PRESS RELEASE

Research collaboration initiated between the Solar Energy Research Institute of Singapore (SERIS) and FHR Anlagenbau GmbH in the field of new Transparent Conductive Oxide (TCO) coatings

Ottendorf-Okrilla, 05 November 2013 – Today, the Solar Energy Research Institute of Singapore (SERIS) and FHR Anlagenbau GmbH, Germany jointly announced the start of a close collaboration on the development of new Transparent Conductive Oxide (TCO) coatings that have broad applications in the manufacture of solar photovoltaic modules and flat panel displays. To meet industrial requirements, TCOs need to be both optically highly transparent and electrically highly conducting. At SERIS, several years of experience have been built up in thin-film technologies, and a group of researchers is working on the development of next-generation high-performance TCOs. In TCO development the use of toxic, scarce and expensive materials needs to be reduced or completely eliminated, without compromising the functional properties. TCOs are widely used in thin-film solar cell technologies such as CdTe, CIGS and amorphous silicon, they are also used in advanced high-performance silicon wafer solar cell technologies such as heterojunction solar cells as well as used for touch panel and display applications which represent the

Professor Armin ABERLE (left), CEO of the Solar Energy Research Institute of Singapore (SERIS) at the National University of Singapore, and Dr Reinhard FENDLER, CEO of FHR Anlagenbau GmbH. © FHR/SERIS 2013

cutting-edge requirements of TCO layers. Both SERIS and FHR have agreed to share their experience and expertise, and to join hands in a collaborative project aiming at lowering the cost of solar energy and improving the performance of flat panel displays.

"At SERIS we are in a race, together with the PV industry, to drive down the cost of solar energy" said Professor Armin ABERLE, CEO of the Solar Energy Research Institute of Singapore. "We explore advanced solar cell concepts, and strive to implement them in a high-volume low-cost process. Together with FHR we hope to develop advanced transparent conductive oxide layers that will allow extracting more energy out of a solar cell. This is one of the many industry-relevant research projects going on at SERIS and it will contribute to making solar energy the dominant energy source of the 21st century."

Dr Reinhard FENDLER, CEO of FHR Anlagenbau GmbH, added that "Nowadays, the vacuum deposition of TCOs plays a key role in the fields of flat panel displays, touch screens, flexible electronics, and renewable energy. But the full potential of these highly-functional TCO films with their unique features of optical properties and wide controllable electrical conductivity is still a matter to be optimized. On the path to an even higher quality of TCO layers, further improvements can be achieved by well-engineered vacuum process environments and process controls. By cooperating with SERIS we enter into a strategic partnership with the aim of enhancing our leading know-how in vacuum process technologies on a high level and to offer state-of-the-art vacuum coating solutions to our customers."

SERIS has acquired a state-of-the-art and highly versatile in-line magnetron sputtering platform from FHR, which provides excellent process control and which is capable of depositing a variety of advanced TCO materials onto substrates with a size of up to 300 mm × 400 mm. This platform will allow SERIS to become a leading R&D centre in thin-film and heterojunction solar cell research, pushing these technologies to a competitive position in the renewable energy landscape.

About SERIS

The Solar Energy Research Institute of Singapore (SERIS) is Singapore's national institute for applied solar energy research. It commenced operations in April 2008. SERIS is sponsored by Singapore's National Research Foundation (NRF) via the Economic Development Board (EDB), as well as the National University of Singapore (NUS). It has the stature of an NUS University-level Research Institute and is endowed with considerable autonomy and flexibility, including an industry friendly intellectual property policy. SERIS is globally active but focuses on technologies and services for tropical regions, in particular for Singapore and South-East Asia, and reaches out to India and China.

About FHR

FHR Anlagenbau GmbH is specialised in the development of innovative thin-film coating technologies and vacuum coating equipment and renders various services in the field of thin-film technology. The major field of business is the construction of coating plants which feature a range of vapour deposition, magnetron sputtering, CVD and ALD technologies for industrial production and research applications. These systems are used in many branches of industry, including photovoltaics, in particular for CIGS solar cells and organic PV cells, solar thermal plants, optics, electronics, sensor technology, and in the automotive sector. The product portfolio includes modular cluster systems for stationary coating of substrates, inline systems with vertical or horizontal substrate transport for coating glass plates or tube surfaces, as well as roll-to-roll plants for coating flexible substrates such as metal strips or polymer films. FHR closely collaborates with renowned research institutions and industry partners world-wide. The company takes a leading market position, in particular in the field of roll-to-roll vacuum coating equipment. In addition to plant engineering, FHR manufactures planar and tubular sputtering targets and has a powerful service department.

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