down greatly. We are currently experiencing a consolidation phase with low growth rates in which a market adjustment is due. Only a small number of companies will survive this unchanged. However, as a result of falling prices photovoltaics will become more interesting for a quickly growing customer group on a global basis, so that the growth will rise significantly soon. If we also want to actively counteract climate change then we need an annual installation volume of photovoltaic systems in the scale of 500GW. If we now look at the currently manageable 20GW in Germany today, then there is still a great deal of scope for improvement.

In your opinion, which changes to the PV landscape are to be expected upon reaching “grid parity” in Germany?

“Grid parity” for systems in private households has been, theoretically, already achieved in Germany since the start of 2012; however, this is only applicable if all the solar power is used by the households themselves. This does not happen in private households. The prerequisites are much better in industry. As energy prices are much lower here, however, “grid parity” will only be achieved in a few years. With further falling prices for photovoltaic systems and the use of storage systems, private households will also, in the foreseeable future, be able to efficiently operate photovoltaic systems without increased compensation for energy fed into the grid provided for by the German Renewable Energies Act (EEG). This could happen in three to six years. However, for this we require completely revised facility designs, which are optimised for personal consumption. That will completely turn the PV landscape on its head once again. Providers with innovative products and concepts will then enjoy a very positive market environment.

How do you see the cost development in this?

The photovoltaic learning curve has been stable since the 1970ies: every time the globally installed output doubles the costs decrease by 20 percent. In 2011, the prices, first and

1 | Prof. Dr.-Ing. habil. Volker Quaschnig lectures in regenerative energy systems at the HTW University of Applied Sciences in Berlin



2 | Presentation at the Forum for Energy and Environment at the HTW Berlin

foremost for modules, decreased faster than the installed output grew. Therefore, after the consolidation phase the price decrease will actually be lower. There is no obstacle that the costs won't fall further along the learning curve in the long-term. In the foreseeable future, photovoltaic plants will be able to operate efficiently for payment of less than 10 Euro cents per kWh.

Conflict in politics: energy turnaround enacted, phase-out of nuclear energy has been decided, but now the german solar energy expansion should be capped - what are the alternatives?

Policy has dictated that at least 35 percent of energy should originate from regenerative power plants by 2020 in Germany. 50 percent would be required for effective climate protection. Even the government itself doesn't seem to know how the poor 35 percent aim should be achieved given a strong decrease in the expansion of photovoltaics. It is also more than unlikely that the expansion of offshore wind energy will be sufficient. It is also possible that people are assuming that the objectives will not be met. If this is the case then it is possible that in 10 years the phase-out of nuclear energy must be reconsidered and the framework conditions for rebuilding or the continued operation of coal power stations would be improved significantly. At least until the next parliamentary elections for the German Bundestag, the expectations for photovoltaics in Germany are that it will probably worsen rather than improve. These energy transition setbacks are, however, a catastrophe for climate protection. If we are not able to establish an almost carbon dioxide free energy generation in the next 30 years then we will sink our coastal regions into the sea in the long-term. In my opinion, the only alternative to a quick solar and wind energy expansion are dyke building measures.

What is your opinion of the German Renewable Energies Act (EEG) and the Low-Voltage Directive in Germany? Do you think the changes are useful?

The integration of the strongly increased photovoltaic share in the grid presents a great challenge, to which the appropriate directives and laws must be responsive. One example of this is the 50.2Hz problem. According to the old rules, in the event of grid failures, all photovoltaic systems would disconnect from the grid at 50.2Hz and would, thus, have caused problems, possibly leading to a Europe-wide blackout. Despite warnings from the solar industry, the 50,2Hz problem was completely neglected, was improved under serious time pressure, and now has to deal with extremely high follow-up costs. In this respect it is generally sensible that laws and directives adopt attempts at solutions leading to better grid integration.

Are there new fields which are gaining relevance?

