MEYER BURGER

Magazine

No. 1 2022

How sustainability shapes the company

Ecological, economic and social business activities for a fairer world. **p. 4**

Where Meyer Burger is decorative

Elegant and high performance modules look good on any roof. **p. 25**

Why a spirit of research and innovation pays off

Photovoltaics is the key energy of the future. **p. 38**

Meet Meyer Burger

From zero to 290 million, the range of numbers and facts about Meyer Burger. Each one describes a part of the journey the traditional Swiss company has taken from being an experienced PV system manufacturer to a manufacturer of state-of-the-art solar cells and modules in a short amount of time.

Team Meyer Burger

789*
Total

444
Production

170
Research & Development (R&D)

87
Sales & Service

88
Finance & Administration

17 trainees

52+
people use JobRad

* FTE: Full-time equivalent according to the 2021 Meyer Burger Annual Report

2
new production sites

2x 400 MW
solar capacity

0
grams of lead

100%
renewable energy

100 min
from wafers to solar cells

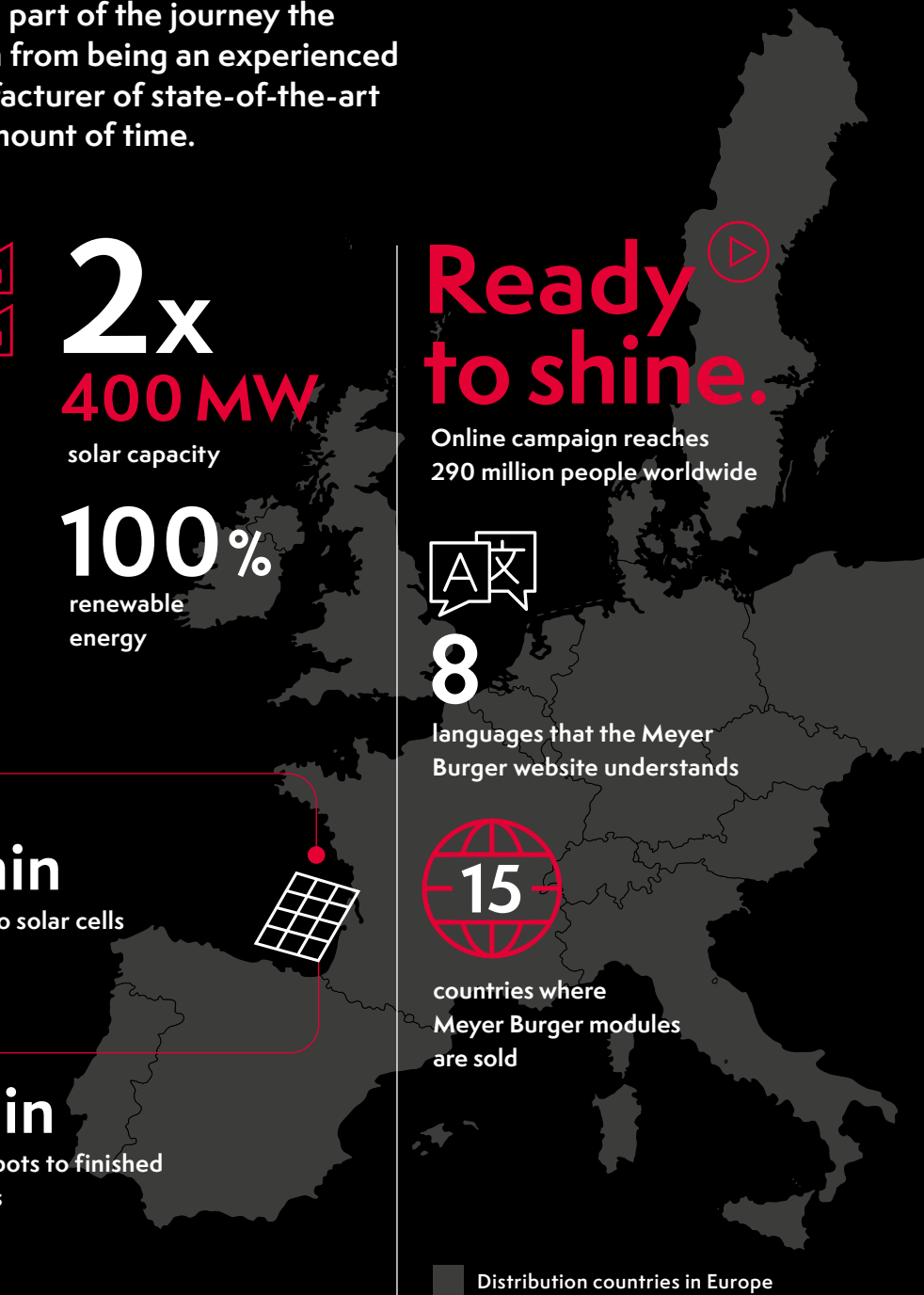
150 min
from glass robots to finished solar modules

Ready to shine.

Online campaign reaches 290 million people worldwide

8
languages that the Meyer Burger website understands

15
countries where Meyer Burger modules are sold



Distribution countries in Europe

Sites

Headquarters
Meyer Burger Technology AG & Meyer Burger (Switzerland) AG
Thun, Switzerland

Meyer Burger Research AG
Hauterive, Switzerland

Pasan SA
Neuchâtel, Switzerland

Meyer Burger (Germany) GmbH
Hohenstein-Ernstthal, Germany

Meyer Burger (Industries) GmbH, module production
Freiberg, Germany

Meyer Burger (Industries) GmbH, cell production
Thalheim (Bitterfeld-Wolfen), Germany

Meyer Burger (Americas) Ltd.,
Oregon, USA

Solar module production
Goodyear/AZ, USA

Meyer Burger Trading (Shanghai) Co. Ltd.
Shanghai, China

Meyer Burger (Singapore) Pte. Ltd
Singapore, Singapore

Dear Readers,

You are holding the very first issue of the Meyer Burger magazine in your hands. This magazine documents the company's speedy transformation. Two years ago, we set out to transform ourselves from a global leader in machine manufacturing for the solar industry to a leading module manufacturer. Today, we can proudly report that we have achieved this ambitious goal and also that our business model has passed with flying colors.

The technologies developed at Meyer Burger in Switzerland and the production systems for solar cells and modules built in Germany were put into operation in early summer 2021. At the same time, we established all supply chains and worked flat out to set up our sales organizations. We have also moved into the USA, where we will be setting up a module production facility in Arizona.

It comes as no surprise that unforeseen difficulties sometimes arise when the pace is so fast. Module production requires a lot of coordination. Moreover, there were global disruptions in the supply chains due to the Covid pandemic.

Thanks to valuable experience gained in this intensive development phase, we are optimistic about further expansion. Not only have we significantly improved processes, we have also achieved the right level of quality in our modules. The market's interest in "made in Europe" solar modules is huge and our customers have accepted our pricing.

The production of climate-friendly and competitive electrical energy is the order of the day. We're putting our money on the sun, and can provide attractive and state-of-the-art equipment for this task. Let's seize this climate opportunity together.

Gunter Erfurt
CEO

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Made in Germany

Whether it's a PV system, solar cell or high-performance module, Meyer Burger produces everything to the highest sustainability standards in Germany.

34

For the future of the planet

Through cooperation with leading research institutions such as CSEM, Meyer Burger is advancing the energy transition.

Sources: Solar Power Europe EU Market Outlook 2021 – 2025; McKinsey Energy Transition Index in pv-magazin.de (March 2022); Social Sustainability Barometer of the Energy and Transport Transition 2021/ariadneprojekt.de; diesachsen.de/wirtschaft (March 2022); Meyer Burger Annual Report 2021

Meyer Burger is supporting a solar project in Omaheke in Namibia. In doing so, we offset the CO_2 emissions generated from printing this brochure.

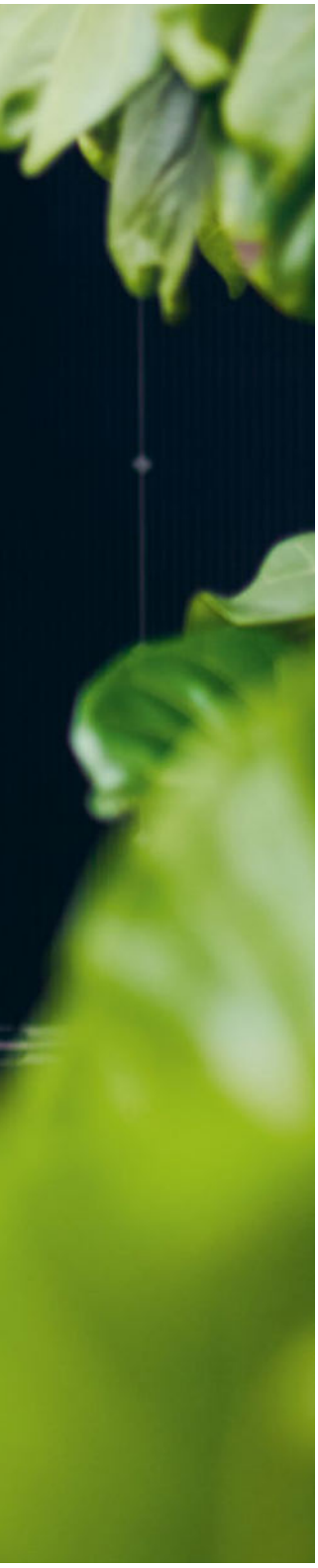
Carbon neutral
Print product
ClimatePartner.com/16833-2204-1001

A workplace with prospects

Katja Tavernaro has long since proven that she can take charge. For almost ten years, this Meyer Burger lawyer has held a senior position. In the fall of 2021, she was promoted to Chief Sustainability Officer. Whether in her role as a manager or in her private life, she lives and breathes climate protection.

