A growing but volatile market

At this PV installation on a former waste tip in Germany the modules form the water-transporting layer. The system was developed by Wagner & Co Solar Technology. Photo: Wagner & Co, Cölbe

The German PV market has become less important for the manufacturers of open-land mounting systems. In other parts of the world, however, more large solar farms are being built. The equipment producers are reacting to the changing situation with new systems and savings in materials and assembly costs.

Up to now, the use of PV modules to form a watertight layer has only been known as a concept for buildings. Modules can be used to replace tiles on roofs or brickwork on facades, thus saving costs. Wagner & Co Solar Technology has transferred this technique to mounting systems for use on former waste tips and landfill sites. A good example is the Dörentrup solar farm in the German federal state of North Rhine-Westphalia. In two phases, Wagner & Co covered around 40,000 m² with PV modules at the site. The special factor in the system is the supporting construction. The modules are placed on a base of profiled sheeting; on their edges, rain water is collected in channels and directed to a drainage point. The PV system therefore functions as a water transporting layer and the former waste tip does not need to be additionally sealed. According to the company, this is a new development in the open-land PV segment.

The example shows how manufacturers of open-land mounting systems are trying to adapt to changing market conditions. The boom in large solar farms has currently subsided – at least in Germany. In some countries around the world, however, the market is growing. The response from the suppliers is new mounting systems for smaller installations in Germany and cost savings in the use of materials and in transport in order to remain competitive, especially in other countries.

Smaller systems and own consumption of electricity

In 2011 the German government drastically curbed the expansion of the open-land market. According to the Renewable Energy Act (EEG) a feed-in tariff is now only paid for systems located on land-use conversion areas or in a corridor of 100 m along railway lines and motorways. On the 1st April 2012 the EEG conditions were revised again. Since then, only open-land systems with a capacity of up to 10 MW have received remuneration. In the meantime, the feed-in tariffs have fallen to less than 0,10 €-ct/kWh. This has had a devastating effect on the market. “Hardly anything is now being built in Germany”, regrets Hans Urban, Deputy Director of Schletter GmbH. In response to the new rules for remuneration, the solar farms being constructed have also become significantly smaller.

Occasionally, new PV systems are still being constructed on waste tips and landfill sites in Germany. Locations along railway lines and motorways are seldom attractive as there is usually a lack of electricity consumers in the immediate neighbourhood. Since the reduction in remuneration, open-land systems – as well as roof-mounted systems – are now being considered from the point of view of own consumption of electricity. “This means that east-west installations have become more interesting, as have systems which result in an added value in addition to the generation of electricity”, says Steffen Stiehl, Product Manager for Mounting Systems at Wagner & Co Solar Technology.

Andreas Oberhauser, Managing Director of Oberhauser Solar-Befestigungssysteme, sees that other changes have also occurred on the German market. Because of the reduction in feed-in tariffs a ferocious price war has started, he says. “In addition, due to the monthly degression there is high pressure on delivery times and on completing construction before the end of the month in question.” Joachim Leibold, Head of Sales at Habdank PV-Montagesysteme, sums up the German market as

being “difficult, but not hopeless”. One just needs to wait. “There are plenty of projects waiting in the wings.” It is also possible to build systems without any EEG remuneration, he points out.

This potential is also seen by Stiehl from Wagner & Co. He thinks that local community projects in which municipal energy suppliers are integrated are a market of the future for open-land systems. “Regional climate protection targets are generally more ambitious than those at the federal level”, he explains. Robert Vogt, Product Manager at Creotecc GmbH, hopes that agricultural businesses will install systems to provide electricity for their own consumption: farms have a lot of potentially available land.

Unfortunately, this optimism is not shared by others who were asked. Urban from Schletter, for example, does not think that in the near future a large number of systems will be built without the benefit of EEG remuneration. “From an economic perspective, many firms could benefit from producing electricity for their own use, but industrial companies generally do not have large open areas available, and when they do, the land is often too expensive.”

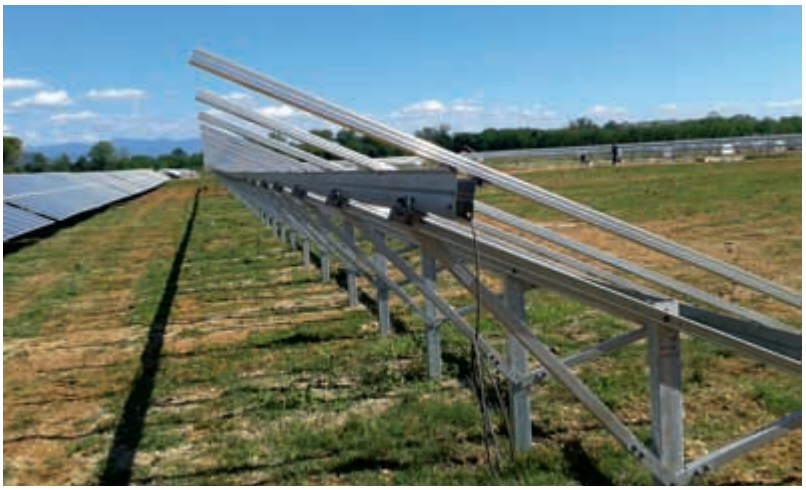
Volatile global markets

So it is well worth taking a look at the global markets because in some regions of the world the situation looks much rosier. In Europe, Romania is currently a lucrative market. “The background to this is the feed-in tariff of 0,25 €-ct/kWh for open-land systems that is in place for 2013”, explains Klaus Richter, Head of Open-Land Systems at K2 Systems. There is also no limitation on the total land area available in the country. K2 currently receives most enquiries from Romania.

