SMA SOLAR TECHNOLOGY AG

TRANSFORMATION

ENERGY FOR CHANGE

ENERGYDRIVEN

The U.S. market offers excellent opportunities

SUNBOOM

With photovoltaics, India's growth will become independent of coal and nuclear power

GAMECHANGER

Battery-storage systems are the key for the energy supply of the future

POLEPOSITION

SMA flexibly positions itself for the future

ENERGY FOR CHANGE

Energy supply structures all over the world are undergoing fundamental change. In the new energy landscape, inflexible, large-scale fossil fuel and atomic power plants are becoming increasingly unprofitable. Large electric utility companies are losing market shares and realigning their business models. At the same time, private and institutional investors are becoming more important and, on the basis of renewable energies, using innovative ideas to shape the digital and networked energy supply of the future.

Energy transition 2.0 is therefore in full swing. As part of this trend, energy is increasingly becoming a public commodity, a matter of course, that is sustainably and cost-effectively available to everyone not only in industrialized countries but also in newly industrialized and developing countries. Political incentive programs, which are often subject to unpredictable changes from one day to the next, are becoming less important globally in light of the continuing advance of renewable energies. In fact, technological developments and new services being offered are defining the transformation of the energy sector and the success of renewables, thereby allowing them to maximize the advantages they have over conventional energy generation.

SMA used the past year to reposition itself in line with these changing conditions and to be able to assume its key role in the energy supply of the future. With a comprehensive company transformation, we have placed ourselves in an even more flexible position. We further optimized processes and considerably reduced our break-even point, while simultaneously retaining our high capacity for innovation, even with a reduced workforce.

On the following pages, you will read all about the story of this transformation as well as about the success that SMA is enjoying in what is now one of the biggest and most important photovoltaic markets: the U.S. You will also find out about the significance of battery-storage systems in the energy supply of the future, and how India – one of the fastest-growing newly industrialized countries – is looking to exploit renewables as a driver of further economic and social development. However different the topics, one thing is crystal clear, SMA will play a significant role in all these areas – and beyond – and will decisively contribute to shaping the transition of the energy supply, worldwide.

ENERGY DRIVEN

In 2000, SMA ventured into the U.S. – at a time when photovoltaics had zero market share. Then, in 2010, in the middle of the financial crisis, the company set up its own production facility in the U.S. Today, it's clear that these decisions were the right ones. The U.S. is now one of the biggest PV markets worldwide, with SMA as a key player in this important market. And the future's looking good. Large-scale PV power plants in sun-drenched states like California are already generating electricity at lower costs than conventional coal and gas power stations – the perfect ground for further growth.

7.3 GW

of PV power were installed in the U.S. in 2015, making it one of the world's biggest markets.

66%

of new installations were large-scale PV power plants.

31%

of the global market in 2016 will, according to SMA estimates, be attributable to North and South America.

From left to right: Michael Mendik, Scott Crabtree, Marko Wittich, Chuck Smith

Quality, efficiency and reliability – operators of large-scale PV power plants value the Sunny Central 2500-US as well as SMA's comprehensive range of operation and maintenance services.

IN THE LAND OF UNLIMITED OPPORTUNITIES

Anyone who flies into Denver, Colorado, will see even on the landing approach just how popular photovoltaics are here. Rows and rows of countless solar panels, shimmering black and blue, are combined to form PV power plants. For Marko Wittich, this is no longer an unfamiliar sight and yet it "never fails to fascinate me," said the SMA manager responsible for sales in North and South America. "SMA could not have chosen a better production site than here in the U.S."

Wittich is a member of the four-strong management team that to a large extent controls the business of SMA America. Alongside Wittich, who is German, native Czech Michael Mendik and Americans Chuck Smith and Scott Crabtree are responsible for development, service and operational business. Together with around 400 employees, they ensure that SMA reaps the benefits of the current growth in the U.S. to the greatest possible extent.

The figures speak for themselves. The U.S. market has grown continuously over the past few years and in 2015 was ranked third globally for newly installed PV power. In 2016, according to SMA estimates, the market might grow by 11 GW – a new record and an increase of 43% on the power installed up until then. The market for storage solutions is also increasingly gaining momentum.

LOCAL SALES, PRODUCTION AND SERVICE

SMA recognized the potential of this market early on. In an office trailer in sunny California, the company's first foreign subsidiary began operation in 2000. In view of the enormous growth potential, the company then invested in the future in the middle of the financial crisis, opening its state-of-the-art production facility in Denver in 2010. Since then, SMA has also been producing the majority of its product solutions for North and South America there. Crabtree is responsible for production and was there when ground was broken. "We managed to get production up and running within just a few months," he remembered. Denver was chosen not only because of its central location in the U.S., its airport and its excellent infrastructure, but also because it is a university city, explained Mendik, who is responsible for development at SMA America and has been living in the U.S. for 15 years. "A lot of people here work in the technology sector, which makes it easier for the company to snap up highly skilled engineers."

After all, SMA also conducts development right here in Denver. "This enables us to respond more effectively to changes that happen locally," he explained of the advantages. One reason for being successful in the region is to understand what local customers need. And that's not easy in the U.S. because, according to Mendik, the situation can vary considerably from one state to the next. When it comes to the other unique selling propositions SMA has in the U.S., the four managers are unanimous. "Americans value above all the high power density, efficiency and reliability of our products," said Wittich. "Another crucial factor when it comes to choosing a provider is the service. This is something that our customers often tell us," added Smith. Following countless conversations with his customers, he is sure of one thing: "Our products and system solutions, combined with our service, are unique on the U.S. market. Nobody else in this country offers a comparable service network."