If photovoltaics are to reach their full competitive position then it will be necessary to come up with ways in which the costs can be reduced by another 50% in the near future. The inverter and assembly fields will become more relevant. The focus in future will increasingly be on personal consumption systems. The aim here is to develop intelligent systems and accumulators. It is highly probable that in just a few years we will see the first photovoltaic facilities for heating water and supporting central heating systems. In the very foreseeable future, such concepts will also become economically attractive. The photovoltaic industry will soon achieve its full economic competitive position. If this is achieved, then very dynamic market growth is imminent. ■

Maximum Overview with MaxMonitoring

The free SolarMax app displays the performance data of PV systems in real-time. With this app, plant operators can view their photovoltaic systems' performance data at any time, either at home or on their smartphones or tablet computers when they are out and about.



MaxMonitoring is available for the iPhone and iPad as well as soon for Android smartphones and can be downloaded for free in the respective app stores. Simply search for MaxMonitoring!

The application can manage data from 15 systems in total, each with up to ten SolarMax inverters. Performance data is displayed in a clear way and is divided into different areas so that the most important information is available to the user at a glance.

The real-time display shows data from up to four different inverters at the same time, for example input and output voltages, input and output currents, frequency, device temperature, and yield. The status display indicates whether all inverters are working correctly or whether there is any failure. Therefore, plant operators are able to recognize technical problems at an early

stage and commission technicians to correct these. In addition, the app also shows data curves for daily, monthly, and annual yield.

Since all SolarMax inverters can be connected to a Wi-Fi router using the standard Ethernet interface, MaxMonitoring can directly access system data within the domestic network, without needing to be connected to the internet. ■



You can see at any time how much environmentally friendly solar energy your system is generating

Green light for Elsterheide project



1 |

Biggest PV plant for SolarMax – Gräss Solartechnik GmbH & Co. KG installs SolarMax inverters in Elsterheide solar park.

The small town of Hoyerswerda, situated in the district of Bautzen with a population of around 38,000, is a quiet place. The main features of the town have always been the awareness of tradition and the Lausitz linseed oil. Now the peaceful town of Hoyerswerda in the Free State of Saxony has been given an added attraction: the Elsterheide solar park.

The modern open air PV plant with an outstanding overall output of 20MW

extends over 45 hectares. A total of 86,960 modules made by Sunowe have been installed. Spread over 18 power stations, there is a total of 54 SolarMax 330TS-SV central inverters, each with a rated output of 330kW. Solar energy from Hoyerswerda has been fed into the German national grid since January 2012.

Gräss Solartechnik GmbH & Co. KG has been specialising in the assembly of open-area PV plants for many years

now. And for projects of this size, Gräss has already drawn upon the expertise of SolarMax on a number of occasions. Both companies are in agreement that quality, reliability and precise cooperation are the key to a project such as this. Similar values and corporate cultures form the basis for efficient project cooperation.

A particular challenge with the Elsterheide solar park for both companies was the extremely short execution time: There were only ten days between the signing of the contracts and the start of the project. All parts had been supplied within a period of only four weeks. "This kind of success under such time pressure is only possible with the help of



- 1 | Elsterheide Solarpark with an overall output of 20 MW
- 2 | The largest project in the world carried out using SolarMax inverters
- 3 | Spread over 18 power stations, there is a total of 54 SolarMax 330TS-SV central inverters

2 |

3 |

reliable partners. Here, the Swiss inverter manufacturer SolarMax has really proven its flexibility and speed," explains Managing Director Harald Gräss.

The fact that the quality remained the same despite the hurried nature of the project can be clearly seen from the clever monitoring of the PV plant. Via the MaxComm communication platform, the entire plant can be monitored right down to each individual string. This can either be carried out by the plant operators themselves or be left to SolarMax. This means that perfect operation is guaranteed at the solar park for decades. ■

Plant data Elsterheide

Output / area	20.004.4 kWp / 450,000 m ²
Modules	mono-crystalline modules from Sunowe: 225 Wp modules - 26,720 modules (6.012 MWp) 230 Wp modules - 32,800 modules (7.544 MWp) 235 Wp modules - 27,440 modules (6.4484 MWp)
Inverters	18 string inverter stations, each with 3 SolarMax 330TS-SV inverters
Inclination and orientation	25° South
Expected annual yield	19,464,000 kWh
Acceptance	23.12.2011
Grid connection	23.12.2011



SolarMax in China

Far away from the crisis-ridden EU nations, there is a country that, in 2011, became the world's second-largest economy. It is larger than Australia and is a multinational state with the largest population in the world.