Solar farms are being built in Britain, Austria and Turkey, and also in France. Here, Exosun, a manufacturer of solar trackers for large-scale systems, is currently profiting from the advantageous situation, as Marketing Director Maria Lahuerta reports. In both 2012 and 2013 the French government invited tenders for solar farms in which PV tracking systems are to be used.

In Asia the Japanese market is attracting PV suppliers from throughout the world. In the US new legislation in some states has ensured that solar power

If the ground is not suitable for pile driving, concrete foundations are an alternative option. Photo: Schletter



This solar farm in Italy was constructed using a mounting system from Habdank.

Photo: Habdank PV-Montagesysteme

stations will be built. In South America, Chile is currently an interesting market. "Here, classical power purchase models are in use", says Leibold from Habdank. Mine operators in the north of the country, for example, use a lot of electricity, which can be produced cheaply by solar farms. "I see Chile as a stable, growing market", says Leibold. The market for open-land systems is also growing in South Africa, where the state has invited tenders for solar farms in 100 MW blocks.

But the overseas markets do not compensate for the demise of the German market, emphasises Urban from Schletter. Some very large projects are being realized in other countries. "But the volatile and changing markets, with all their challenges, cannot replace the German market."

Many countries have specific regulations that make it difficult for foreign suppliers to participate there. Several manufacturers cite "local content" requirements as the biggest hurdle. Canada was the first country to demand that a certain percentage of the components used must be manufactured within the country. South Africa also has such a rule. Ten percent more remuneration is paid if locally produced products are used.

Aluminium or steel

The greater competition that the industry now faces has already been mentioned. Additionally, the cost of the modules has fallen so dramatically that for the last few years efforts have been made to save more money on the supporting constructions in order to reduce project costs further. This means that the material used is of great significance. Aluminium for the structure and connecting pieces made from stainless steel are the classic solution. With increasing price pressure, more and more manufacturers are switching to cheaper galvanized steel, although this development has recently slowed.

Nevertheless, there are still supporters of the classical variant such as Wagner & Co Solar Technology. A well-designed aluminium system can be priced at the same level as a galvanized steel system, but the associated costs can be lower, says Stiehl in justification of this decision: aluminium systems are easier and more flexible in assembly and transport costs are less due to the lower weight. He quotes prices for aluminium systems as "starting at € 85" per kW of PV capacity. A cheap steel system currently costs around 70 to 75 €/kW.

K2 also wants to continue to use aluminium. "For us, the material has the advantage that with a tensile strength similar to that of steel we are able to make 100 % use of our components", says Richter, explaining this decision. One of the biggest advantages is the resistance of aluminium to corrosion. "This means that we can do without a further, very expensive, production stage." In order to make steel systems corrosion resistant they need to be galvanized. The quality of the zinc coating determines the quality of the finished stands.

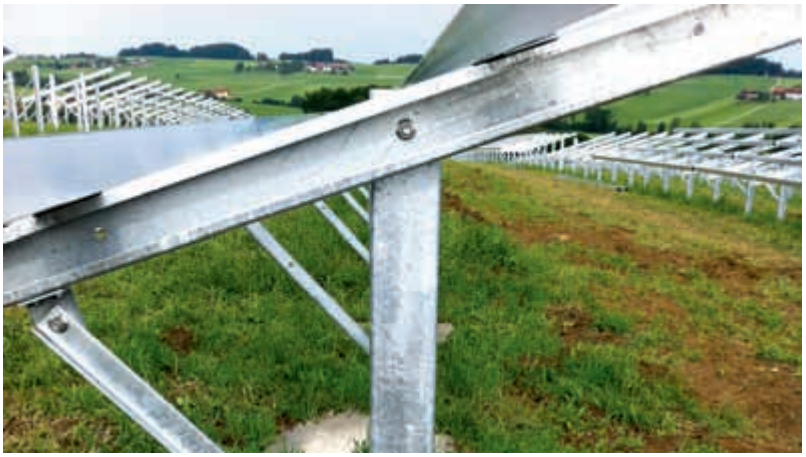
Alumero and Habdank, for example, use a combination of aluminium and steel. Alumero makes the lower section from galvanized steel and the upper section from aluminium. Leibold of Habdank suggests that the choice of material should be considered locally. The important question is: "When and where do I need to deliver?" says Leibold. If, for example, a solar farm is to be built in Namibia, the manufacturer must ask himself whether it makes sense to transport steel from here to there, or whether there is a factory in the country that can process aluminium for a lower cost. In the end Leibold argues for a combination of aluminium and steel. The challenge, he says, is to find an appropriate mixture of ease of assembly and acceptable material costs. Habdank therefore offers various combinations, for example 80 % steel and 20 % stainless steel.