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Competitive – in sunny regions of the U.S., large-scale PV power plants already produce electricity more cost-effectively than conventional power plants.

COMPACT POWER FOR PV POWER PLANTS

Thanks to Sunny Central 2500-EV-US, the latest and most powerful inverter in the SMA central inverter family and a central component in its Utility Power System, PV power plants can now be operated exceptionally efficiently and economically with the 1,500 V technology. This turnkey system comprises a central inverter, medium-voltage transformer and switchgear and DC technology for direct connection to utility grids. It can be used with nearly every PV module type currently available and is suitable for outdoor installation.

With its compact design featuring perfectly synchronized components, the SMA Utility Power System helps cut transportation and installation costs, and significantly reduces the amount of time needed to commission PV power plants. The system expands PV power plants' capabilities and is ready for use with state-of-the-art battery storage technology.

COMPREHENSIVE SYSTEM SOLUTIONS FROM A SINGLE SOURCE

For operators of large-scale PV power plants, these are key criteria in making a purchasing decision because they enable operators to guarantee a stable and efficient energy supply. In 2015, SMA entered into a strategic partnership with Siemens' Energy Management division to offer customers even more comprehensive solutions in this market segment. The partners offer coordinated system solutions and services from a single source. "With this, we can offer our clients complete system solutions ranging from the inverter to grid connection. In addition, specialists from both companies can optimally support them from project planning through to system operation," explained Wittich, describing the advantages. " Our clients are in the position to work directly with the best experts for inverters and electrical power distribution. This distinguishes us from our competitors."

Swinerton Renewable Energy, a San Diego-based engineering, procurement and construction company, has also been convinced by SMA's high product quality and well-developed service network. SMA is supplying 349 central inverters with a total capacity of 710 MW to 17 large-scale PV power plants in several U.S. states. The partnership with Swinerton has gotten off to a great start. All 17 plants – each with capacities ranging from 5 MW to 155 MW – will be completed during the course of 2016.

STABLE FRAMEWORK CONDITIONS FOR FURTHER GROWTH

The Swinerton order is a great example of how SMA has successfully leveraged its presence in the U.S. Its market share continues to grow. From around 25% in 2013 to about 40% in 2015, SMA has enjoyed growth in all segments – from inverters for small to medium-sized residential and commercial applications to solutions for large-scale PV power plants. "Our brand awareness and reliability are paying off," said Wittich.

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11 GW

of PV capacity will be newly installed in the U.S. in 2016 according to SMA estimates.

POWER SYSTEM

SMA's rapidly growing PV market share can also be seen in its operations and maintenance business (O&M business). SMA offers comprehensive service that covers not only inverters but also medium-voltage components, modules, racks and all cabling as well as the vegetation and enclosure of the systems. The services include repair, device replacement, visual inspections and maintenance. In this way, PV system operators benefit from maximum performance and planning security – and they have complete peace of mind. "In this still young area of business, we already have large-scale PV power plants with a total capacity of almost 1 GW under contract here in the U.S.," said Smith. As a result, SMA is also a major player in this area – and is ideally positioned for continued growth.

There is no doubt that growth will be rapid. Today, it is already less expensive for homeowners to generate their own electricity with photovoltaics than purchasing it from a utility company. In some regions, operators of large-scale PV power plants can already offer more attractive rates than their competitors in the field of conventional power generation when concluding power purchase agreements (PPAs). In addition, in mid-December 2015, the U.S. government decided to extend tax incentives (ITC: Investment Tax Credit) for PV systems to 2020. This will help create a stable framework in this key sales market. "The U.S. market is becoming less dependent on state support. The extension of tax incentives will tide us over until solar energy is completely competitive and clearly the most cost-effective method of generating power everywhere in the U.S.," explained Wittich. Like Mendik, Crabtree and Smith, he is already looking forward to leveraging the resulting opportunities for SMA.

THE U.S. IS ONE OF THE WORLD'S MOST IMPORTANT PV MARKETS

SMA HAS SYSTEMATICALLY EXPANDED ITS MARKET SHARE

PV POWER PLANT OPERATORS BENEFIT NOT ONLY FROM SMA'S COMPREHENSIVE PRODUCT SOLUTIONS BUT ALSO ITS ALL-ROUND SERVICE

THE U.S. MARKET WILL CONTINUE TO GROW CONSIDERABLY

Locational advantage – SMA produces inverters for the North and South American markets at its facility in Denver.

SUCCESS FIGURES

In 2000

SMA's founders established a sales and service company in California.

1 GW

of PV capacity under contract for SMA's O&M business in North America.

38%

is the market share SMA has in the U.S., measured according to total installed power.

In 2010

a production facility was set up in Denver.