If you ask Katja Tavernaro what sustainability means to her, she doesn't have to think for very long. "For me, it's about using the available resources as efficiently as possible. Because in the end, everything has to last a long time – for all the many generations that will come after us," she says. She knows exactly who she's protecting the environment for. Seven weeks ago, Tavernaro became a grandmother for the first time. This was an emotional moment for this mother of four and accomplished lawyer, and one that made it all the more clear to her why she doesn't just talk about sustainability, she lives in a resource-conscious way, both at work and in her private life. And this includes pushing for digitization within the company to avoid unnecessary printing and save paper. In her private life, Tavernaro manages a three-field farm in the heart of Saxony surrounded by 3.5 hectares of land with fruit trees, vegetable patches, grain crops and animals. On request, she brings fresh eggs to the office or sometimes homemade bread. In the summer you can find her early apples in the shared kitchen, and after work she is breeding the geese for the Christmas roast. "It's important to me that my children know where things come from and how they are connected

Sustainability is so very sweet – Meyer Burger will soon even have its own honey.



Via the beekeeper's hat and honeycombs, CSO Katja Tavernaro wants to integrate the topic of sustainability even more further into Meyer Burger's day-to-day business.

to nature. After all, meat isn't made in the freezer – just like electricity doesn't simply come out of the socket," she says with a laugh, which brings us directly to the solar industry.

Jobs with purpose in the solar industry

The company lawyer who studied in Dresden has been working for the Swiss photovoltaics group Meyer Burger for almost ten years now. From her office in Hohenstein-Ernstthal, the operational headquarters in Germany, her gaze wanders far beyond the Erzgebirge (Ore Mountains) – past wind turbines on green hills and solar panel-covered roofs in the neighborhood. Tavernaro has contributed to and speeded up the transformation of the Thun-based technology company from an innovative and globally active PV system manufacturer to an integrated manufacturer of solar cells and modules. Today, the traditional company epitomizes the future and renaissance of the solar industry in Europe. "We want to turn climate change into a climate opportunity by enabling the generation of clean energy and speeding up the energy transition," says the 44-year-old. The most important thing is to get the employees on board.

As a company, Meyer Burger can create meaning. "We offer people a job that allows them not only to develop themselves, but also to pass something on to the next generation and to the planet as a whole," explains Tavernaro. Coming from HR, her focus is always on people. In dialogue with her colleagues on the Board of Management, she is naturally also involved with processes and resources. It is important to take a close look at where the raw materials are sourced and under what conditions they are produced, where processes can be optimized to avoid environmentally harmful substances and save energy, and which waste can be recycled as much as possible. "These are precisely the issues that always at the forefront in the minds of the colleagues responsible. The more I engrain in their consciousness what it is all about and what we value, the more this will take on a life of its own and contribute to Meyer Burger's sustainability strategy and CO_2 footprint reduction."

Bringing the corporate philosophy to life

However, Katja Tavernaro is convinced that words alone are not enough to fix this thinking in our minds and hearts. It takes experience and togetherness. "With our solar modules, we have a thoroughly sustainable product – and we have people in the team who are well aware of this," says Tavernaro. Nonetheless, due to the extremely rapid growth of the workforce in the past year, we need to ensure that the corporate philosophy has been conveyed to everyone. "We want everybody to internalize that Meyer Burger is about sustainability and that we are pursuing a common goal, which means we want to do something for this Earth and limit climate change." For this reason, as Chief Sustainability Officer, Tavernaro has suggested establishing company bees at Meyer Burger. This idea is kicking off at the German locations in Freiberg, Thalheim and Hohenstein-Ernstthal. The first volunteers who want to devote themselves to beekeeping under the guidance of experienced experts have already come forward. In this way, employees can connect over a common, environmentally friendly hobby that makes our collective values visible – and ultimately edible. Sustainability can also be so very delicious. ◀

Our contribution to a better world

As a company, Meyer Burger is currently committed to implementing seven specific sustainability goals. The focus is on energy and the environment.

> **"At its essence, sustainability means ensuring prosperity and environmental protection without compromising the ability of future generations to meet their needs. A sustainable world is one where everyone can access clean energy that doesn't contribute to climate change."**

This is how former UN Secretary-General Ban-Ki Moon described the core message of the global development goals in 2015. In 17 categories, the Sustainable Development Goals (SDGs) point the way to a fairer world. The target horizon is 2030, which is not that far away.

With the implementation of the SDGs, Meyer Burger seeks to ensure that the share of renewable energies in the global energy mix is significantly increased, that the availability of electricity can be realized worldwide with new PV technologies and that a large proportion of the raw materials used are fully recycled as well as processed in a way that conserves resources. We are setting new standards in terms of sustainability and are together heading towards a livable and peaceful future.

Meyer Burger pursues these SDGs in its day-to-day operations

SDG 7 Affordable and Clean Energy

The production of solar cells and solar modules is an essential element of the PV value chain. The use of photovoltaics as the primary energy source ensures access to affordable, reliable, sustainable and modern energy worldwide while at the same time increasing the share of renewable energy in the global energy mix.

SDG 8 Decent Work and Economic Growth

As a modern company, good working conditions, gender equality and fair treatment of each other as well as our partners and customers are a matter of course for us. We promote productive employment as well as sustainable and inclusive economic growth. Our production sites are located where employee rights are enshrined in law and actively co-determined.

SDG 9 Industry, Innovation and Infrastructure

Moreover, we are actively contributing to developing a resilient infrastructure through industrial innovation and are committed to sustainable industrialization. Our goal is to support the emergence of a sustainable energy infrastructure especially in regions that are threatened with losing their energy independence. A more independent power

supply can be achieved through the use of photovoltaics. To achieve this, sustainable, and if possible regional, supply chains, which Meyer Burger is currently systematically setting up, are essential, as is stepping up investment in research and development.

SDG 11 Sustainable Cities and Communities

Sustainable municipal development is impossible without implementing innovative solar systems that are integrated into modern living concepts, emission-free transport and public infrastructure. In a strategy paper, Meyer Burger has identified numerous realization possibilities in the context of urban development and in connection with existing infrastructure, including solar house roof systems on large apartment blocks, PV roofing on freeways or as an integral part of agriculture in innovative "agri-PV" concepts.

SDG 12 Responsible Consumption and Production

Our strategic orientation is based on a production process that conserves resources and is both cost-effective and energy-efficient. Our patent-protected technology requires fewer production steps and significantly less energy than conventional solar production. For Meyer Burger, it is imperative that the products resulting from this process are not discarded but rather recycled and returned to the material cycle. In this way, the material footprint of our products is reduced to a minimum.

SDG 13 Climate Action

Solar power is the solution to some of the most pressing problems of our time. The dramatic climate crisis calls for the fastest possible switchover to a very high proportion of renewable energies. Photovoltaics promotes the emergence of new forms of energy storage, such as hydrogen or innovative battery systems for the transportation or public infrastructure sectors, for example. Solar energy is used in a variety of ways: from detached houses to commercial use and large solar parks, every single solar module is vital to reduce CO_2 emissions and stop climate change.

SDG 17 Partnerships for the Goals

Meyer Burger has been involved in numerous sustainable partnerships in the solar industry for many years, among other things as a member of Solar Power Europe (SPE), bne, BSW, Swissolar, PV Austria and Silicon Saxony. This commitment helps increase awareness of the company as a trusted European PV producer. Meyer Burger is also a member of the Ultra Low Carbon Solar (ULCS) Alliance and is committed to low-CO_2 production without forced labor (GRI 102–13).

Meyer Burger is pursuing several promising projects in the field of solar research with highly regarded scientific institutes. Our R&D teams in Switzerland and Germany work in exclusive cooperation with CSEM (Centre Suisse d'Électronique et de Microtechnique) in Neuchâtel, Switzerland. They are driving the industrialization of IBC (Interdigitated Back Contact) technology at various levels. This technology is based on our current heterojunction platform and promises further advantages in terms of solar technology resource efficiency. ◀

> **"There is no 'Plan B' because we do not have a 'Planet B.' We have to work and galvanize our action."**
>
> **Ban-Ki Moon, former UN Secretary-General**

You can make a difference here

For the energy transition to succeed, we need people who are enthusiastic about the solar industry. Up to four million jobs could be created in the solar industry across Europe by 2050. This creates many sustainable career opportunities.

If you're looking for a job with a future, the solar industry is the right place for you.

Motivated employees are the most important foundation for Meyer Burger to build on. The international team grew to just over 900 in 2021. Most of the new colleagues were hired in production over the course of the year – around 200 each in solar cell production in Thalheim and in module production in Freiberg. A major advantage was that the company was able to draw on qualified and experienced solar staff at both locations, who had often just waited for photovoltaics to finally take off again in the Saxony-Anhalt's Solar Valley as well as in the Freiberg solar site in Saxony.

Recruiting for capacity expansion in progress

Specially trained staff for production have therefore been found, and a Europe-wide sales and marketing team has also been established. In research, Meyer Burger has dozens of its own top-notch engineers, and solar engineering is also well positioned with its in-house team of experts with decades of experience.

Despite all this, recruiting continues to be of vital importance. In the coming months alone, more than 300 jobs will have to be filled to expand capacity to 1.4 GW. Moreover, a new solar module production facility is set to open in the USA, and recruitment is underway here.

"People looking for a job today don't want just any job; they are often making a commitment for a significant part of their life. We therefore offer a raft of benefits and attach importance to a modern working environment," says Katja Tavernaro, CSO at Meyer Burger and therefore also responsible for recruiting. "Sustainability is not only a central part of our company DNA, it is also practiced in everyday

manufacturing and office life. We offer modern workplaces, if possible also mobile ones, and strive to keep our CO_2 footprint low through ecological business activities."

