

## Press Release

### Manufacturing of individual OLED and organic solar cells with cloud-concept

*Whitin the EU-funded project ManuCloud consortium developed a façade module including OLED and organic photovoltaic.*

**Dresden, August 20<sup>th</sup>, 2013:** The manufacturing of individually designed organic light-emitting diodes and solar cells and their combination can be realized in the near future. After three years the project ManuCloud (distributed Cloud product specification and supply chain manufacturing execution infrastructure), which was funded by the European Union, now successfully completed its work. As result the project partners Heliatek, Fraunhofer COMEDD, Tridonic Dresden and GSS Gebäude-Solarsysteme GmbH presented a demonstrator of a façade module, which combines the OLED- and OPV-technology. The objective of the ManuCloud project was the development of a service-oriented IT environment as basis for the next level of manufacturing networks by enabling production-related inter-enterprise integration down to shop floor level. Industrial relevance was guaranteed by involving industrial partners from the organic photovoltaic, organic lighting and automotive supply industries.

The transition from mass production to personalized, customer-oriented and eco-efficient manufacturing is considered to be a promising approach to improve and secure the competitiveness of the European manufacturing industries in the future, which constitute an important pillar of the European prosperity. One precondition for this transition is the availability of agile IT systems supporting this level of flexibility on the production network layer on the one hand and on the factory and process levels on the other hand.

The European Union's Seventh Framework Programme funded project ManuCloud was setup in 2010 with the mission to investigate the production IT-related aspects for this transition and to develop and evaluate a suitable IT infrastructure to provide better support for on-demand manufacturing scenarios, taking multiple tiers of the value chain into account. On this path, the ManuCloud members implemented the vision of a cloud-like architecture concept, providing users with the ability to utilize the manufacturing capabilities of configurable, virtualized production networks, based on cloud-enabled, federated factories, supported by a set of software-as-a-service applications.

Two seminal technologies have been selected to demonstrate the application context for the ManuCloud concept: The organic photovoltaic (OPV) and the organic LED (OLED) technology. Each of them is driven by specific market needs. Both markets are currently in an early stage. However, market research predicts a multibillion dollar market for these products already in a few years. Due to the unique properties of large-area light generation and energy harvesting, coming with special features like adjustable colors, transparency and a thin and lightweight structure, OLAE (organic and large area electronic) technologies are expected to generate numerous new applications with a substantial share being customized solutions. The project has setup and evaluated a manufacturing cloud infrastructure for customized organic lighting and solar cell solutions.

Tridonic Dresden defined application scenarios together with the partners based on discussions with potential customers of the manufacturing environment. The demonstrated façade element was identified as one interesting scenario. The definition of the façade element and the setup of the lamination process including setup and test runs were driven by Tridonic Dresden together with Fraunhofer COMEDD, Heliatek and GSS Gebäude-Solarsysteme. The partners developed a process to integrate temperature and pressure sensitive OLED and OPV devices into glass to create an integrated active glass laminate.

**The ManuCloud consortium:** The ManuCloud consortium was composed of eight partners from four different EU member states (Austria, Germany, Hungary, United Kingdom). The partners were the following: advanced clean production Information Technology GmbH (acp-IT), Robert Bosch GmbH, Fraunhofer Institute for Manufacturing Engineering and Automation (IPA, consortium leader), Fraunhofer Research Institution for Organics, Materials and Electronic Devices COMEDD, HELIATEK GmbH, Tridonic Dresden (formerly LEDON OLED Lighting GmbH & Co. KG), nxtControl GmbH, Computer and Automation Research Institute of the Hungarian Academy of Sciences, and the University of Strathclyde.

Thanks to all partners:



The research leading to this results has received funding from the European Union's Seventh Framework Programme under grand agreement number 260142.



Please find more information about the project: <http://www.manucloud-project.eu/>

## About Heliatek:

Heliatek, the solar film manufacturer, currently holds the world record for organic photovoltaic cells with a cell efficiency of 12%. The company has recently opened the first factory of its kind in the world for the production of organic photovoltaic cells in a continuous roll-to-roll process under vacuum conditions and is working with prominent partners in the industry towards the market launch of flexible organic solar films.