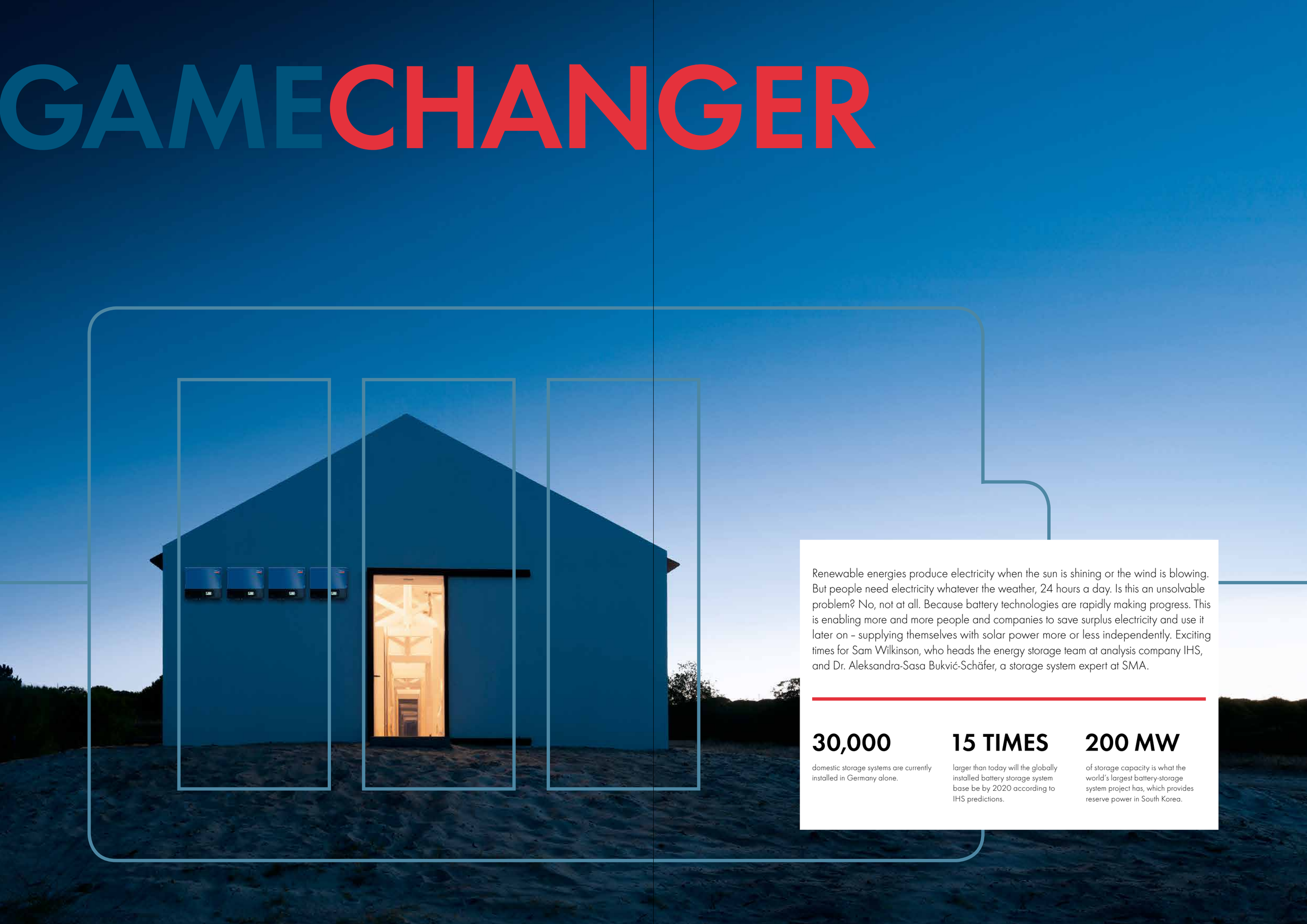
400

of the company's employees work in the U.S.

€429 MILLION

was SMA's sales total achieved in North and South America in 2015.

GAMECHANGER



Renewable energies produce electricity when the sun is shining or the wind is blowing. But people need electricity whatever the weather, 24 hours a day. Is this an unsolvable problem? No, not at all. Because battery technologies are rapidly making progress. This is enabling more and more people and companies to save surplus electricity and use it later on – supplying themselves with solar power more or less independently. Exciting times for Sam Wilkinson, who heads the energy storage team at analysis company IHS, and Dr. Aleksandra-Sasa Bukvić-Schäfer, a storage system expert at SMA.

30,000

domestic storage systems are currently installed in Germany alone.

15 TIMES

larger than today will the globally installed battery storage system base be by 2020 according to IHS predictions.

200 MW

of storage capacity is what the world's largest battery-storage system project has, which provides reserve power in South Korea.

GAME CHANGER

60% cost-reduction was achieved in the area of battery-storage systems over the past few years.

STORAGE SYSTEMS ARE REVOLUTIONIZING THE ENERGY LANDSCAPE

Dr. Bukvić-Schäfer, Mr. Wilkinson, battery-storage systems were a very marginal topic in the energy supply debate for a long time. Why are they now all of a sudden the object of such intense interest?

ALEKSANDRA-SASA BUKVIĆ-SCHÄFER: Renewable energies are taking on an ever greater share in global electricity supply. This is a good thing as we must lose no time in becoming less dependent on energy sources such as coal, oil and nuclear power, which are harmful to the climate, hazardous and only available in limited supply. If this is to be a success, electricity from renewable sources must be calculable and readily available at all times. This is where battery-storage systems come into play. If too much solar or wind power is produced, these systems store the surplus electricity and release it systematically when it is needed. Storage technology has made enormous progress, in recent years in particular.

SAM WILKINSON: Yes, indeed, recent years have been very exciting. A number of new manufacturers have entered the market. As a result, costs have fallen dramatically and battery systems are already being used cost-effectively in some countries today. It is also interesting to note that more and more major car manufacturers are discovering the storage market for themselves.