> **"Sustainability is not only a central part of our company DNA, it is also practiced in everyday manufacturing and office life."**
>
> **Katja Tavernaro, CSO at Meyer Burger**

Portal makes the application process easier

Meyer Burger's HR team uses various channels to find the best professionals and most motivated solar workers. The media used for this range from radio, cinema and screen advertising in the supermarket to social media spots, classic print advertising and word-of-mouth advertising. With the new application portal, the Meyer Burger experience has become even more attractive and tangible for applicants. Not only can potential applicants get to know the many different sites, they can also watch videos and read short descriptions of the vacancies. In this way, they are introduced to the company and find out why it makes sense to work for Meyer Burger. To reflect the international character of the Swiss tech group, this portal is multilingual.

Recruiting is fun – and good interaction between HR officers is also reflected in the team.

"Our new application portal conveys our vision of what working in a company like Meyer Burger means in terms of added value – not just for each individual, but also in terms of climate action," says Katja Tavernaro.

The new application tool simplifies recruitment and speeds up the application process. "We call it HR 4.0 – exactly like Industry 4.0," explains HR manager Susan Herzog. In the end, it's not just the production process that is automated as much as possible at Meyer Burger, but now the recruiting process as well. In total, more than 2,000 applications were processed last year and more than 1,100 interviews were held. "But the journey doesn't stop here. The new challenges posed by the ongoing expansion in Thalheim, Freiberg and the USA can now be met digitally, quickly and efficiently," says Katja Tavernaro. What is needed are operators, technologists and maintenance staff, engineers and service staff, sales specialists and marketing experts, canteen staff and buyers.

Prospects in a dynamic industry

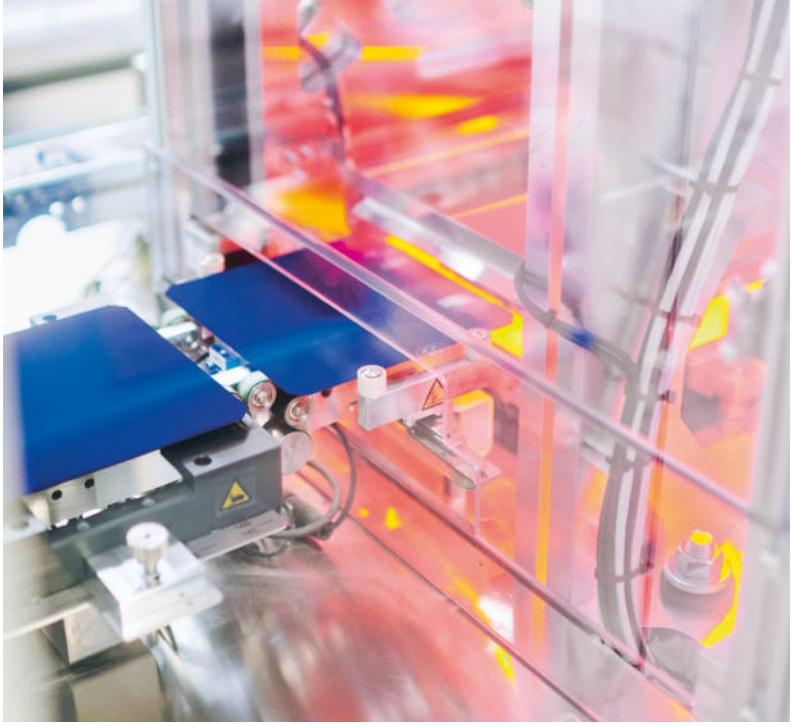
The new recruiting system is integrated into the Meyer Burger website, has an automatic reply and filter function and coordinates both external and internal application processes. Recruiting is a key task in a growing company like Meyer Burger. The aim is to make the associated processes as transparent as possible.

"Teamwork is crucial for us," says Susan Herzog. Despite all this modern technology, the recruiting team continues to rely on satisfied employees telling their friends and family about vacancies at Meyer Burger, which is the best way to directly recruit new colleagues. Web-savvy people at the company can share job ads from the new application portal on social networks, thus drawing the attention of a community interested in future topics or the energy transition to career opportunities in the solar industry and specifically at Meyer Burger.

"Participation and active, trusting cooperation are extremely important to us. Because sustainability doesn't just mean a job with prospects in a dynamic industry, but also having fun at work," says HR manager Susan Herzog. ◀

From machine to module

Mission accomplished! Meyer Burger has transformed from a global PV-system supplier into an integrated manufacturer of high performance solar cells and modules. Production currently takes place at three locations, with capacities being expanded.



Many hundreds of thousands of solar cells roll off the production line in Thalheim every day. Each one contributes to the energy transition.

Europe's largest module plant in Freiberg is in full swing. Production, packaging and shipping take place here around the clock.

Dexterity and a good eye are necessary to prepare the highly complex PV systems for transport to Solar Valley.

The Swiss technology company has been producing PV products in Saxony-Anhalt and Saxony for a year now. As is often the case, all good things come in threes: PV systems are still produced in Hohenstein-Ernstthal, but "only" for equipping our own plants. Dozens of high-tech machines are designed here in high-precision manufacturing work – both for manufacturing heterojunction solar cells and Meyer Burger-specific SmartWire modules.

The systems that are built in HOT (seen on car number plates here and affectionate abbreviation for the small town on the outskirts of the Erzgebirge (Ore Mountains) in Saxony) will sooner or later make their way onto a huge crane that loads them for transport. Most of them are shipped to Solar Valley. This is where Meyer Burger's new solar cell production is located. The almost 88,600 square feet hall was already a PV production facility at the time of the solar boom more than ten years ago. It has now been brought back to life and is currently equipped with 400 MW >

Four eyes see more than two:
In mechanical engineering as well
as PV production, Meyer
Burger counts on teamwork.

"What am I particularly pleased about? That my team here at the site pulls together so well and is incredibly committed to the job, even under the current challenging conditions."

Uwe Janetzki, Production Manager for Mechanical Engineering in Hohenstein-Ernstthal

A look at solar cell production in Thalheim. Alongside production, we are also working on capacity expansion to 1.4 GW here too.

of cell capacity. Alongside the day-to-day production, a second expansion stage soon to reach a capacity of 1.4 GW is also in the pipeline. The cells produced in Thalheim, a district of Bitterfeld-Wolfen, are an essential intermediate step in the PV production process. Many hundreds of thousands are packed daily in a rolling three-layer system and transported to Freiberg in Saxony. Production of the actual solar module will then start in the module factory located there – the largest in Europe and also roused from its slumber by Meyer Burger at the end of 2020. Here, the company also works in shifts around the clock, 365 days a year. Almost 400 new employees were hired at the two production sites last year, and nearly 2,000 hours of qualification and further training were carried out to get PV production up and running again. Several thousand modules roll off the production line in Freiberg every day, where they >

For me, solar is...
Being part of the energy transition and manufacturing the products it needs.

This makes us proud...
Being involved in the relaunch of solar cell production in Germany and helping to shape the construction of the production site from the very beginning.

This is what's special about Meyer Burger...
That we produce state-of-the-art systems for PV production in our own company and then produce the best solar cells in the world.

This motivates me...
Our team, a great mix of experienced solar workers and professionals from other industries with a great sense of togetherness. In the course of the current capacity expansion, we are all looking forward to many new colleagues joining us to be part of the energy transition.

I wouldn't have dreamed this a year ago...
That I can continue to implement my vision of using photovoltaics to supply our society with energy in the Bitterfeld region, where I live with my family.

Jochen Fritsche, Production Manager
Solar Cell Production in Thalheim

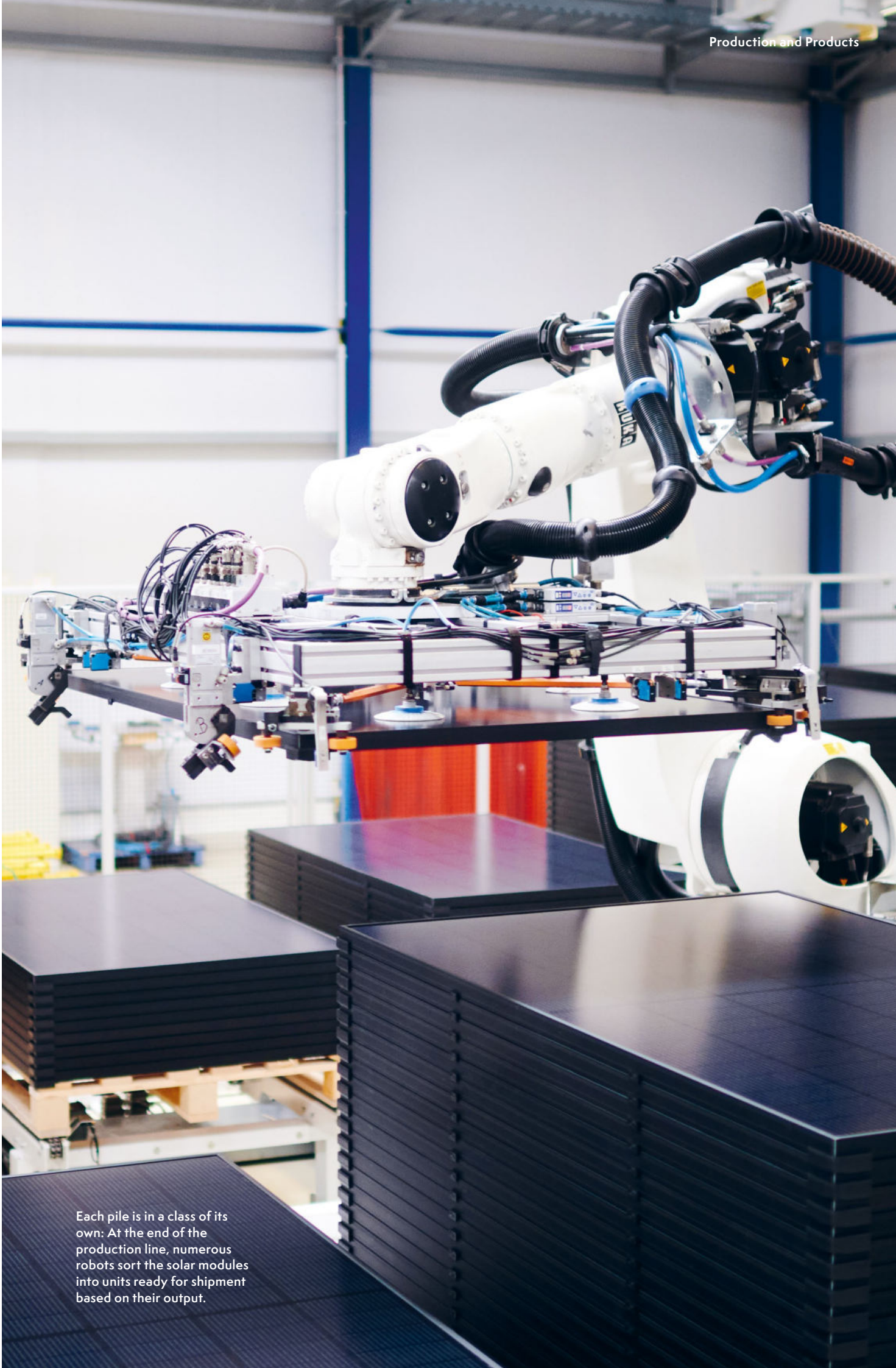
Man and machine work together in module production in the most effective way to guarantee the best quality.