Zhongguo, which in Chinese means “middle kingdom”, is a place of extremes. From the climate, the geography, the history or the economy. With regular news about the superpower in the fast lane, it is difficult to image China still being an emerging nation. The development of the People's Republic can be described well by the Chinese proverb “yugong yi shan”, “where there's a will, there's a way”. And China has been following this way since the 1980s when it opened its market to foreign investors.

But the economic growth comes at a price. China's energy demand is increasing so quickly that it can barely be met. Even though China is currently using almost all available energy resources, the country is still reliant on energy imports. China is now not only the world's leading energy consumer, but also causes the highest CO2 emissions. However, the country is aware of the growing importance of the protection of the environment. In the new five-year plan, increased financing for renewable energy plays an important role.

In 2010, the World Expo was held in the service centre of Shanghai. The city served as a test laboratory for innovative solutions with electric cars, rubbish separa-

tion and renewable energy. Shanghai is one of the world's ten largest cities, even ahead of Beijing. Thanks to the urbanisation there, China's large cities require more-sustainable urban planning and greater energy efficiency.

Georg Geng, General Manager of SolarMax China, also knows the exceptional situation of the solar market in China: “In 2011, almost 2 gigawatts of solar energy was installed and another 4 gigawatts are expected in 2012. Around 70% of the solar power capacity that has been installed is part of large-scale projects within the framework of the State's Golden Sun Program or other large-scale facilities in western China.”

George Geng sees a challenge for many service providers in the solar market. Thanks to the explosive increase in demand over the past few years, we are now seeing surplus supply. The market consolidation predicted by experts in 2011 has already taken hold and George Geng is sure that quality products and a good reputation will play an essential role in beating off the competition: “The standards of quality in China have increased. Certification is one of the top criteria for product selection and some testing re-

quirements are even stricter than European requirements. Solar projects often have to pass the so-called LVRT (Low Voltage Ride Through) tests carried out by the State Grid laboratory in order to receive approval for connection to the State's national grid.”

Although the price is often the first question when it comes to purchasing components, solar project companies' and fitters' awareness of quality is growing - and it can often be an advantage for a service provider to come from Europe. “European and Swiss products have a very good reputation here. It's not just the manufacturing facilities in the solar industry that come from Germany, Italy or Switzerland, many traditional products, such as high-quality Swiss watches, are highly prized for their reliability in China and contribute to greater acceptance.”

Although SolarMax only began marketing its products in China in July 2011, the Chinese SolarMax team has already been able to acquire many customers. According to George Geng, demand is particularly high for inverter series which are well-suited to large-scale projects. The SolarMax central inverters 50TS, 80TS and 100TS have already been certified for the Golden Sun Program, and certification is due for other inverters too. The fact that SolarMax has been so well received in China was also able to be seen at the Inter-solar Beijing trade fair in December 2011, where the Swiss inverter specialists' booth was one of the best visited booths of the whole fair. ■

Chinas Energy in Numbers

China consumes one fifth of the world energy ¹. The electricity demand increased in 2010 by 11.2% to 4,190 billion kWh. Electricity consumption of 8,200 terawatt hours is predicted in 2020. This is double consumption in 2010.