In what sense?

SAM WILKINSON: The presence of major automotive companies in this space can only help to raise awareness and understanding of the benefits of storage. Clearly, these companies have very strong brands and established sales channels in the consumer space and this will put them in a very strong position, particularly in the residential sector.

ALEKSANDRA-SASA BUKVIĆ-SCHÄFER: Let's take Tesla, for example. The announcement of the Powerwall battery triggered a downright run, and a large number of the potential customers had definitely never thought about generating and storing their own electricity before.

SMA has engineered a battery inverter to integrate the Tesla Powerwall into the system, as the battery on its own is not sufficient, isn't that true?

ALEKSANDRA-SASA BUKVIĆ-SCHÄFER: Exactly, with our new Sunny Boy Storage, we have the optimum means of integrating the Tesla Powerwall into household systems. It converts the direct current from the battery into alternating current for use in the household. It also ensures the intelligent charging and discharging of the battery. We have just brought the new solution to market. It is cost-effective, flexible and easy to install. Because it is AC-coupled, which means that the storage system operates in parallel with the PV system, the solution can be easily used in new as well as in existing systems.

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SAM WILKINSON
Sam Wilkinson has been monitoring the photovoltaic markets for IHS, one of the world's leading analysis companies, for seven years. He initially focused on inverters and modules, before setting up the research team for energy storage, which he still heads today. He is fascinated in particular by the rapid developments and changes taking place on the market and in the industry.

DR. ALEKSANDRA-SASA BUKVIĆ-SCHÄFER
While studying for a degree in electrical engineering in the mid-1990s, Aleksandra-Sasa Bukvić-Schäfer first came into contact with the subject of renewable energies – and knew straight away that she did not want to work in any other industry. After conducting research on this subject at the University of Kassel and the Fraunhofer Institute for Wind Energy and Energy System Technology, she joined SMA in 2010 as a senior expert engineer for storage technologies.

"Battery-storage systems are the key to the successful transition to a completely renewable and decentralized energy supply worldwide."

Aleksandra-Sasa Bukvić-Schäfer

But Tesla isn't the only manufacturer that SMA works with.

ALEKSANDRA-SASA BUKVIĆ-SCHÄFER: With regard to car manufacturers, our partnership with Daimler subsidiary Deutsche ACCUmotive is important. Not only is Daimler a leader regarding their engagement in the field of stationary battery storage, but also regarding eMobility. We want to commercialize this topic also on a broad basis as soon as possible. And naturally, we work together with all reputable battery manufacturers as well. The decisive factor being that we are always able to offer our customers the most powerful battery at the lowest system cost. We therefore take an intensive look at the different technologies and marketing approaches.

What trends are you observing on the storage system market at present?

SAM WILKINSON: One of the most exciting trends for me is the bundling of energy storage systems in private and commercial systems to create what are known as virtual power plants. Up to now, it has been almost impossible to use individual storage systems in such a way that they support the grid while also increasing PV system operators' self-consumption. Systematic usage of storage systems for both purposes is not possible without central management of multiple systems by a third party. This enables PV system operators to not only save on their electricity costs with their storage systems, but also earn extra money. This is a completely new business model that has only been tried out in a few markets so far. But contracts have already been signed for larger-scale future projects, in the U.S. for example. All in all, batteries are increasingly being considered for providing frequency regulation and other ancillary services to grid operators.

With a PV system containing a storage system, consumers can generate and use a large share of their electricity themselves – which is an efficient means of saving on their electricity costs.

ALEKSANDRA-SASA BUKVIĆ-SCHÄFER: This is also an important driving force behind large-scale storage systems in the multi-megawatt range. Such projects are already being successfully implemented in Europe, South Korea and the U.S., for example, and are proving their economic viability. In South Korea, the world's so far largest storage system project for 200 megawatts of reserve power has just been built using SMA technology.

What are you expecting in the years to come – how will the storage system market develop globally?

SAM WILKINSON: At IHS, we are predicting storage system prices to continue falling and the installed base to grow considerably – from its current level of just over one gigawatt to over 15 gigawatts in 2020. In the short-term, the U.S., Japan and South Korea will remain the largest markets. A stable market for domestic storage systems has already established itself in Germany, but the next few years will definitely see some activity in the field of large-scale storage systems as well. Significant projects have already been announced. We believe there to be considerable potential for domestic storage systems in Australia and Great Britain, too. This means that the coming years will definitely be exciting years, and new market participants and technologies will ensure even more surprises.

Dr. Bukvić-Schäfer, Mr. Wilkinson,
thank you very much for the interview.

BATTERY-STORAGE SYSTEMS MAKE ELECTRICITY FROM RENEWABLE ENERGIES READILY AVAILABLE AT ALL TIMES

STORAGE SYSTEM COSTS HAVE FALLEN DRAMATICALLY

THE GLOBAL MARKET WILL GROW CONSIDERABLY IN THE COMING YEARS

AN INDEPENDENT ELECTRICITY SUPPLY FOR YOUR HOME

It is much less expensive for PV system owners to generate their electricity themselves than purchasing it from a supplier. A battery-storage system allows PV system owners to use solar energy even when the sun is not shining. SMA has more than 25 years of experience in integrating storage solutions into systems and offers storage systems that are efficient and easy to install and operate. The latest product of SMA's portfolio, which includes fully integrated as well as flexible solutions, is the Sunny Boy Storage. This device has been specially designed for high-voltage batteries like the Tesla Powerwall. The system is so flexible that it can be adapted at any time, cost-effectively and effortlessly to meet the changing needs of its owner, whether for new or existing systems.