Ronald Müller poses again for this photo at the very spot where module production was launched exactly one year ago, amid a lot of media attention.

"2021 was a very successful year that motivated us to look ahead. We set up a great team at the site, which produces state-of-the-art production systems around the clock."

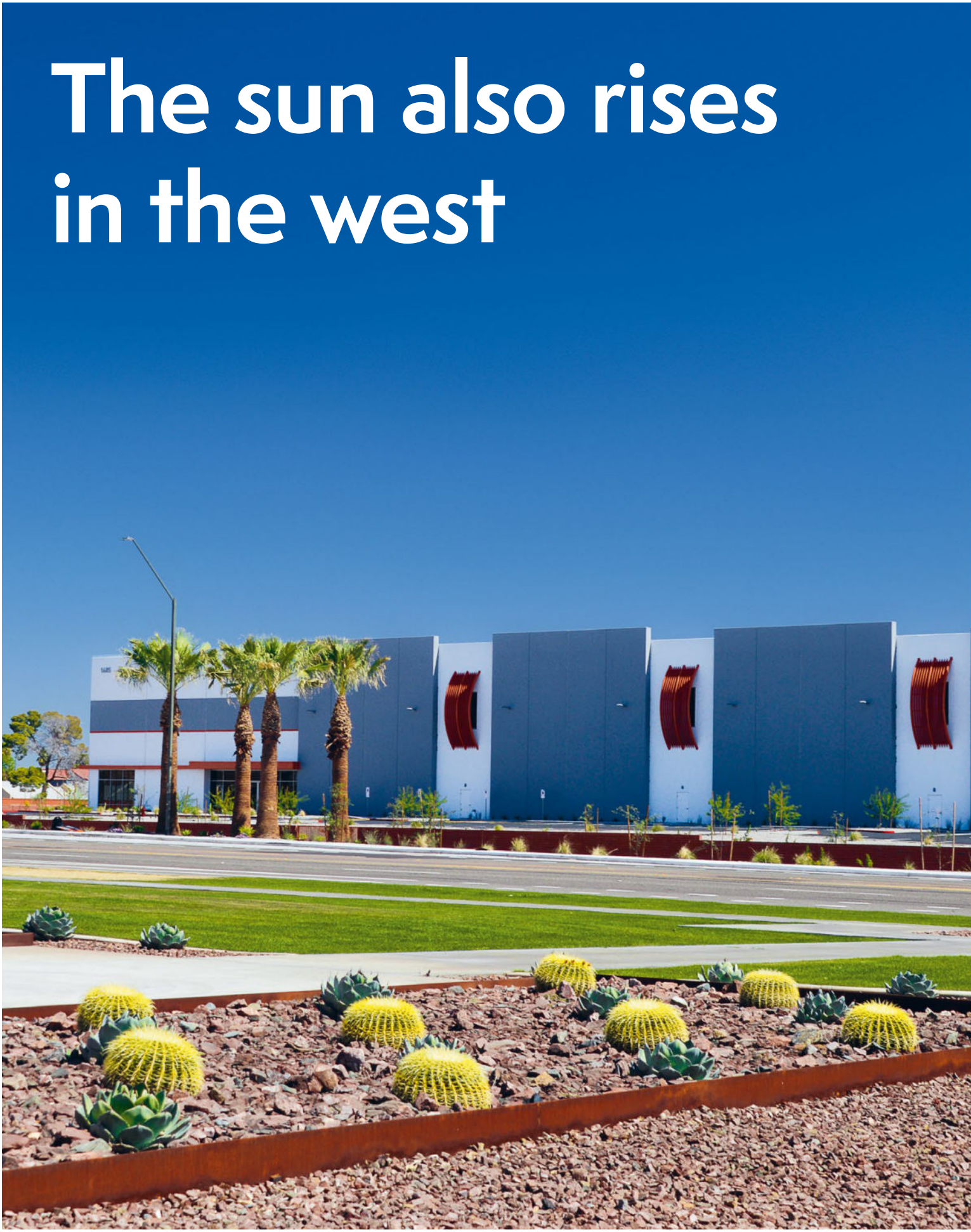
Ronald Müller, Head of Module Production in Freiberg

alternate between white and black backsheet modules and glass-glass modules on a weekly or monthly basis. Alongside manufacturing, production capacity is being expanded next door. Some of the machines – in particular the core components of the SmartWire technology, which are continually optimized with Swiss research know-how – are also manufactured in Hohenstein-Ernstthal. This is how Meyer Burger's triad of machine, cell and module works true to the motto: Made in Germany, designed in Switzerland for a bright future. ◀



Each pile is in a class of its own: At the end of the production line, numerous robots sort the solar modules into units ready for shipment based on their output.

The sun also rises in the west



In the USA, Meyer Burger is setting up its new module production facility in the Valley of the Sun.

So this is Meyer Burger's new location in the USA – Goodyear in Arizona. With a population of 95,000, this city on the outskirts of Phoenix is one of the sunniest in North America. The sun shines here nearly 3,900 hours per year. Truly an ideal place to manufacture solar modules.

The setup and expansion are in full swing. As soon as possible, the hall leased at the end of December 2021, which was originally built as a logistics building, will be converted into a solar production facility. In addition to office and storage space, this also requires rooms for maintenance and IT as well as ample space for dozens of machines for production and automation. "We must now fill the large empty shell with everything that is required for solar module production," explains Ringo Thiel, Head of Project Management at Meyer Burger, who is responsible for implementing the US project. The 41-year-old project manager from Leipzig has many years of experience in the solar industry and is confident that Meyer Burger will soon be able to expand to America.

"Our proprietary heterojunction cell technology and patented SmartWire module technology enable us to produce economically competitive products of the highest quality and performance."

Gunter Erfurt

The schedule is ambitious. The first machines are scheduled to be shipped to the USA in the late summer. Some of them will be assembled in Meyer Burger's own machine production facility in Hohenstein-Ernstthal. In the fall, the construction of the first line will begin around 5,700 miles further west. At the beginning of 2023, the first solar modules are scheduled to roll off the production line in Goodyear. The annual production capacity will initially be 400 MW. These solar modules "made in the USA" will primarily be installed on private roofs. Next up, >

Our man in Arizona: Walter Gisler is already on site as a solar professional with experience.

Goodyear's municipal administration and local economic promotion were important partners in the search for a location in the USA.

With 3,900 hours of sunshine a year, Goodyear is one of the sunniest places in all of North America.

commercial and industrial rooftop systems will become the focus of sales. Modules specifically for solar parks will be manufactured in Goodyear at a later date. A total of 1.5 GW of nominal annual capacity is planned at the new US site.

At first, the solar cells for module production in Goodyear will come from Meyer Burger's cell production in Thalheim in Saxony-Anhalt. In Solar Valley, production capacity is currently being expanded to 1.4 GW to supply both module locations – the one in Freiberg in Saxony and soon the one in Solar Valley as well as Goodyear – with high-performance solar technology based on heterojunction technology. The journey from Solar Valley to the Valley of the Sun takes over 16 hours. Nevertheless, there is a close bond between these far-flung locations in the east and west.

For example, Meyer Burger relies on experienced staff from the plants in Germany and the traditional sites in Switzerland, that were just set up last year, to also oversee production in Goodyear. In total, almost 100 employees from all sites around the world expressed their interest in supporting this ramp-up in the USA. Recruitment is underway for these strategically important functions. Ringo Thiel's project team consists of five PV experts: Walter Gisler, a solar professional with site experience, who is based in Arizona, and Ardes Johnson. Johnson manages the US sales team from Texas, which has been driving forward the sale of Meyer Burger modules in the states for months. A total of 500 jobs will be created in Goodyear, Meyer Burger's first production site outside Europe.

"We must now fill the large empty shell with everything required for solar module production."

Ringo Thiel, Head of Project Management at Meyer Burger

Huge expansion potential in the US market

To speed up the ramp-up, Meyer Burger is striving for long-term purchase agreements with large project developers, independent electricity producers and energy suppliers, who at the same time are making a financial contribution to the investments required for the expansion at Meyer Burger. To this end, the company signed a letter of intent with a major US developer and operator of renewable energy systems in March 2022. This non-binding letter of intent provides for a multi-year purchase agreement with a total volume of several GW.

The investment underlines Meyer Burger's strategy of producing modules close to end customers, building regional supply chains and improving overall sustainability by reducing transport emissions and optimizing the company's CO_2 footprint. Establishing production in Arizona offers Meyer Burger customers faster and direct access to solar modules in the growing North American market, making them less dependent on imports, and is crucial for achieving climate goals in the USA – and worldwide. ◀

Sunny outlook

Rarely before has the solar industry experienced such an upswing as it is seeing now. The last peak was a decade ago, but in times of crisis, solar energy is considered particularly sustainable, and even peace-building. To expand the EU's energy self-sufficiency, more than one terrawatt of PV systems must be added by 2030.

