Intersolar North America 2012 had hardly closed its doors when the organizers made the decision that 2013 would include a new segment: energy storage. The unusually strong interest shown by visitors to the fair in the special exhibit on energy storage that was offered for the first time in 2012 as a trial made clear that this was an area that would need to be accorded more space in the future. Visitors to the upcoming Intersolar North America can therefore look forward to a broad palette of exhibits of the newest storage technology, enriched with talks by experts and a solar energy storage blog.

Energy storage is not just needed in buildings; it is also required in electric vehicles. That is why this year there will be another special exhibit: E-Mobility. PV carports, charging points and electric vehicles will show how mobility can work without combustion engines.

New segment: energy storage

In the new exhibition area, located on level 2 at the Moscone West Hall, Intersolar North America will present the latest storage technologies for regenerative energy. The focus is on systems based on lead-acid and lithium-ion batteries to store electricity.

The US is one of the leaders in production and innovation of storage systems. This is due to the well-funded development support programmes, renowned research institutes and established battery makers as well as the battery manufacturing start-ups that grow out of the research institutes.

Industry analysts forecast that the global market for energy storage over the next 10 to 20 years could be upward of 300 GW in size and US$ 200 to 600 billion in value, and the US grid storage market could reach two to four GW by 2016. New policies like the California Energy Storage Bill AB 2514 will further stimulate the market in the near-term. “We are convinced that those who can offer solutions for the storage and intelligent distribution of solar power today will determine the technological and social developments of tomorrow”, says Markus Elsässer, Managing Director of Solar Promotion, the organizer of Intersolar.

“We know that the innovations in energy storage are particularly relevant to our visitors, who will rely on these technologies more and more as the solar industry grows”, he continues. “As such, we have
specifically reserved this segment for exhibitors providing storage solutions that range from battery storage via the combination of various storage systems to large energy storage solutions." Well-known producers such as S&C Electric Company, Princeton Power Systems and McCalmont Engineering will present their storage solutions at Intersolar North America.

**Solar energy storage blog**

To give the solar and energy industries a platform to discuss and exchange ideas, in April the organizers of Intersolar created the “Solar Energy Storage Blog”. On the website, researchers and other experts from the industry and associations explain current issues in efficient storage, own-consumption of solar power and grid integration.

The exhibition segment will be accompanied by the PV ENERGY WOLRD stage where experts, partners and exhibitors will give insights into new state-of-the-art technologies to interested media representatives, policy makers, visitors and exhibitors directly on the show floor. On Tuesday 9th July and Wednesday 10th July there will be a full-day programme. After introductory presentations by the scientific partners, Fraunhofer Institute for Solar Energy Systems (ISE) and Fraunhofer Center for Sustainable Energy Systems (CSE), the exhibitors will present their latest storage solutions and technologies.

Energy storage is not only being developed for static uses in buildings, but also for mobile applications in vehicles. The latter is growing in importance, especially in the US, where President Obama declared in 2009 that by 2015 one million electric vehicles should be driving on America’s roads. Mobile batteries are also a way of increasing own consumption of solar power. Because of the rising significance of this sector, Intersolar North America will present the special exhibit E-Mobility for the first time (booth 9635).

**Special exhibit E-Mobility**

The eMobility special exhibit made its debut at Intersolar Europe in 2012 and attracted an impressive number of new exhibitors and a steady stream of visitors. Numerous solar carports, EV charging stations and electric vehicles were on display. “We’re excited to bring an expanded E-Mobility exhibition to Intersolar North America as California is at the heart of the E-Mobility industry”, says Elsässer. “Many E-Mobility component suppliers and electric vehicle manufacturers call California home, and we’re pleased to showcase their innovations alongside many others at this year’s exhibition.”

E-Mobility couples two rapidly developing market sectors: electric vehicles and energy storage. “Therefore it is a natural fit for Intersolar North America”, says Elsässer. “We are bringing together these sectors in order to facilitate the exchange of ideas between the solar industry and E-Mobility companies and to allow attendees to see the innovations...”
In North America as well as in Europe, Intersolar will present new storage technologies for solar power.

firsthand.” The exhibit will showcase technologies designed to expand the clean mobility market and provide attendees with the information they need to develop new charging systems and solar carport solutions in order to take advantage of this emerging opportunity.