1
PV cells generate direct current from sunlight.

2
The PV inverter converts direct current from the modules into alternating current. Depending on demand, it is consumed directly in the home, stored, or fed into the utility grid.

3
The battery inverter integrates the battery into the system. It converts direct current from the battery into alternating current suitable for home use and ensures intelligent charging and discharging of the battery.

4
Excess power is stored in batteries for later use, which means that solar power can also be used at night.

5
The Sunny Places online portal allows PV system operators to always be able to see whether their PV system is running optimally or whether the electricity in their home is being consumed, stored, or fed into the utility grid.

6
Electric vehicles can be integrated automatically and intelligently into your home's load profile so that they can absorb any excess solar power.

SMART HOME

SUNBOOM

India's economy and population are growing steadily. The country's electricity supply cannot keep pace with this rapid growth. Power outages are part of everyday life. To ensure continued growth, this dynamic, newly industrialized country is in urgent need of a reliable, cost-effective and sustainable electricity supply that is independent of coal and nuclear power. Which is why the Indian government is looking to solar and wind power. Raveesh Kumar, the Consul General of India in Frankfurt, is confident that renewable energies are essential for the economic development and prosperity of his country.

320 DAYS

of sunshine per year mean that India has the ideal conditions for photovoltaics.

100 GW

of solar energy is to be installed in this emerging country by 2022, to satisfy the demand for energy.

60%

of India's current electricity supply is still coal-based.

"Only with a clean and stable energy supply can India's economic development gain pace over the coming years."

Raveesh Kumar

DYNAMIC GROWTH NEEDS A RELIABLE ENERGY SUPPLY

Mr. Kumar, what will India look like in 5 to 10 years?

RAVEESH KUMAR: My vision is that we can provide all of my fellow countrymen and countrywomen with reliable and affordable energy as quickly as possible. I am delighted that the government is committed to making a reliable electricity supply available to all citizens by 2019. The contribution renewable energies will make here, will be enormous.

India is one of the world's fastest-growing national economies. What are the biggest challenges?

RAVEESH KUMAR: We have to pursue a path of growth that safeguards the livelihoods of our population. This also includes the development of a solid infrastructure and access to better health and educational facilities for all citizens. Our biggest challenge here is to ensure that the fruits of economic development and increasing prosperity are redistributed such that they also reach economically and socially disadvantaged people.

What significance will a reliable, clean and affordable energy supply have here?

RAVEESH KUMAR: India has to grow at a healthy rate if we are to realize our dream of liberating people from poverty. Growth will create jobs and security for people. A stable and secure energy supply is a key criterion for ensuring that the motor driving India's economy continues to gain speed over the coming years.

What specific measures is the government taking in this regard?

RAVEESH KUMAR: The government's aim is to generate significant growth of renewable energies to transform India. Renewables should also help ensure that energy can be supplied at a decentralized level, which will benefit people locally and cut the cost of expanding line and grid configurations. To achieve this goal, the government has already taken some key steps, for example with its ambitious target of covering 40% of the country's energy demand with renewables by 2030. In addition, India's Ministry of New and Renewable Energy (MNRE) has also set up a number of central bodies to promote photovoltaic projects.

With increasing prosperity, more people will no doubt be able to afford private PV systems. How do you view the potential here?

RAVEESH KUMAR: Our Prime Minister, Narendra Modi, recently confirmed that it is India's aim to make solar energy an integral part of our life. In this way, villages and communities that have always been off-grid will now have access to electricity. This is a very clear signal of how renewable energies can be integrated into everyday life in India. The potential for not only photovoltaic power plants but also small-scale residential and commercial installations is high.

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Raveesh Kumar joined the Indian Foreign Service in 1995. Since September 2013, he has been representing his home country as the Consul General in Frankfurt.

The energy demand of India's economy and population is enormous – and can be met reliably and cost-efficiently using renewable energy.

Why does India need photovoltaics?

RAVEESH KUMAR: To tackle climate change, India has voluntarily agreed – by 2020 – to reduce its CO_2 emissions by 20–25% from the level they were in 2005. An increasing proportion of renewable energies will help India achieve this goal. The plans for photovoltaic installations are ambitious. Currently, 60% of India's energy generation capacity is coal-based. Our net coal import is rising. Together with increasing oil imports, our country depends on imports to cover 28% of its energy needs. India also suffers from energy scarcity, with only 55% of households in rural regions having access to electricity. Photovoltaics and other renewable energy sources could fill the gap between supply and demand much more quickly than conventional energy forms. For this reason, the government launched the Jawaharlal Nehru National Solar Mission in 2010.

What impact has this had?

RAVEESH KUMAR: It's really impressive to see how the installed power from grid-tied solar power increased from almost nothing to 941 MW by 2012. By the end of September 2015, India had already exceeded the 4-gigawatt mark – a huge jump from 2012. The aim is to install PV systems with a total output of 100 GW by 2022 as part of this program.

There is still a long way to go before the 100 GW mark is reached. What will it take to ensure that this energy supply is in place both as quickly as possible and sustainably?