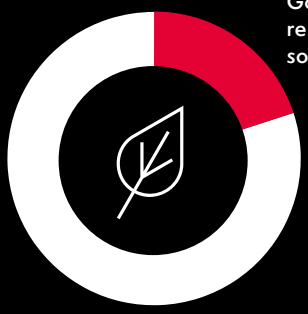
Photovoltaics target figures in Germany

200 GW
2021 (59 GW)

Expansion plans for PV in Germany by 2030

4.7x

necessary speed-up in the expansion of photovoltaics in order to achieve the 2030 target



Gross electricity demand in 2030: 680 – 750 TWh

1,600
Saxony (DE)

1,610
Saxony-Anhalt (DE)

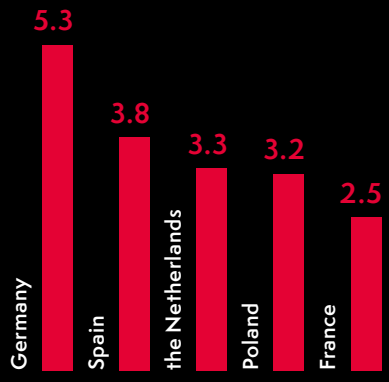
Hours of sunshine a year (2021)

1,805
Baden-Württemberg (DE)

1,862
Bern (CH)

The 5 largest solar markets in Europe in 2021

Growth in GW



3,924

Goodyear, Arizona (USA)

June is the sunniest month of the year, with an average of 407 hours of sunlight.

2,858

Marseille (FR)

2,524

Barcelona (ES)

2,347

Amsterdam (NL)

2 million

More than 2 million PV systems with an output of 59 GW are currently installed in Germany. In 2021, photovoltaics delivered a total of 51 terrawatt hours of electricity, covering 9.1% of gross electricity consumption in Germany.

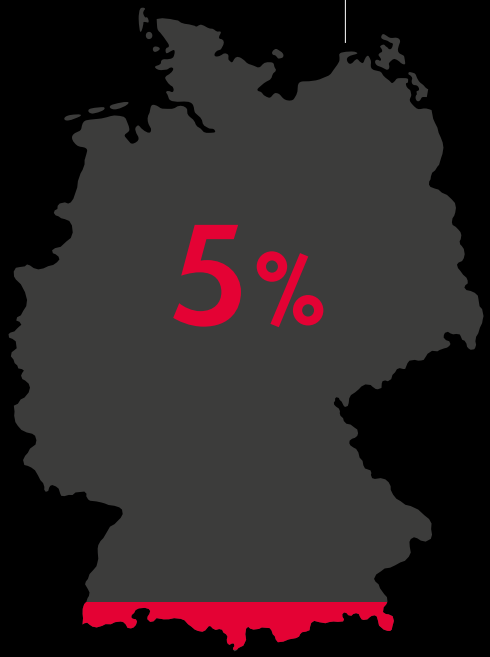
PV systems (1 unit = 50,000 PVA)

492

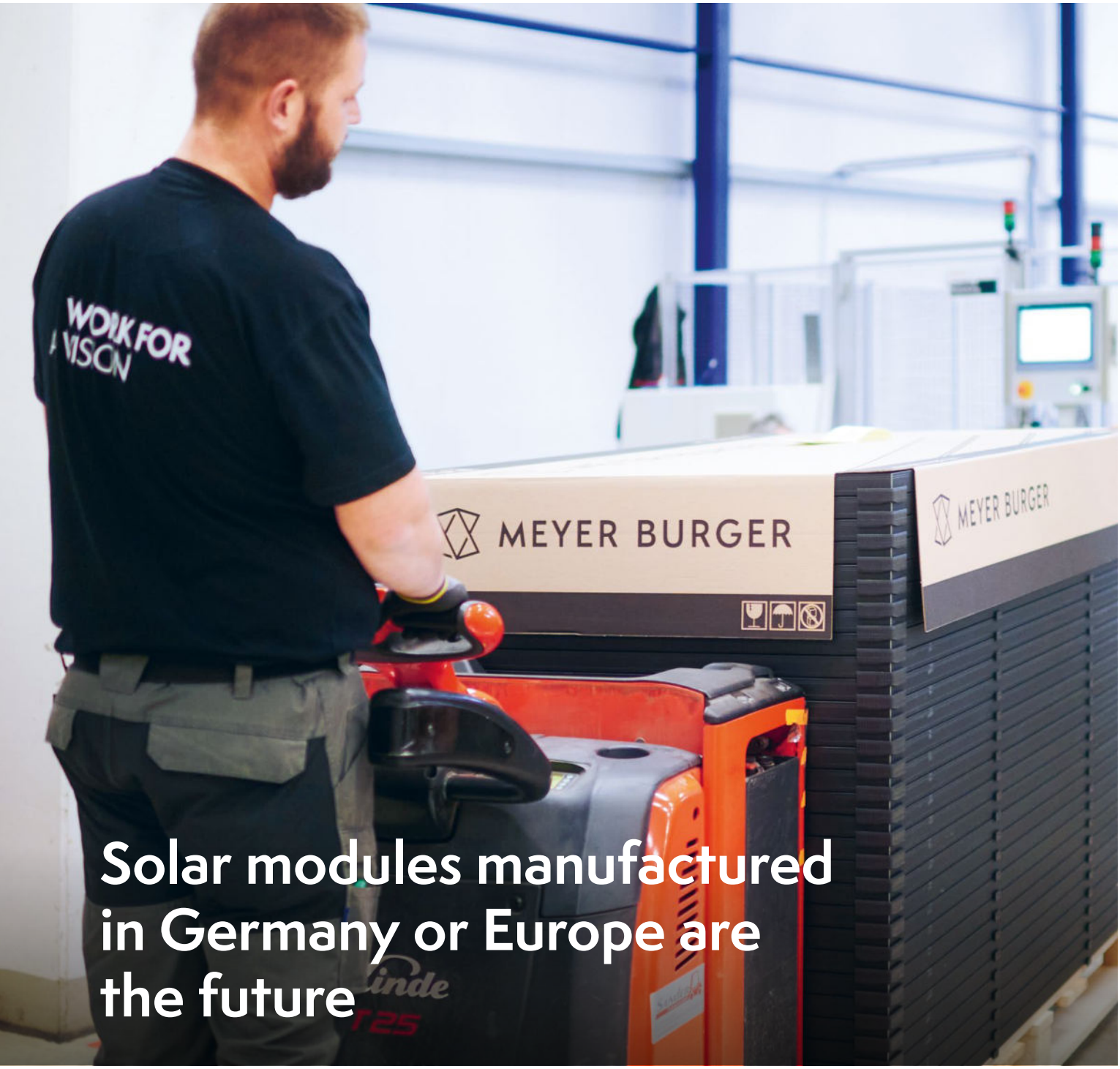
Number of installer companies registered with Meyer Burger

>40

wholesalers distributing Meyer Burger modules



5% of the area of Germany would be sufficient to cover the PV demand. In order to generate 3,400 GW of solar energy, an area of around 10,563 square miles is required.



Solar modules manufactured in Germany or Europe are the future

The solar modules roll off the production line at Meyer Burger in Freiberg, Saxony.

There is a lot to boast about in advertising: unique performance, durable high-performance modules, environmentally friendly production. But what exactly makes Meyer Burger's technology so relevant? And why is solar power sustainable? We discussed this with Dr. Harry Wirth, Head of Modules and Power Plants at the Fraunhofer Institute for Solar Energy Systems (ISE) in Freiburg.

"In Germany, sun and wind are the perfect partners. "Looking at the month, day and hour, they often complement each other perfectly."

Dr. Harry Wirth, Head of Modules and Power Plants at the Fraunhofer Institute for Solar Energy Systems (ISE)

Does Meyer Burger have a head start over its Asian competitors with heterojunction technology?
In Asia, there are well over 100 GW of PERC production capacity. Switching from PERC to heterojunction (HJT) is technically very complex and requires completely different production facilities. Experts agree, however, that HJT already has more potential than PERC in rated power, even with optimized contact passivation. In the end, performance is what counts, with HJT making further gains.

How can the technological advantage of HJT be described compared to PERC?
As powerful and sustainable. During operation, things usually get hotter than in a standard laboratory test, where small temperature coefficients count. The topic of sustainability is rapidly gaining in significance for investors. Increased performance also means a more efficient use of materials. In addition, there is the topic of lead. Where comparable modules contain around 15 g of lead, HJT can completely dispense with lead. With HJT, lead-free variants are used for both solder and metallization pastes. This is an advantage in terms of environmental friendliness.

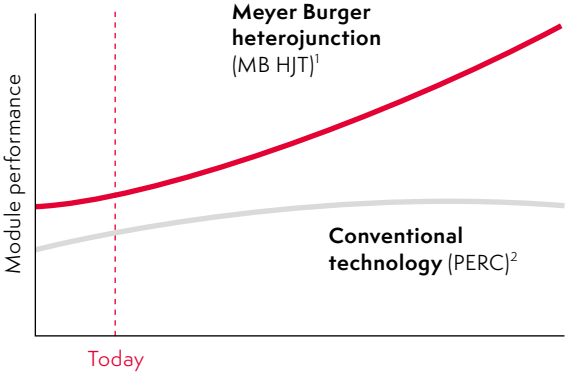
How do you envisage testing different solar technologies at your institute?
Certification tests provide the basis but they do not allow for any differentiation in performance and reliability. Benchmarking, on the other hand, involves different technologies competing directly against each other in precisely measured environments. Comprehensive benchmarking combines targeted accelerated tests in the laboratory with monitoring in actual operation. In particular, laboratory tests with combined loads quickly separate the wheat from the chaff.