Electric and hybrid vehicles

When discussing E-Mobility, one often talks in general terms about electric cars. There are, however, four technologies that should be differentiated. Strictly speaking, only a car that is 100% powered by electricity should be called an electric vehicle. The Roadster Model X and the new Model S from the Californian car maker Tesla Motors, as well as the Nissan Leaf built by the Japanese manufacturer Nissan fall into this category. Some others are the BMW i3, the Coda from battery and car manufacturer Coda, based in Los Angeles, the Mitsubishi i-MiEV and the Ford Focus Electric.

Then there are electrically driven vehicles with a range extender. This is a system that extends the distance a car can travel. It is usually a combustion engine. Chevrolet’s Volt is one example. The third category is the so-called plug-in hybrids. These cars, like Toyota’s Prius Plug-in Hybrid, can be plugged into a socket. The fourth group consists of hybrid cars that cannot be plugged in, like the Toyota Prius.

“At Intersolar we are concentrating on the purely electric cars”, says Elsässer. “Electric vehicles play an important role in the future energy supply, thanks to their batteries storing electricity which can be used to stabilize the grid.” Intelligent control technology charges the batteries when sufficient cheap power is available. At peak times, when electricity demand is high among grid users, the stored power can be used as a short-term backup. As private vehicles spend 90% of their time parked and not in use, this opens up enormous potential to compensate for peaks in demand.

These intelligent systems are the most effective and sustainable when the vehicles are “filled up” with solar power from, for example, the energy produced by the user’s own roof-mounted PV installation or carport. In addition to protecting cars from rain and snow, PV carports are also able to deliver the energy needed for e-vehicles. Some of the solar power is used to charge the vehicle battery, while the rest is consumed for a different purpose or fed into the grid.

Special charging stations for PV carports synchronize the charging times of the electric vehicles with electricity generated by the photovoltaic installation. An installation with a capacity of three kW can supply enough power for a vehicle to travel around 15,000 km per year. “The combination makes sense because electric vehicles have significantly greater levels of efficiency than vehicles with combustion engines, and generating power directly from renewable sources is much more efficient than producing biofuel, for example”, explains Markus Elsässer.

Among others, Sunora Energy Solutions, Solaire Generation and Shoals Technologies Group will be the first to present their complete integrated systems, showcasing the latest E-Mobility solutions on the show floor at Intersolar North America. “We are also including various electric vehicle manufacturers in the exhibit, which will give attendees the opportunity to take a closer look at the vehicles driving mainstream EV adoption”, says the Intersolar boss.

The Obama administration has introduced diverse support measures aimed at pushing forward the E-Mobility market. The Department of Energy (DOE) has created the Advanced Technology Vehicles
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Manufacturing Loan Program (ATVM). With a total volume of US$ 25 billion, this fund provides loans to car manufacturers and their suppliers to develop high-tech cars and adapt their production plants in the US.

Another measure is the creation of a US$ 2.4 billion fund to support next-generation plug-in vehicles and their advanced battery components. Among other things, the fund finances tax credits of up to US$ 7,500 for the purchase of a plug-in hybrid car. Hybrid cars are currently the most common type of electric vehicle in the US.

**California forges ahead**

Besides the necessary legislation and financial support measures, a good charging infrastructure is a precondition for the continued spread of electric vehicles. California is setting an example in this regard. It is the first US state to set up an agency to regulate CO₂ emissions and air pollution from cars. The California Air Resources Board (CARB) prescribes how many electric vehicles must exist in each municipality in order to stay within the permissible emission levels.

Furthermore, the California Energy Commission is providing US$ 100 million per year until 2014 to support the development of electric vehicles and more efficient batteries and to finance the development of the required infrastructure, such as charging stations. California also continues to award a higher tax credit of up to US$ 12,500 for the purchase of an electrically powered car. Regulatory incentives include prescribing the number of charging stations at newer buildings. The Californian cities of San Francisco, Los Angeles and San Diego are in the top five US cities in terms of E-Mobility.

California is therefore regarded as the hub of E-Mobility in the US. This can also be seen in the clusters of smart grid and energy storage companies that have already formed in Silicon Valley. Vehicle manufacturers such as BMW, Mercedes-Benz and Volkswagen, but also Tesla Motors and Fisker Automotive, have branches and research centres there.

One milestone in charging infrastructure was set by Tesla Motors. The manufacturer has so far installed nine so-called superchargers in California. Drivers of the Model S can recharge their 85 kWh batteries up to half-full in just half an hour and then drive on for another 150 miles. Tesla wants to install more than 100 of these superchargers on busy routes in the US by 2015. The aim is to build up a network of charging stations that allows drivers to cover long distances in a purely electric car.

_Ina Röpcke_
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