RAVEESH KUMAR: India believes that economic progress and environmental protection are not mutually exclusive but in fact can go hand in hand. The biggest challenge, of course, is implementing such a mammoth project in a country as multifaceted as India. What is required here is a solid framework with clear deadlines to enable speedy implementation of the projects at the federal and state level.

What role can international companies like SMA play in this?

RAVEESH KUMAR: With its enormous population, ideal locations, growing energy demand, electricity deficit as well as limited access to fossil fuels, India is one of the most important photovoltaic markets and welcomes foreign investment. This opens up a whole range of opportunities for international companies like SMA. I am happy to note that SMA, with its high-quality and technologically advanced solutions, is committed to the Indian market and could play an important role in achieving the ambitious solar energy target to ensure the future energy supply of the country.

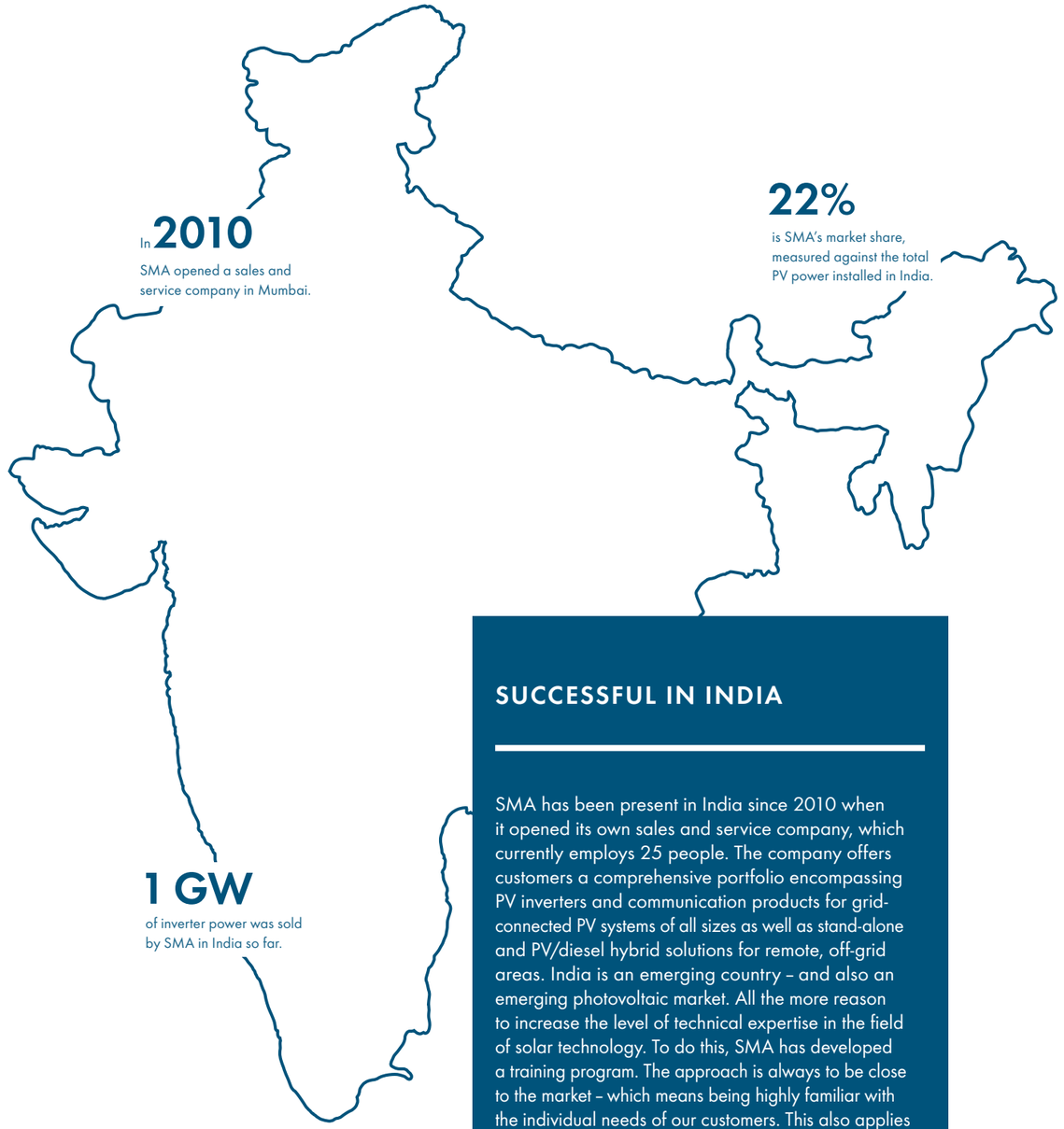
Mr. Kumar,
thank you very much for the interview.

INDIA IS A FAST-GROWING NATIONAL ECONOMY

THE DEMAND FOR ENERGY IS CONTINUOUSLY GROWING

THE GOVERNMENT IS FOCUSING ON RENEWABLE ENERGIES

INDIA OFFERS PERFECT CONDITIONS FOR PHOTOVOLTAICS



SUCCESSFUL IN INDIA

SMA has been present in India since 2010 when it opened its own sales and service company, which currently employs 25 people. The company offers customers a comprehensive portfolio encompassing PV inverters and communication products for grid-connected PV systems of all sizes as well as stand-alone and PV/diesel hybrid solutions for remote, off-grid areas. India is an emerging country – and also an emerging photovoltaic market. All the more reason to increase the level of technical expertise in the field of solar technology. To do this, SMA has developed a training program. The approach is always to be close to the market – which means being highly familiar with the individual needs of our customers. This also applies to our service offering. With service stations distributed throughout the country, the SMA experts can reach customers quickly whenever required. Another factor in our success in the price-sensitive Indian market is that we offer high-quality product solutions that not only can withstand extreme temperatures, sandstorms and monsoon rains but also deliver major financial benefits for PV system operators.