Over 26% of this power was generated from non-fossil fuel sources:

Hydro-electric - 22.18%
or 213.4 million kW

Wind energy - 3.23%
or 31.07 million kW

Nuclear energy - 1.12%
or 10.82 million kW

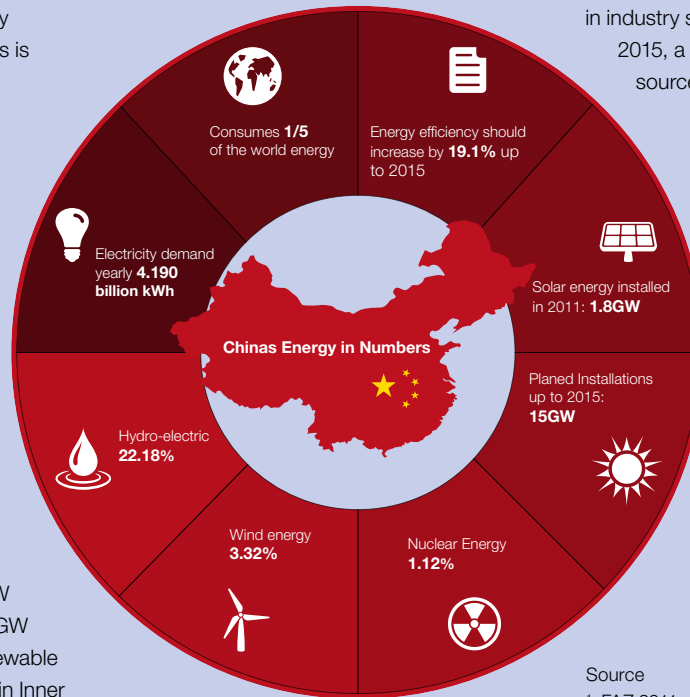
A total of ten percent of Chinese energy is imported ².

Solar Energy Statistics

Solar energy installed in 2011: 1.8GW
Planned installations up to 2015: 15GW
Mega projects such as a 12GW renewable energy park with 2GW solar energy in Inner Mongolia (Ordos) is planned for 2019 and a solar farm with 1GW in Datong City.

Five-year plan from 2011 to 2015

The plan envisages a 7% reduction in economic growth per year. Energy efficiency in industry should increase by 19.1%. For 2015, a proportion of non-fuel energy sources of 11.4% of primary energy consumption is planned. Nuclear energy is also included here ³.



Source

¹ FAZ 2011

² China Electricity Council, 01/2011

³ BMU, Climate Talk expert dialogue, 03/2011

As reliable as a Swiss clock



George Geng, General Manager
Sputnik Engineering Trading Ltd.

Mr Geng, what do Chinese people associate with Switzerland - are there any clichés?

Alongside tasty chocolate, in China we associate Switzerland with Swiss pocket watches and clocks. That's why Swiss products stand for quality and precision. Furthermore, the Swiss people are seen to be very reliable and punctual.

What are the greatest cultural differences you see in your day-to-day business life?

Swiss culture and the Swiss people are extremely direct. Clear statements are made and conversations are very pro-

cess-oriented. Chinese culture and communication is more indirect and personal relationships, and maintaining these relationships, are essential for business.

Do you have any personal tips about what SolarMax visitors absolutely must see in Shanghai?

You should definitely take time to experience the city. There are many traditional and modern aspects to the districts Shanghai Puxi & Pudong. One particular recommendation would be "The Bund" the famous port district where architecture from a wide range of styles are combined.

Personally, I would also recommend the "Yuyuan Garden", a famous classic garden from the Ming Dynasty in Anren Road, which is an oasis of calm after a stressful day of business. Food with a view is offered by the restaurant in the Oriental Pearl TV Tower in Pudong Park in Lujiazui. The restaurant revolves and provides outstanding views over the city. ■



Get to know...

André Lüthi from Technical Sales Support

In our new series “Get to know...”, we introduce one of our employees and his/her role within SolarMax. André Lüthi manages the Technical Sales Support department (Pre Sales).

How did you become the manager of the Technical Sales Support department with an inverter manufacturer?

I admittedly am an engineer by trade but I realised very quickly that what I enjoyed most was advising customers and helping them to find the best solutions for the selected fields of application and projects. That is one of the duties carried out by an employee in the Technical Sales Support department.

