

Press release

A milestone in the Swiss-Inno HJT Project

Paving the way for the production of high-performance solar cells

Neuchâtel, Switzerland, November 17, 2014 – Doris Leuthard, a member of the Swiss Federal Council, opened a pilot plant for the production of high efficiency heterojunction (HJT) solar cells at Meyer Burger Research AG in Hauterive, Neuchâtel today. The Swiss solar industry supplier Meyer Burger is aiming to further optimize an innovative cell coating process to industrial manufacturing standards with this pilot plant. The plant was developed together with CSEM and with support from the Swiss Federal Office of Energy and the Canton of Neuchâtel. This process will produce even more efficient solar cells in the future.

High efficiency, high yield and low production costs are the advantages with which the process for producing highly efficient solar cells with heterojunction technology (HJT) will have a major impact on the solar market in the future. The pilot plant was inaugurated today at Meyer Burger Research, a subsidiary of the Meyer Burger Group, in the presence of Swiss Federal Council member Doris Leuthard. The ceremony marked a first major milestone. The pilot production is the heart of the wide-ranging *Swiss-Inno HJT* project, which is promoted as part of the pilot, demonstrations and flagship program of the Swiss Federal Office of Energy and the Canton of Neuchâtel. Federal Council member Leuthard praised the project: "The production plant inaugurated today is a successful example of the collaboration between advanced research and market-driven development as well as a flagship project for Switzerland's innovative drive in the growing cleantech sector. Thanks to its industrial and scientific expertise, Switzerland is ideally positioned to establish itself in a challenging international arena."

Jean-Nat Karakash, a Neuchâtel State Council member, also welcomed this highly innovative project: "If you forge collaboration with local industry using cutting-edge technologies from research and development institutes, innovative ideas can be quickly implemented into products. Meyer Burger Research, formerly Roth & Rau Research, made the right decision when they chose this region as the location for their research and development center several years ago."

Vast market potential

The Meyer Burger technology group is a leading global equipment provider in the photovoltaic industry. As part of this project, it is striving to optimize the highly efficient HJT coating technology in terms of performance, process and costs as well as to scale it up for industrial volume production.

With heterojunction technology, the Swiss company holds a trump card in the global market of the solar industry. After all, the technology offers two key advantages: HJT cells deliver higher solar energy yields and the innovative production process enables low cost mass production. Peter Pauli, CEO of the Meyer Burger Group said: "The industrialized manufacturing of high-performance solar cells is at the heart of photovoltaic production. The Swiss-Inno HJT project drives further development of a forward-looking, highly efficient cell technology. Working together with CSEM, we will further optimize the important economic advantages, such as lower production costs and higher energy yields at the same time and thus lower the costs of solar energy in the long term."

Pilot plant for further development

The pilot plant has a production capacity of 600 kilowatts. The manufactured cells are built into modules and tested in both the laboratory and the field. At the same time, new technologies are developed at the plant, which make the solar cells even more efficient and production even more cost-effective. Several partners, including the PV-center of the CSEM, Meyer Burger Technology and both of their subsidiaries Meyer Burger Research and PASAN, are working together to achieve this.

"The Swiss-Inno HJT project is an example of technology transfer to industry," explained Christophe Ballif, VP of the PV-center at the CSEM. "The foundations for the innovative production process were developed at the Institute of Micro Technology at the Swiss Federal Institute of Technology (EPFL) in Neuchâtel, Switzerland. Thanks to the Meyer Burger Group and the support of the CSEM PV-center, we quickly brought the technology to industrial maturity. With the Swiss-Inno HJT project, we are taking a significant step further with the innovation and performance of PV cells."

If the additional optimizations are successful, the project partners expect a module efficiency of 21 percent and production costs below 0.6 CHF/Wp.

HJT technology

Heterojunction silicon technology consists of ultra-thin (several thousandths of a micrometer) layers of amorphous silicon that have been deposited on both sides of a monocrystalline silicon wafer. This creates a heterojunction between the two types of silicon, which lends the technology its name. HJT cells achieve an efficiency of more than 22 percent. What's more, the efficiency losses at high operating temperatures are minimal compared to other cell technologies. This is why HJT modules deliver higher solar energy yields.