POLE POSITION

The market for PV inverters is undergoing a period of radical change. To stay ahead, a company needs to position itself in an extremely agile, cost-conscious and flexible way. SMA met this challenge head-on with an extensive transformation. The Managing Board set targets and the framework while Corporate Development created the concrete strategy. Executives from Operations, Sales and Service, Development, Human Resources and Corporate Communication drove the process forward, among them Lina Sabine Soldner, Mark Grosse and Mike Terlinden.

€160 MILLION

is the amount of fixed costs that SMA wants to save as a result of the transformation.

80%

of the savings have already been achieved by SMA in the transformation year.

9 MONTHS

after the transformation began, SMA had returned to profitability.

From left to right: Lina Sabine Soldner, Mike Terlinden, Mark Grosse

Mark Grosse is responsible for Global Procurement at SMA.

As change manager, Lina Sabine Soldner supported the restructuring process.

Mike Terlinden is responsible for SMA's operating business.

"Our employees really pushed hard."

Mike Terlinden

AT THE FOREFRONT IN EXTREMELY FLUCTUATING MARKETS

2015 will probably go down as the most exciting year in Mike Terlinden's professional career. He heads SMA's global operating business and not only witnessed but also actively shaped the company's transformation with his colleagues. Terlinden joined SMA in mid-2013. At this time, the German Federal Government was abandoning its subsidization of alternative energies, leaving the up-and-coming photovoltaic market to fend for itself. The numerous amendments to the Renewable Energy Sources Act (EEG) sent the German solar industry into a tailspin before it had achieved competitiveness, with SMA also unable to avoid being affected by the sudden changes.

SMA started taking countermeasures at an early stage, positioned itself in all major markets, catered to users worldwide from private homeowners to PV power plant operators and expanded its service business. However, the 2014 amendment to the Renewable Energy Sources Act (EEG) caused demand in the German market to plummet so dramatically and, above all, so quickly that international business was unable to fully compensate for the decline.

In 2014, SMA suffered the highest losses in the company's history. "It soon became clear that to become profitable again SMA had to increase its flexibility as quickly as possible and adapt the fixed costs to the lower sales levels," explained Mike Terlinden.

TOGETHER, EXECUTIVES FROM ALL DEPARTMENTS ARE DRIVING THE TRANSFORMATION FORWARD

Terlinden is part of the transformation team convened by the SMA Managing Board from various company departments. All objectives were finalized in January 2015. The concrete measures to be taken to implement the new process structures were formulated. "We scrutinized each process and thought about how we could find better solutions to save costs," said Terlinden.

Particularly important at that time were the weekly meetings, where executives discussed what was going well and what had to be done better. This is where Terlinden met Lina Sabine Soldner. As a change manager, she supported the restructuring process, developing concepts and leading workshops. "The most important thing in such a complex process is to continuously review all the measures being taken and their results," Soldner explained. "After all, the company needed to be able to maintain its operational capabilities during each phase of the transformation."

IDENTIFYING POTENTIAL SAVINGS, LEVERAGING PURCHASING PARTNERSHIPS

In 2015, this was a real challenge. But a series of concerted efforts were employed to put SMA back on the road to success. A key starting point was to bundle purchasing, such as components and systems. The entire flow of goods from the supplier right through to the customer was examined in detail. The existing strategic purchasing partnership with its Danish partner, Danfoss, played an instrumental role in this regard. "We also strengthened our collaboration in purchasing to generate additional volume effects and to maximize our global purchasing organization," said Mark Grosse, Head of Global Procurement at SMA.

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RADICAL MARKET CHANGES REQUIRE QUICK AND DECISIVE ACTION

Mr. Körfer-Schün, you have actively shaped SMA's transformation. What was the company's situation at the end of 2014?

MARKUS KÖRFER-SCHÜN: SMA was in an extremely difficult situation. The profound changes in the international photovoltaic markets presented enormous challenges to the entire solar industry. After years of strong growth, the European markets suddenly collapsed as a result of unpredictable political decisions. Demand shifted dramatically, especially to Asia. In addition, Chinese providers entered the market and generated immense price pressure because they sold some of their products at less than the cost of production.

Markus Körfer-Schün is Head of Corporate Development at SMA.

In Germany too, SMA's home market, considerably fewer PV systems were installed.

MARKUS KÖRFER-SCHÜN: Yes, that's right. The numerous amendments to the Renewable Energy Sources Act (EEG) caused huge uncertainty in the German market. Annual growth fell from 7.5 gigawatts in 2011 to just 1.9 gigawatts in 2014 – a decline in volume of 75%. In these three years, SMA's sales fell from €1.7 billion to around €800 million. Despite having already begun and consistently driving forward expansion in foreign markets early on, we were not able to absorb the loss in sales of around €1 billion caused by the sudden change of direction in German policies. Despite previously introduced strategic measures, our strong international presence and high capacity for innovation, SMA reported a loss of over €160 million in 2014.

How did you then go about planning the transformation?