Since completing my degree and graduating as an electrician and then doing further training in management, I have now been responsible for different projects from the fields of system integration and network connection for the electricity and telecommunication infrastructure as a project manager and team leader.

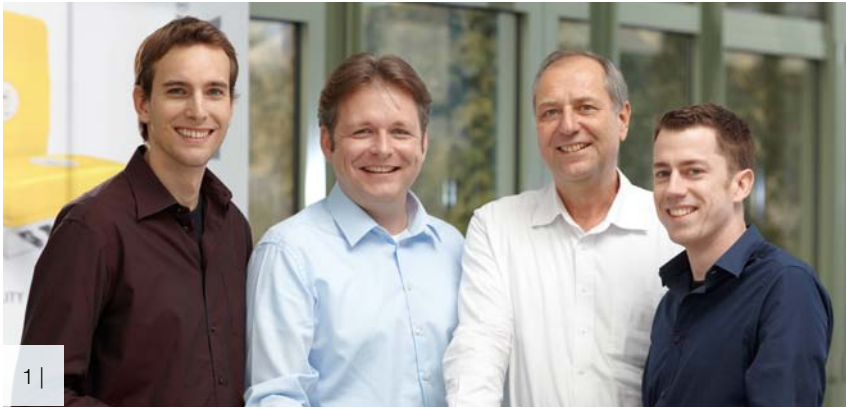
I have been enthusiastic about “renewable energies” for a long time. When I started at SolarMax in 2010 I knew I had found a company that lived out the val-

ues and standards which are also important to me.

Which values are important to you and to SolarMax?

Along with the provision of quality products and services, an important value is to really want to understand the customer and not to “coerce him into buying something he doesn’t need/want”. It is very important to us that a customer starts off into his project safe in the knowledge that he was provided with honest advice and that he found the solution which is technically and economically best for him.

We receive confirmation that we are on the right track with this concept from our longstanding partners. They value our



1 | Technical Sales Support team:
Dominik Amrein, André Lüthi, Werner
Gloor und René Obrist

advice, which they continue to seek when undertaking new projects.

In your opinion, does the Technical Sales Support department at SolarMax differ from that of other providers?

Our advisory focus is very distinctive. We support our customers in the planning phase and make our very diverse technical experience from the countless projects we have been involved in available to them.

The advice we provide customers with is not just with regards to finding a solution, we also check the technical practicability of the projects and validate corresponding solution concepts. This also includes showing, truthfully, what the limits of current technology are. We do not want to realise projects which are not useful or profitable just for the sake of profit. Project risks, which will limit the customer operationally or negatively affect the profitability of the facility are highlighted to the customer and alternatives are developed. Thus the customer is always involved in the development process.

Do you have any examples of this?

The inverter a customer targets is not always the one which is the most suitable for him. In this case we are able to offer alternative variants. For example, a divided system with which shadows can be compensated for in a more flexible way. We also advise in the field of system stringing in order to achieve an optimal utilisation.

We also provide our customers with project-related training on a technical level so

that they are able to utilise the SolarMax products properly. In doing so, we guarantee the quality of the facility in the interaction between modules and inverters and minimise project risks. We are, of course, also contact persons for the customers regarding any other technical questions arising in the course of a project.

But this exceeds the scope of responsibility of Technical Sales Support, doesn't it?

Yes, but my team has a close working relationship with our After Sales department and in this respect too, customer care is the top priority. Together with our colleagues in After Sales, we support all project phases: from the planning to the implementation up to the conclusion of the project. We guarantee that the project goes live properly and are also contact persons for the whole life cycle of the facility. It's effectively an "all-round service".

Are there local differences in terms of project planning?