The potential savings through the choice of material are no longer so great, especially as cost reduction via material optimization has already been an issue for a number of years. But K2 Systems has found an opportunity. The company is currently developing a new open-land stand that is a further development of the single-leg pile-driven system T-Rack 2.12. "We see the greatest potential for optimization in the module mounting rails", says Richter. For the new system, K2 is developing a new form of rail, which will increase the span width by up to 25 %. The modular construction allows for any size of system, adds Richter.

The Italian manufacturer A+ Sun Systems is taking a completely different route. Since the middle of

The picture shows a system from Alumero in which driven piles are combined with concrete foundations.

Photo: Alumero Systematic Solutions GmbH



The French manufacturer Exosun offers this tracker system. The company says that the price difference between single-axis tracker systems and fixed-position stands is now very small. Photo: Exosun

2012, the startup company has been offering a mounting system in which the modules are placed on steel wire. Systems with a capacity of 500 kW have so far been installed in Italy, reports Alessia Moratti of the Marketing Department. The company is working with the German systems supplier Conergy and is currently expanding its sales operations in Africa, Europe and the Far East.

Further attempts continue to be made to save money in the logistics chain. Oberhauser, for example, reduces the costs for transport by unifying the lengths of the steel components. This allows space to be saved when loading the materials into trucks or containers. Shorter assembly times are still a target. This can be achieved, for example, by reducing the number of individual components.

Systems for very small installations

Small installations and east-west systems are the current trends in Germany. As a result, more equipment for these purposes is being offered. Creotecc, for example, has recently started selling the system "Creoterra Quickroot" for smaller open-land systems of 6 kW and upwards. "With smaller installations the cost advantages of large projects such as the division of the fixed planning costs over a greater volume and the more rational use of machines do not apply", explains Vogt regarding the background to the development. Therefore, the costs for planning and assembly must be kept low in other ways if smaller open-land systems are to be economically viable. The new system can be planned and assembled by the customer himself "in the simplest possible way", says Vogt.

The new Italian company A+ Sun Systems has developed a system in which the modules are fixed to steel cables. It has been on sale since the middle of 2012. So far, installations with a total capacity of 500 kW have been constructed in Italy using the system. Photo: A+ Sun Systems

According to the manufacturer it can be adapted to suit widely varying ground conditions. Due to the low anchoring depth it is also suitable for former waste tips and landfill sites. Steep slopes can also be compensated for, as large machines are not required and the posts are available in different heights, adds Vogt. "In principle, you only need a spade and a watering can, but a mini excavator would also be useful."

Together with Frankensolar, Wagner & Co. Solar Technology has also developed a system for smaller installations. The stand "Tric flex one" is also notable for its ease of planning and construction. The elements are preassembled and a survey of the ground is not necessary, according to the company. Because the foundation elements are pre-mounted, there are no extra costs for concrete foundations.

For east-west orientated installations, Wagner & Co and Frankensolar offer the system "Tric flex four". The aluminium and stainless steel system can be installed at an angle of between 0 and 45°, and is also simple and quick to assemble, reducing system costs. Schletter and Habdank also offer east-west systems.

In order to reduce the cost of land, space must be used as efficiently as possible. East-west systems are suitable for this because they require little space between the rows and more modules can be installed than with an orientation to the south. "Due to the shorter distances, the cost of cabling for east-west installations is lower and inverters can be dimensioned smaller because the modules never all produce electricity at their maximum capacity at the same time", says Vogt regarding the potential savings with these systems.

In relation to the foundations there have been no great changes. Pile-driven foundations are still the cheapest and most common solution. On sites where the ground conditions do not allow any piles to be driven, for example on former waste tips or landfill sites, on rocky or very soft ground, or land prone to flooding, as well as sites where it is not possible to use heavy machinery, concrete, plate or screw-in foundations are used. Renusol continues to use its plastic container base "ConSole". The company promotes the product for flat roofs and for open-land installations, especially on former waste tips and landfill sites.

On the international market Exosun would like to gain more market share for its tracking systems. "The cost of single-axis solar trackers has fallen significantly; the price gap compared with fixed-tilt systems is becoming very small," says Maria Lahuerta, Marketing Director at Exosun. In addition to its home market, Exosun is principally active in the US, South Africa and Chile. Under certain circumstances single-axis solar tracking systems could also become more interesting for the German market, thinks Leibold from Habdank: namely, when the feed-in tariff in its current form ceases to exist. With systems for own consumption or direct marketing of electricity, continuous yields throughout the day are more important – and this can be achieved using tracking systems. Maybe this is a trend of the future for the open-land market.

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