Can the German or European solar industry hold its own against the competition from the Far East in the long term thanks to its current technological edge?
We believe this will be the case. High-tech products, automation and rapid scaling of production, with a firm focus on the sustainability of the products are the name of the game and will decide who comes out on top. Demand in Germany is currently exploding. This should also make it possible to strengthen or rebuild the local supplier industry.

Why is producing photovoltaics a competitive advantage in Europe?
PV is inherently a green technology but buyers today are digging deeper. They are asking about CO_2 footprint and clean factories, social standards and governance. Europe promises top marks in terms of ESG, and ESG will also be monetized and regulated more strongly in the future. After all, the CO_2 footprint of the entire value chain is what counts. A company that produces in a region with a high proportion of renewable energies and short transport routes is in the lead here. When goods travel halfway around the globe, transport costs already account for a growing proportion of the total costs.

How do you assess the PV potential in Germany –in other words, how much of the German electricity demand could realistically be covered by solar energy in the future?
My colleagues at Fraunhofer ISE are modeling the future, 100 % renewable-based energy system. The most important primary energy sources by far are wind and solar energy, and this is no different when looking at the rest of the world. >

3-year technological leap



Meyer Burgers HJT technology[1] is already highly efficient today and has further optimization potential as a platform technology

[1] Including SmartWire module technology;
[2] Passivated emitter and rear cell
Graphic: Meyer Burger

Where does PV have the greatest effect? On as many small roofs as possible? Or over a large area, such as in solar parks? And what multiple uses are already feasible and useful today?

The climate crisis does not give us time to try out options one after the other or to be picky. In view of the enormous need for expansion, we must promote all possibilites at once. Integrated photovoltaics is ideal for keeping land consumption low or avoiding it altogether. It can be found in coverings, for example of buildings, vehicles, parking lots and roads, as well as on agricultural land already in use and man-made lakes.

What kind of back-up technology is needed for times when the sun isn't shining?

In Germany, sun and wind are the perfect partners. Looking at the month, day and hour, they often complement each other perfectly. Nevertheless, gaps remain, quite often for hours, and very rarely, during the winter, for several weeks. For the large gaps we need green hydrogen, the small ones can use load shifts, for example when charging electric vehicles and heat accumulators, as well as with bidirectional accumulators such as stationary batteries and pump accumulators.

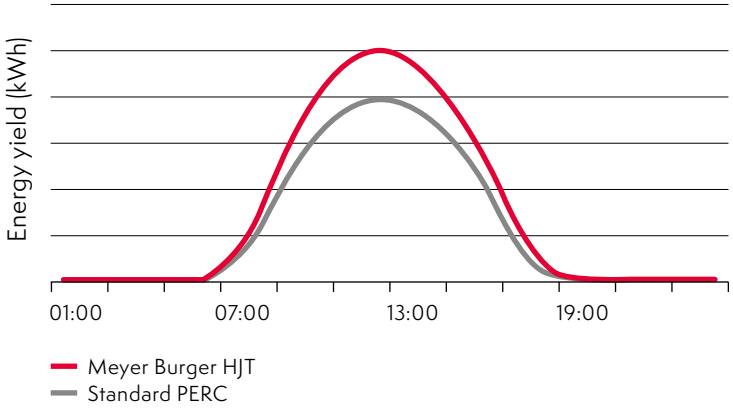
What energy mix do you think is sustainable and acceptable?

Essentially solar and wind as primary sources of energy, with certain amount of green fuels as well. Also small amounts of biogenic residues, such as pellets.

Due to the recent dramatic developments in Europe, solar energy, like wind power, has lately been regarded as an energy of freedom – or even peace. Would you agree and does this endorsement add extra value to these renewable forms of energy?

Absolutely. The political costs of high energy dependence can be distressing when autocratic states collect fees at the other end of the line. But hardly anyone was interested as long as the problems were only simmering at the gates of Europe. The use of renewable energy could even free economies from the so-called curse of raw materials, which perpetuate extreme inequality, corruption and dictatorship in many countries. ◀

Meyer Burger's Heterojunction (HJT)



0.20%
Very low degradation
Long product life and absolute longevity thanks to gentle production processes

–0.26%
Minimum temperature coefficient
for more performance even in very hot regions

Naturally bifacial (90% factor)
Use of sunlight from all sides

>24%
Increased yield thanks to an optimal use of sunlight

Graphic: Meyer Burger

Your roof is looking good

Meyer Burger has been producing solar modules in Germany since last year. The focus for their use is currently explicitly on roofs – from detached houses to historic courtyards and football stadiums. On the following pages, we show a selection of reference properties and let building owners, installers and dealers have their say as to why they explicitly chose Meyer Burger. →

Europa Park Stadium

Freiburg, Germany

The installation of the solar power plant with Meyer Burger modules on the stadium roof will begin in May.

The Freiburg SC stadium will be equipped with a solar power plant on the roof. From May 2022, the project will be implemented under the leadership of badenovaWÄRMEPLUS, the energy and environmental partner of the Bundesliga club. Meyer Burger supplies over 6,000 of its latest generation of high-performance solar modules for this purpose. In the future, around 2.3 million kilowatt hours of solar power will be produced on the over 49,000 square feet stadium area. With a peak output of 2.4 megawatts, the system covers the forecast energy requirements of the Breisgau football team. And all this without CO_2 emissions. The construction of this state-of-the-art solar power plant shows that the energy transition, climate action, sustainability and top-level sport are a perfect match. ◀

"To meet both the high sustainability standards of the city of Freiburg and the sports club as well as our own standards, we deliberately use high-performance modules manufactured in Germany."

Heinz-Werner Hölscher, Member of the Board of Management of badenova

Good neighbors

Muhen, Switzerland

Install date
09/01/2021

Product
MEYER BURGER WHITE

Number of modules
29 á 380W

Alignment
75° south-east/
115° north-west, tilt 10°

Capacity
11.02 kWp

Usable area
190 square feet of flat roof

The Graber family next door were the first customers on whose house the Swiss solarteur Adrian Wyssbrod installed Meyer Burger modules.

"Why did I choose Meyer Burger modules? They're simply beautiful. And also a real Swiss-German product with local know-how and 'made in Germany' quality. Short distances, good product features. This also wins over my customers. I built the first new system on my next door neighbor's roof with Meyer Burger White."

Adrian Wyssbrod, Managing Director of WYSolar GmbH

Strong as a team

Leipzig, Central Germany

> **"As a company, we attach great importance to sustainability and regionality in our solar products – and Meyer Burger's production is located in Germany."**
>
> **Michael Stein, Field Sales Team Leader at Memodo**

Whenever possible, Petra Schmigalle and Michael Stein go on the road together. "From a manufacturer's point of view, I can explain a lot about our solar modules – their performance, sustainable production and special looks," says the salesperson who works for Meyer Burger in eastern and north-eastern Germany. If anyone wants to know more about the big picture, Petra Schmigalle hands the reins over to her colleague. "We are experts in complete PV solutions and want to serve our customers with everything that contributes to the energy transition," says Michael Stein. In addition to solar modules, substructures and inverters, the central elements of a PV system also include storage systems, heat pumps, wallboxes and electrical accessories. "With us, the customer gets everything from a single source. The installers appreciate this," says Stein. In December 2020, the 32-year-old started his career in sales at Memodo, one of the leading photovoltaic wholesalers in Germany. He is now one of three team leaders who together manage more than 20 sales representatives in Germany. ◀

Michael Stein and Petra Schmigalle go the extra mile for their customers every time.

The elegant black modules from Meyer Burger Black are very popular with PV customers in Poland.

Active throughout Europe

500 solarteurs in 14 countries

Solarteur Michał Kitkowski is one of Meyer Burger's many international PV partners.

From Aarhus to Valencia, Gran Canaria to South Tyrol and Sligo on the Irish coast – Meyer Burger is available everywhere. Within one year, almost 500 installers and over 40 wholesalers were acquired across Europe, who offer these "made in Germany" modules with great enthusiasm. Quality, performance and sustainability are what count for them. Meyer Burger currently sells in 14 countries in Europe and the USA. Practically every week, sometimes even every day, new alliances are formed and business relationships sealed. At the beginning of the year, SunSol from Gdansk, Poland, joined the extensive list of European installers. The PV company from Gdansk, Poland, has been active in the field of rooftop and industrial systems for many years and is now starting to sell solar modules made in Germany. The first property was already completed in March, and many more are to follow.

"Meyer Burger is undoubtedly a premium manufacturer, so becoming a partner requires a similar aspiration. SunSol customers are aware that the selection and high-quality components contribute to a shorter return on investment as well as environmental protection."

Michał Kitkowski, CEO SunSol

“In the right hands”

Meyer Burger is a European innovation leader in the solar sector. The research and development team at the headquarters in Thun integrates scientific research and development into industrial series production. Currently, the next generation of modules is being created alongside a solar roof tile as robust and durable as a traditional stone tile.

The next generation of modules is called IBC. As project manager Rainer Grischke from the Research & Development team at Meyer Burger in Switzerland explains, “IBC stands for Interdigitated Back Contact. In IBC modules, the wiring is mounted on the back of the cell, which enables better use of sunlight. Especially in combination with our SmartWire technology, there are significant advantages in terms of efficiency and costs,” says “Mr. SmartWire” Rainer Grischke. He comes from the area around Hanover and studied electrical engineering at the University of Kassel. After his studies, he went on to work at the Institute for Solar Energy Research in Hamelin. Under the motto “always follow the sun,” he later emigrated to Canada where he joined a pioneer in SmartWire technology in Vancouver. The company later went bankrupt. The reason was obvious to him: The connection concept of the cells was great, but the machines were inadequate. Grischke returned to Europe. He approached Meyer Burger. “When I saw the machine production in Thun, I knew that the concept was in the right hands here,” he says. That was in 2014.