Oh yes, definitely. I think that something that is important here is whether a supplier has experience with projects in different regions. If a customer has realised a project in England and is now operating in Spain then his experiences cannot be transferred 1:1. With our international team and projects in a variety of locations, we are able to contribute our local experience and also provide advice on-site. However, it is not just good advice that is a prerequisite for globally successful projects, but also good products. With the Swiss quality inverters,

SolarMax has already made a name for itself internationally. ■

Profile

Name:
André Lüthi

Date of Birth:
06.03.1968

Occupation:
Head of Technical Sales Support at SolarMax

Qualifications:
Degree (Diplom) as an electrician

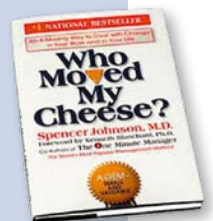
Favourite food:
veal liver with Rösti
(fried grated potatoes)

Favourite book:
Who Moved My Cheese?

Motto (in life):
Walk the talk, talk the walk!

Favourite place:
A place in the sun on our local mountain - the Gurten - with a view of the Eiger, the Mönch and the Jungfrauoch (mountains).

Family:
We cannot change our ancestors but we can have a say in what will become of our descendants.
(François de La Rochefoucauld)



Finds

News, curiosities, and interesting facts from the renewable energy world

Sunshine reggae

More and more manufacturers are using solar power for everyday appliances. The portable radio appliance "solarDAB" can, for example, be operated with solar power and the three integrated rechargeable AA batteries ensure socket- and emission-free radio enjoyment. When the batteries are fully charged the appliance should operate for 20 hours. It also receives the most current transmission standard DAB+ as well as VHF channels. ■

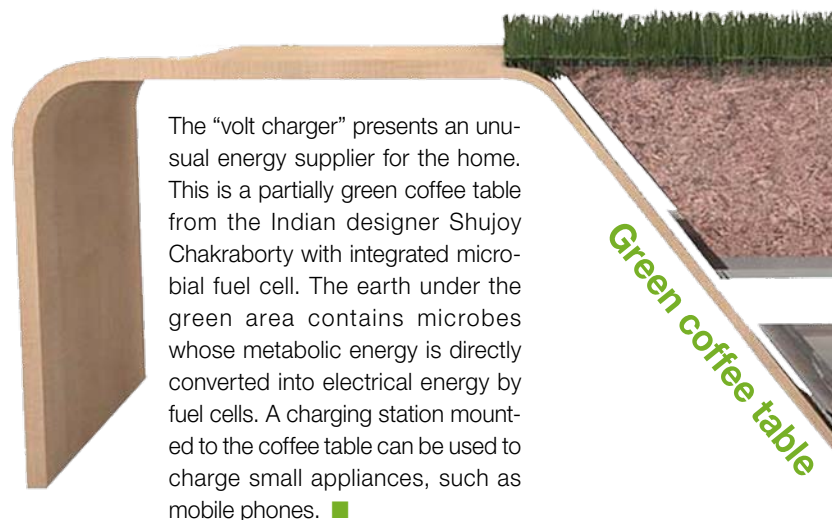


Water World

Over 70% of the earth's surface is covered in water. An Israeli company has set itself the aim of using this potential for photovoltaics. By means of silicone cells floating on the surface of waters and being cooled by this immense surface area can be used for solar energy generation. An individual solar module has, according to the manufacturer, an output of up to 0.5 Kilowatts and can be combined arbitrarily with other modules. The panels can, theoretically, be manufactured in any shape and size desired meaning they are exceptionally flexible in application. ■

Öko-Disco recycles energy from dancing

The Dutch people can show us how we can live in a sustainable and environmentally friendly way even in our free-time. In the world's first Öko-Disco "Club WATT" in Rotterdam the amount of energy saved annually is the amount that 40 families consume in the same period. Along with recyclable "eco cups" for drinks, LED lighting, and toilets using rain water when they flush, the dance floor is the highlight of the club. It consists of several modules sinking about a centimetre when people dance on them. There are special mechanics and a generator under these modules converting the kinetic energy produced by the vertical movement of the modules into electricity. For each "dance step" energy from at least two to 20 Watts can be generated, which is used for the club's energy supply. A system like this would also be profitable in the foyers of airports or train stations and anywhere else where there are lots of people. ■