MARKUS KÖRFER-SCHÜN: The most important aim was to position the company more flexibly, both financially and operationally, and to adapt the cost structure to the lower sales levels that were forecasted. To do this, we had to reduce fixed costs by 40% by the end of 2015. Together with executives from different parts of the company, we prepared a comprehensive package of measures within a few weeks. Everything was up for discussion during that time – we really left no stone unturned. Fortunately, thanks to SMA's solid balance sheet and owner structure, we were in a position to achieve the transformation using our own resources. The Managing Board had already pursued an extremely conservative fiscal policy for years, thus ensuring room to maneuver in difficult times.

Mr. Naujoks, you were responsible for carrying out the most emotionally difficult task, laying off 1,600 full-time positions.

ALEXANDER NAUJOKS: In addition to the material costs, we also had to significantly reduce personnel costs. Therefore, the layoffs, which were distressing for all SMA employees, were unfortunately inevitable. To quickly meet the increasing demand in the photovoltaics boom years, we had built up our staff capacities. To restructure ourselves as a small and medium-sized enterprise, we also had to substantially reduce the size of the management team.

What was particularly important in making the layoff process quick and socially responsible?

ALEXANDER NAUJOKS: We decided to approach the layoffs by using a severance program. The close involvement of the Works Council right from the start and the open and extensive communication by the Managing Board at Works Meetings and on the intranet were crucial. We also closely cooperated with the Federal Employment Agency to be able to offer employees qualified advice from this side, too. All these measures were effective. Enough employees volunteered to leave the company and within a few months layoffs totaled 1,400 full-time positions, and were done in a socially responsible manner without any involuntary layoffs.

Alexander Naujoks is Executive Vice President of Human Resources at SMA.

How do you see the company's position after the transformation?

ALEXANDER NAUJOKS: After the transformation, we are very well positioned to retain our high capacity for innovation and continue successfully running the company, even with a reduced team. It is also crucial that we haven't changed our strategy and continue to offer complete solutions for all market segments in all the important markets, from private residential PV systems to commercial systems through to large-scale PV power plants.

MARKUS KÖRFER-SCHÜN: The share price has recovered significantly. At the end of 2015, the market capitalization, at around €2 billion, was above the value at the time of the IPO in 2008. Moreover SMA is the only remaining solar company in the TecDAX. I am particularly pleased that the Managing Board already has its sights set firmly on the future and is consistently aligning SMA with the digitization of the energy industry. The recently concluded partnerships with Tesla, Daimler and the transmission grid operator TenneT are game-changing here.

Mr. Naujoks, Mr. Körfer-Schün,
thank you very much for the interview.

POLE
POSITION

Grosse held many discussions with suppliers inspiring confidence in the new developments at SMA, thereby safeguarding material flows. Over the course of Supplier Day, he and his team managed to accomplish another critical step – to extend payment terms, thus giving SMA more room to maneuver. “Around this time, the Managing Board had also convinced trade credit insurers and investors of SMA’s unique selling propositions – that was a turning point,” recalled Grosse.

SMA also focused its efforts on its core business, reducing its real net output ratio and number of product versions. To reduce its resource-depleting, high net working capital, the company also streamlined its inventories. This vendor-managed inventory strategy is now proving beneficial. Materials remain in the supplier’s inventory for longer – which, simply put, means that SMA makes use of supplier warehouses thus creating savings. In addition, executives are pooling synergies at an international level, not just resources for Purchasing but also when it comes to Production and Development, such as between SMA and its subsidiary Zeversolar.

The management team achieved what was arguably the most difficult step – layoffs equating to close to 1,600 full-time positions – through a severance program. By the end of March 2015, enough employees had voluntarily decided to leave the company that no involuntary layoffs were needed, and the process was completed within a very short period of time.

BACK IN THE BLACK

All other measures were also quickly implemented. By the middle of the year, it was clear to the team around Terlinden, Soldner and Grosse that things were turning around. While SMA was still embroiled in its restructuring phase, demand continued to rise. The biggest goal was to consistently cater to this demand. “We had to take on this additional work with a shrinking workforce,” said Terlinden. This meant extra shifts and weekend work. “Our employees really pushed hard,” he pointed out. Soldner also described the solidarity within the company as “simply great.” But what pleased her the most was to see the employees carry on with the same motivation even in the face of difficult times. From her experience, she knows that “things can also turn out quite differently.” SMA’s unique corporate culture persevered.

Equipped for all eventualities: After the transformation, Production is even more flexible, and annual production capacity increased from 15 GW to 20 GW.

The results of the transformation speak for themselves. SMA is weathering the crisis and is not allowing itself to be ousted from pole position either. Around 80% of the savings already took effect in 2015. The break-even point has fallen by 25%. The company is flexibly positioned and is becoming profitable again, sooner than expected.

Terlinden, Soldner and Grosse are now looking expectantly to the future – and to further challenges to come. “2016 will be the first year in which we will consolidate the new structures,” said Terlinden. “We want to make even more improvements, especially in the interfaces between the various functions and in international collaboration,” added Soldner. But what pleases Grosse above all is the fact that “the company can now continue to plan and act strategically and is able to build on our successful years from pole position.”

THE PV INVERTER MARKET IS UNDERGOING RADICAL UPHEAVAL

SMA SETS ITS SIGHTS ON GREATER FLEXIBILITY AND REDUCTION OF FIXED COSTS

SMA IS EMERGING FROM THE CRISIS STRONGER AND IS BECOMING PROFITABLE AGAIN SOONER THAN EXPECTED

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