A lot has happened since then. SmartWire and heterojunction cells are standard in Meyer Burger’s module production. In Thun, it’s now all about IBC. The performance of the cell can be significantly increased again to 25.5 percent and thus also the efficiency of the modules. In the first development phase for the upcoming industrialization, the so-called FUMO, that is, the individually and manually built functional samples, provide essential knowledge.

Two machines developed in Thun play a key role at SmartWire in conjunction with IBC. One accurately places and sticks micro-wires next to each other on foil, which is then applied to the cell. The other connects a defined number of cells to form a chain. “In industrial mass production, throughput is the major challenge, namely to achieve the precision required for perfect connection of the wires at high speed,” says Rainer Grischke.

Grischke is thrilled with the finished product. “The uniform dark blue without wires and silver fingers looks very attractive – this will be a top module, especially for facades.” The inner values of the IBC modules also speak for themselves. The smart, small-scale wiring requires much less silver, which saves costs and scores points in terms of sustainability. The same applies to cell production; in this area, the team from Meyer Burger Research, which is based in Neuchâtel, succeeded in reducing the process steps and thus costs and energy consumption.

An additional advantage of Smart Wire: The wires that collect the current generated in the cell do not have to be conventionally soldered, but rather can be “baked” in the laminator at comparatively low temperatures. In combination with the sensitive heterojunction cell, this makes the modules more robust and durable. Durability is a key goal of research. After all, the modules are expected to provide >

Scrutinizing looks: In the research department in Thun the highest level of expertise meets the highest possible accuracy.

"When I saw machine production in Thun, I knew that the concept was in the right hands here."

Rainer Grischke, Project Manager Research & Development Team

For 69 years, Meyer Burger has been supplying cutting-edge technology

1953
Hans Meyer & Willy Burger founded Meyer Burger, which specialized in machines for the watchmaking industry

1970
Entered the semiconductor industry

1981
Entered the solar industry

2002
Launched the first DS262 wire saw for the solar industry

2006
IPO on the SIX Swiss Exchange on November 23, 2006

2008
Started developing hetero-junction technology

2013
Started developing SmartWire (SWCT®) technology

2016
Introduced the mono wafer standard with the DW288 series diamond wire saw

2017
55 GW of installed PERC capacity achieved worldwide

2019
Started developing HJT perovskite tandem cells and modules

2020
Acquired existing production facilities for cells and modules in Saxony and Saxony-Anhalt

2021
Strategic transformation into a cell and module producer

2021
Opened the first 400 MW heterojunction/SmartWire solar cell and solar module production facility

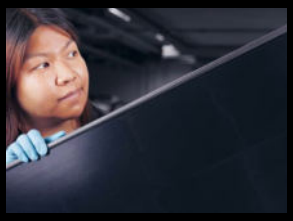
2021
Relaunch of Meyer Burger as a premium solar module brand, sales launch of the modules

2021
IBC module, developed together with CSEM, achieves an externally confirmed efficiency of 24.7% in the laboratory

Expected milestones

2022
Expanded production capacity to 1.4 GW/year, including a second module factory in the USA. Entered the commercial, industrial and solar power plant segments

2023
Sales launch of the roof-integrated high-performance solar system with solar roof tiles



2023
Launch of the IBC modules (Interdigitated Back Contact) with wiring on the back of the cell for better use of sunlight.

reliable power for 25 to 30 years, or more. During installation, all materials used are evaluated and approved in terms of performance, durability and safety. With glass, for example, what counts is the appearance, the coating, the resistance and the stability. In several test series, the materials are subjected to × times the stress specified by the industry standard IEC in order to determine the degradation. "In the future, a 40-year warranty will be standard," explains Grischke.

The new product: Solar roof tiles

The first sample roofs with the new solar roof tiles are already planned for this year, and Meyer Burger intends to offer a roof-integrated high-performance solar system from its own mass production starting in 2023. Meyer Burger acquired the rights for the special PV product a year ago from an engineering service provider from Germany specializing in innovation in the fields of photovoltaics and electromobility. There is huge potential for photovoltaics on roofs, because standard modules are often unsuitable for various reasons. "Our heterojunction/SmartWire technology combined with a sophisticated system solution makes a unique product possible," promised CEO Gunter Erfurt at the product preview at Intersolar last October.

Meeting this promise is now the task of the Research & Development department in Thun. The objectives are clearly defined: Solar tiles need the full functionality of a conventional roof tile, and should also be as easy to install. The overlap of the solar tiles must be variable to match the roof pitch. In addition, the solar tile should be as robust as a conventional roof tile, which means that it must be able to withstand being walked on, wind, weather, hail and possibly fire; it's also important that you can combine it with conventional tiles. All materials are tested to ensure they meet the standards of conventional roofing tiles – over a time span of several decades.

"Installing photovoltaics in a tile measuring just 0.3 square feet is challenging due to its small size, and more complex than is the case with large-scale standard modules measuring 5.9 square feet," is how Project Manager Cyrill Guntern puts it. The small development team is testing how cells from Meyer Burger's standard production can be used for the solar tiles as well as how the cells and SmartWire wiring need to be adapted.

"We are developing a very compact and highly efficient product that delivers solar power yet is fully tailored to the needs of the traditional working methods of roofers."

Cyrill Guntern, Project Manager

Every detail in the manufacturing process is also assessed in terms of costs. In addition to efficiency and quality, the financial outlay in production is the decisive factor for a competitive product. Since tiled roofs vary from region to region, new formats will also be developed in the near future and color technologies evaluated that will have the least possible impact on energy efficiency. "We are developing a very compact and highly efficient product that delivers solar power and yet is fully tailored to the needs of the traditional working methods of roofers," Cyrill Guntern notes. ◀

“We have to hurry”

The CSEM in Neuchâtel, with its distinctive solar facade is itself an eye-catching attraction in the city.

Professor Ballif and his team are researching the solar technology of tomorrow and beyond.

Professor Christophe Ballif is Director of the Sustainable Energy Center at CSEM (Centre Suisse d'Électronique et de Microtechnique) in Neuchâtel, Switzerland, and an expert in highly efficient photovoltaics. We spoke to him about Meyer Burger, efficiency increases and solar power plants in outer space.

Christophe Ballif

Christophe Ballif joined CSEM in 2013. He is Director of the Sustainable Energy Center at the Centre Suisse d'Électronique et de Microtechnique and the PV Center in Neuchâtel, Switzerland. The center specializes in the industrialization and technology transfer of solar energy, including solar power management and storage.

Ballif is also a professor at the University of Neuenburg and head of the laboratory for photovoltaics and thin-film electronics at the Institute of Microtechnology (IMT). He completed his studies in physics at EPFL Technical University in Lausanne in 1994. He is (co-)author of more than 500 journal and trade articles as well as several patents. In 2016, he received the Becquerel Prize for his contributions in the field of highly efficient photovoltaics.

Is Europe still the leader in solar research?
We have excellent scientific and technological research centers in Europe, and we must take advantage of that. But we have to hurry. It is important that we rebuild a European PV industry, because competition with Asian companies is fierce when it comes to industrialization. Meyer Burger's efforts here are essential and must be supported.

What is the nature of the cooperation between CSEM and Meyer Burger?
Either we propose innovative solutions and approaches or we help Meyer Burger solve concrete issues. We have been working together since 2008. Working with the EPFL Technical University at the time, we began a technology transfer of new processes for manufacturing silicon heterojunction solar cells. In 2013, we founded the Swiss Photovoltaic Center at CSEM, which is more focused on industrialization. Meyer Burger was one of our first partners.

Why is Meyer Burger so successful in translating research findings into industrial production?
The company was strictly a machine builder but with in-depth knowledge of the processing and operation of pilot lines at a high level. The fact that Meyer Burger is now using this know-how to produce its own modules is a smart move. It is necessary to have production in Europe and the USA and to develop a new supply chain for this very important energy source in Europe.

Today, Meyer Burger's modules are 21 to 22 percent efficient. With IBC, this efficiency can be increased to 24 to 25 percent – what's happening next?
Together we developed a laminate with an efficiency of 24.7 percent, which is a record. However, there is still a long way to go before we can produce fully commercial modules with an efficiency of 25 percent. The physical limit of silicon solar cells is around 29 percent, and there are various electrical and optical losses that cannot be completely avoided in a module.

Perovskite should make the modules even more efficient.
Perovskite has remarkable potential for additional improvements in efficiency. The concept is to combine a perovskite solar cell with a silicon cell. At the laboratory level, we will soon achieve efficiencies of more than 30 percent. But commercial mass utilization is still a long way off today – both in terms of established industrial processes and the desired reliability.

What are the features of Perovskite?
A crystalline solar cell is an almost perfect solar cell in the sense that it absorbs almost all photons from blue to infrared. However, blue and green photons are not used optimally, although blue photons can release a lot of energy. Perovskite is able to make much better use of the blue and green part of the spectrum and allows the infrared light to pass through. Moreover, perovskites can supply almost twice the voltage of a silicon cell, but only about half of the current. It is therefore best to combine them in multiple solar cells. The most energy-rich light is absorbed in the perovskite and the infrared light is absorbed in the silicon. Another advantage: Perovskite >

> **"We have excellent scientific and technological research centers in Europe, and we must take advantage of that. But we have to hurry."**
>
> **Christophe Ballif, Director of CSEM**

So this is what the new perovskite cell looks like. Prof. Ballif promises that it has remarkable potential for further increasing efficiency.

can be easily synthesized from readily available materials, so there is no supply risk involved.

How much can the light yield be increased?

By combining materials such as gallium arsenide (GaAs), three, four, five or even six solar cells can be stacked on top of each other to achieve efficiencies of over 38 percent. However, these materials and their deposition techniques are very expensive, typically by a factor of a thousand compared to a silicon cell. Today, they are mainly used in outer space or for military applications, such as drones.

Will it be possible to generate solar power in space?

Yes, the idea to install huge solar stations in space, convert the electricity into microwaves, and beam the power back to Earth around the clock is out there. But we still have countless technical challenges ahead of us to make this happen.