The "volt charger" presents an unusual energy supplier for the home. This is a partially green coffee table from the Indian designer Shujoy Chakraborty with integrated microbial fuel cell. The earth under the green area contains microbes whose metabolic energy is directly converted into electrical energy by fuel cells. A charging station mounted to the coffee table can be used to charge small appliances, such as mobile phones. ■

Bear in mind

The polar bear – which has now been chosen as a symbol for climate change – shows us the way: the polar bear ingeniously uses the sunlight to keep warm. As soon as the sunlight hits the polar bear's skin it is conducted through the transparent fur, absorbed by the bear's black skin, and converted into heat. "Transparent insulation materials (TIM)" and "transparent thermal insulation (TTI)" use the same functional principle. The material consists of light conducting elements conducting rays of sunshine to a black absorbent layer. It is usually attached to the house facades so that the roof remains useable for solar power plants. As the effect of the light conducting ele-



ments is dependent on the position of the sun then it is guaranteed that heat is only generated in winter. The good insulation effect keeps buildings warm in the winter and cool in the summer. The technology is suitable for both new buildings and for energy-saving renovation measures. The professional association "Transparente Wärmedämmung e. V." provides multi-supplier advice on environmentally friendly insulation materials. ■



Roof potential

There are around 1,760 square kilometres of roof in Germany alone which could, theoretically, be used for solar power generation with photovoltaic systems. A German company rents free roof spaces from the owners and equips these with small solar power plants. The ambitious goal is to make hundreds of square kilometres usable for solar power generation and to encourage local authorities, property management firms, and companies to recognise the opportunities of photovoltaics. ■

Sun to go

Two graduates from the New York Columbia Graduate School of Architecture developed a unique solar light with a photovoltaic panel between inflatable plastic layers. The "LuminAID" light is suitable for both developing countries and disaster areas as well as for regular outdoor activities. After six hours in the sun, for example attached to a rucksack, the solar light is fully charged and then provides about five hours of light when it is dark. "LuminAID" is watertight and floats when it is inflated. ■



Energetically on the move

Who says "exercise kills"?! A new mini generator – hidden in the soles of shoes – generates enough energy while jogging that mobile phones, laptops, etc. can be charged via "easy going" in future. The core of the technology consists of numerous drops of a conducting liquid embedded between two layers. These layers consist of a specifically structured thin film certain areas of which are conductive. Thus, they serve as contact surfaces for the drops which move under

pressure and vibrations and correspondingly change their overlap with the contact surface. If these contact surfaces now is reduced, then parts of the electric voltage normally held between the drop and the layer flow over an electrical conductor. The suitable devices can now be operated with the energy generated this way. Around 1,000 drops of conductive liquid are required for a targeted yield of ten Watts. The more drops there are the higher the energy yield! ■



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by surface mail to: Sputnik Engineering AG, Höhweg 85, CH-2502 Biel/Bienne,

via e-mail to: pr@solarmax.com



Trade fair calendar 2012

Sputnik Engineering AG is presenting its products from March to December 2011 at the following trade fairs:

Event	Date	Location	Internet
27th Symposium on Photovoltaic Solar Energy	27. - 02.03.12	Bad Staffelstein, Germany	www.otti.de
Ecotec	15. - 18.03.12	Athens, Greece	www.ecotec.gr
Ecobuild	20. - 22.03.12	London, Great Britain	www.ecobuild.co.uk
SEE Solar Exhibition	28. - 30.03.12	Sofia, Bulgaria	www.eeandres.viaexpo.com
Salon des Energies Renouvelables	03. - 05.04.12	Paris, France	www.bepositive-events.com
SNEC	16. - 18.05.12	Shanghai, China	www.snec.org.cn
Solarexpo	09. - 11.05.12	Verona, Italy	www.solarexpo.com
Genera	23. - 25.05.12	Madrid, Spain	www.genera.ifema.es
Intersolar Europe	13. - 15.06.12	Munich, Germany	www.intersolar.de
PV Rome	05. - 07.09.12	Rome, Italy	www.zeroemissionrome.eu
Energaia	05. - 07.12.12	Montpellier, France	www.energaia-expo.com

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