The production process developed by Meyer Burger and ETH Lausanne enables cost-effective mass production. The amorphous silicon layer is separated using plasma-enhanced chemical vapor deposition (PECVD) and only requires a few production steps. The process operates at temperatures close to 200°C instead of over 700°C as with conventional processes. This saves a great deal of energy and makes it possible to produce thinner silicon wafers, which in turn lowers material requirements. In addition, considerably less silver is required for the contacts.

After the Swiss-Inno HJT project is completed, the pilot line will serve as a key platform for research and development to further enable a continuous improvement process under industrial production conditions and help bring new innovations to market maturity. These measures aim to ensure the existing competitive advantage over the long term.

Additional information

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Complimentary Information on the project and the Swiss-Inno HJT partners**About Swiss Inno HJT**

The Swiss Federal Office of Energy (SFOE) 'pilot, demonstrations and flagship programme' promotes the development of energy technologies in the efficiency and renewable energy sector. By supplementing projects initiated by the private economy and public-sector research institutions, it promotes the development of efficient and sustainable technologies to establish them on the market and to contribute to the objectives of the Energy strategy 2050.

The Swiss Inno HJT project involves Meyer Burger Technology Ltd and its subsidiaries PASAN SA and Roth & Rau Research SA as well as the PV-center of CSEM SA. The project started October 1st 2013 and will run over a period of 3 years. The SFOE grant, complemented by partner investments and by a financial support of the Neuchâtel regional government will permit to support the set-up two demonstration lines: the pilot line in the new infrastructures of Meyer Burger Research AG in Hauterive, Switzerland and the metallization line at the PV-center of CSEM in Neuchâtel, Switzerland. The goal of this project is to develop advanced silicon hetero junction solar cell and module interconnections in order to achieve very high power output and performance ratio. Such modules will be produced in a demonstration line and monitored in outdoor test PV systems to show the benefit of the developed technology over state-of-the-art commercial PV products. <http://www.swissinno-hjt.ch>

CSEM – an innovation center and a photovoltaic expertise

CSEM SA, founded in 1984, is a private research and development center specializing in microtechnology, nanotechnology, microelectronics, system engineering, photovoltaics and communications technologies. Approximately 400 highly qualified and specialized employees from various scientific and technical disciplines work for CSEM in Neuchâtel, Zurich, Muttenz, Alpnach and Landquart.

Established in 2013, CSEM PV-center has been created to accelerate the pace of technology transfer in photovoltaic, to bring to maturity new high-tech solutions for components and systems, and to serve the Swiss and global renewable energy industry. *Swiss Inno HJT* is a perfect illustration of CSEM's central role in supporting Swiss industrialization efforts by providing a full range of services to its partners, spanning from technology development to product prototyping, including the realization of full size demonstration systems. CSEM PV-center work closely with the EPFL PV-lab installed in Neuchâtel and with other Swiss research institutes

Further information is available at www.csem.ch

Meyer Burger - a leading global technology Group

Meyer Burger is a leading global technology Group specialising on innovative systems and processes based on semiconductor technologies. The Group's focus is on photovoltaics (solar industry) while its competencies and technologies also cover important areas of the semiconductor and the optoelectronic industries as well as other selected high-end markets based on semiconductor materials. The Group currently employs more than 1,800 people across three continents. Over the past ten years, Meyer Burger has risen to the forefront of the photovoltaic market and established itself as an international premium brand by offering superior precision products and innovative technologies.

The Group's offering in systems, production equipment and services along the photovoltaic value chain includes the manufacturing processes for wafers, solar cells, solar modules and solar systems. Meyer Burger provides substantial added value to its customers and clearly differentiates itself from its competitors by focusing on the entire value chain.

The Group's comprehensive product portfolio is complemented by a worldwide service network with spare parts, consumables, process know-how, customer support, after-sales services, training and other services. Meyer Burger Group is represented in Europe, Asia and North America in the respective key markets and has subsidiaries and own service centres in China, Germany, India, Japan, Korea, the Netherlands, Switzerland, Singapore, Taiwan and the USA. The Group is also working intensively to develop new markets such as South America, Africa and the Arab region. The registered shares of Meyer Burger Technology Ltd are listed on the SIX Swiss Exchange (Ticker: MBTN).

Further information is available at <http://www.meyerburger.com/en/>