Back to Earth. In many regions of Central Europe, solar energy can cover the energy demand in summer, but not in winter. What should we do?

Even though we have more sunshine in summer, you can still generate a lot of solar energy in winter. There is nothing wrong with installing more solar panels to have more energy in winter, as well as reducing production in summer or using them to manufacture chemicals. We have enough space for solar energy, which is 30 to 100 times more efficient than biomass, for example. We can also use unusual surfaces, such as in parking lots, on harvesting machines, over roads and in fields or lakes. At the European level, wind and solar power complement each other perfectly, so there is a good balance throughout the year.

How can large-scale solar power be stored?

Batteries will play an increasingly important role in saving it for a few hours or days. Stationary batteries at home or in the grid or batteries in the car will enable us to operate the grid stably. In Switzerland, we can also rely on hydropower for seasonal storage and pumped storage power plants for short-term storage. Another option is to heat underground or water tanks in summer and use this heat in the winter. This works for large buildings, but also for small ones with the help of a reversible ground source heat pump. Finally, hydrogen production from clean energy will play an increasingly important role.

In addition to the conventional modules, solar roof tiles are also being developed. What other commercial applications do you anticipate?

All buildings must be energy efficient or – even better – become an energy source themselves. For facades, there are now white panels or terracotta-like panels for the roof. Thanks to "transformative" PV devices, in which the solar cells are covered by a coloring film, as is already the case, there are in principle no limits to what can be achieved. There are wonderful new possibilities, even solar cells as a work of art!

Where else can the modules be integrated?

On mobile devices like cars, trucks, drones, planes, watches... there are many more applications to come. ◀

For quite some time now, solar modules have not only been used on roofs, but also to decorate entire facades, as is the case here in Switzerland.

On this terrace, photovoltaics itself becomes a work of art, surrounded by plants and architecture.

Photography: S.Eberhard and L.E Perret-Aebi Compaz, provided with courtesy of CSEM

Solar power is increasingly attractive for consumers

The age of solar energy begins now. After all, it is by far the most cost-effective, environmentally and climate-friendly technology for generating electricity. And it is strategically important to reduce the West's dependence on gas and oil.

B

Beat Unternährer @B_Unternaehrer 01/23/22

I am now (partially) equipped for a power blackout. Solar roof (30,000 kWh; 35 kWp) installed. Top solar location; a few months from planning to implementation; investment costs tax-deductible; massively better return than, for example, the minimum interest from a retirement fund. It's fun.

"At the European level, the EU Commission wants the Green Deal to achieve climate neutrality by 2050 and a Europe-wide decarbonization of the energy sector with a renewable share of 38 to 40 percent by 2030."

Beat Unternährer shares his joy with friends and acquaintances on Twitter: "I'm ready for a power blackout. Solar roof installed. Top location. It's fun." The explosion in energy costs in the recent past is not only affecting the individual electricity consumer, but also the entire energy industry and politics.

The energy transition – away from fossil and towards renewable energy sources – is unavoidable if we are to reduce CO_2 emissions and avert a climate catastrophe. Add to this the realization gained from current political developments that it is imperative for our survival to reduce our dependence on gas and oil. Today, these beliefs are shared by the majority. And yet: Will the turnaround succeed fast enough or is a massive power shortage imminent?

Photovoltaics is increasingly seen as a green solution to the energy problem. After just two decades of development, it is already by far the most cost-effective, environmentally and climate-friendly technology for generating electricity. The age of solar energy begins now.

Solar parks on alpine pastures

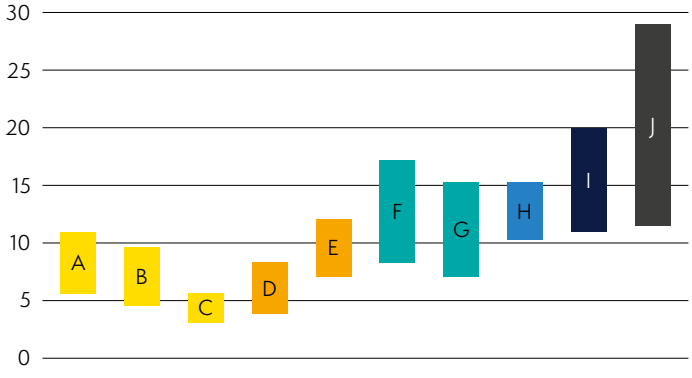
However, in Switzerland, Meyer Burger's country of origin, the share of solar power is only four percent. If the country wants to become climate neutral by 2050, half of the electricity would have to be generated by sunlight. This would require not only the efforts of individuals like Beat Unternährer, every third property owner would also need to install solar modules on their roof. In addition, modules would have to be installed on a third of all infrastructure buildings.

In the national energy debate, an idea by an artist from Valais recently caused a stir. He successfully launched the project to create a solar park with 36,000 panels on an area of ten hectares on an alpine pasture above the treeline, which will supply electricity for 5,200 households. Located between Zermatt (Switzerland) and Domodossola (Italy), the Valais high plateau is sunny all year round and has an optimal slope towards the south. Photovoltaic systems in the Alps have the great advantage that they supply half of the electricity in the winter months, compared to just 25 to 30 percent for PV systems in the lower regions. The Valais native is now rallying scientists and politicians behind him. A former president of the Swiss Social Democrats party with roots in Valais is doing his utmost to promote this future project. He's not the only one who is convinced that alpine PV systems could make an important contribution to closing the electricity gap in Switzerland.

Phasing out nuclear power and coal-fired power is creating huge challenges for Europe's electricity supply. In Germany, coal is still the most important energy source. But the country is planning a CO_2 reduction of 80 to 95 percent by 2050 compared to 1990 levels. >

Solar energy is cheap

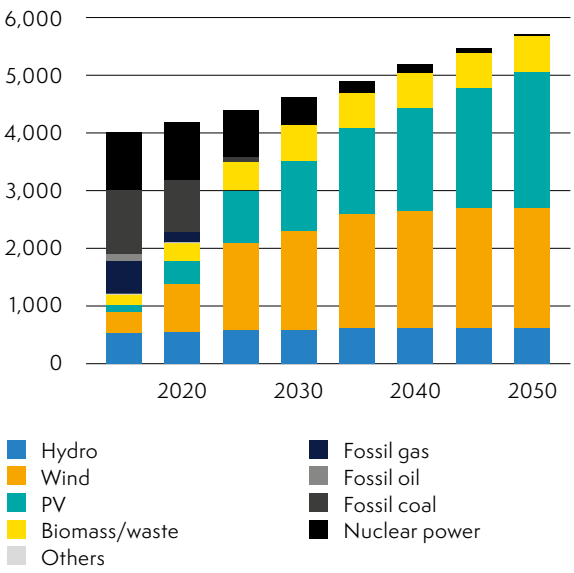
Levelized cost of energy EUR Cent/kWh, 2021



A PV, roof, small
C PV, roof, large
E PV, free
G Wind, onshore
H Wind, offshore
I Bio-gas
J Solid biomass
K Lignite
L Hard coal
N Gas

More sun, more wind

Primary power generation in TWh



At the European level, the EU Commission wants to achieve climate neutrality with the Green Deal by 2050 and Europe-wide decarbonization of the energy sector with a renewable share of 38–40 percent by 2030. If Europe wants to leave the fossil-nuclear energy age behind, photovoltaics must play an important role.

Strengthening innovative PV projects

The global demand for solar energy is immense; today, it only constitutes four percent of the demand. The capacity of the photovoltaic systems is currently around 770 gigawatts (GW) worldwide, and 145 GW have been added last year according to the energy agency.

The target of the new coalition government in Germany for expanding photovoltaics is 200 GW by 2030. According to the coalition agreement, all suitable roof surfaces shall be used for solar energy in the future. This will become mandatory for new commercial buildings and the norm for new residential buildings. The government also wants to radically reduce bureaucratic hurdles. Innovative solar energy such as agricultural and floating PV will also be strengthened.

Asian companies in particular have benefited from the boom so far. But the transition to renewable energy fuels the renaissance of the European solar industry, and Meyer Burger is leading the way here.

The company has developed the next generation of solar technology: heterojunction/SmartWire technology. It can be used to establish permanently competitive production in Germany, Europe and the USA, which has the best prospects of holding its own against Asian competitors in the long term. Due to the expected high demand for solar modules in this country, developing production in European markets is not only a meaningful step, but also a must – particularly since this is both ecologically and socially sustainable thanks to shorter transport routes and fair working conditions.

Solar power is becoming increasingly cheaper

As a result, the state of Saxony-Anhalt and the Federal Republic of Germany secured up to 15 million euros in environmental aid for Meyer Burger to set up production of heterojunction (HJT) solar cells in Thalheim (city of Bitterfeld-Wolfen).

Solar power is also becoming increasingly attractive from a financial perspective. According to a study by the Fraunhofer ISE from 2021, PV systems achieve a levelized cost of energy (LCOE) of between 3.12 and 11.01 cents/kWh (without taking into account value added tax), depending on the system type and solar radiation. This means that PV plants have the lowest average LCOE – not only among renewable energies, but also among all types of power plants – although offshore wind plants are also recording falling LCOE (chart). Fraunhofer assumes a "learning rate" of 15 percent per year for PV systems. Accordingly, in 2040, the levelized cost of energy will be between 3.6 and 6.8 cents/kWh for small PV rooftop systems and between €1.9 and €3.5 cents/kWh for ground-mounted systems. As early as 2024, the levelized cost of energy of all PV systems without battery storage will be under 10 cents/kWh. Although these remain dependent on the purchase price and solar radiation at the respective location, the trend is clear: Solar power is becoming increasingly cheaper. Beat Unternährer will continue to enjoy his solar roof in the future. ◀

"Due to the expected high demand for solar modules in this country, developing production in European markets is not only a meaningful step, but also a must – particularly since this is both ecologically and socially sustainable."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