The key to Heliatek's success is the family of small organic molecules – oligomers – developed and synthesized at its own lab in Ulm, Germany.

Heliatek is the only solar company in the world that uses the deposition of small organic molecules in a low temperature, roll-to-roll vacuum process. Its solar tandem cells are made of nanometers-thin layers of high purity and uniformity. This enables the company to literally engineer the cell architecture to systematically improve efficiency and lifespan. This technology is very similar to the well-established OLED technology (organic LEDs) except that it operates in reverse, taking in light to create electricity. This gives Heliatek access to readily available manufacturing machines, giving it a fast track to reliable, volume production.

Heliatek was spun-off in 2006 from the Technical University of Dresden (IAPP) and the University of Ulm. The company is the global leader in the development of organic photovoltaics (OPV) based on small molecules and the manufacture of organic solar films.

Heliatek manufactures and delivers customized solar foils as an energy component to the material manufacturers industry for applications in the building and construction, light structures, automotive and electronic markets.

Heliatek maintains a total staff of 70 specialists at its facilities in Dresden and Ulm, Germany. Investors in Heliatek include leading industrial and financial companies such as BASF, Bosch, RWE, and Wellington Partners.

Research and development work, as well as the installation of production technology, has been funded by the Free State of Saxony, the BMBF (Federal Ministry for Education & Research), the BMWi (Federal Ministry of Economics and Technology) and the European Union.

## For more information please contact:

Anja Reich	T (+49-351) 213-03430
Business Development & Marketing Coordinator	F (+49-351) 213-03440
Treidlerstraße 3	<a href="mailto:Anja.Reich@heliatek.com">Anja.Reich@heliatek.com</a>
01139 Dresden, Germany	<a href="http://www.heliatek.com">www.heliatek.com</a>

## About Tridonic Dresden:

Since July 2013 Tridonic Dresden GmbH & Co. KG is a 100% subsidiary of the Zumtobel Group. Originally Tridonic Dresden was founded as a joint-venture company under the leading of LEDON OLED Lighting GmbH & Co. KG by the Zumtobel Group together with the Fraunhofer Gesellschaft and some employees of the Fraunhofer Institute for Photonic Microsystems (IPMS) in autumn 2009. The head office is in Dresden – one of the most important centers for OLED technology in Europe.

Main aim of Tridonic Dresden is the further processing and finishing of OLED lighting elements to applicable OLED modules. Some of the core competencies are the electrical integration and electronically control and driving of OLED lighting modules as well as the improvement of the quality of light.

## For more information please contact:

Tridonic Dresden GmbH & Co. KG  
Corinna Löffler  
Marketing/ PR Manager  
Tel.: +49 351 795 975 – 19  
[corinna.loeffler@tridonic.com](mailto:corinna.loeffler@tridonic.com)  
[www.tridonic.com/oled](http://www.tridonic.com/oled)

## About GSS Gebäude-Solarsysteme GmbH:

GSS GmbH, which was founded in 1992, exactly 21 years ago, focuses on manufacturing, i.e. actual production of photovoltaic modules in the first place. It also handles related trading operations for distribution within Germany and Europe - for special-purpose modules on a global scale.

Customers may choose from a great variety of design & performance criteria:

- different PV module types (glass-foil module, foil-foil module, glass-glass module, PV-insulation-glass module),
- different geometrical shapes (rectangle, square, triangle, trapeze, etc.),
- different color of glass-foil laminates on back walls (white, anthracite, blue, translucent, transparent white, etc.),
- different types of solar cells (monocrystalline, polycrystalline and amorphous solar cells),
- different custom- or project-adapted applications (facade, roof, overhead area),
- photovoltaic modules in laminate design style or with framing around (included colored frame on special request), as "Original Equipment Manufacturer" (OEM) module.

With the flexibility, skills and high level of general knowledge of all staff members, we managed to design our own special appliances, tools and fixtures – a vital prerequisite for the production of specific PV modules. Their hardworking labor and relentless commitment made it possible to design innovative products and develop these to the point of release into commercial production by cooperation with other companies operating in Thuringia.

In international business, solar cells (polycrystalline, monocrystalline and flexible solar cells, as well as OLED) are being purchased and reprocessed into modules. Based on currently available technological equipment and resources, we are in a position to manufacture PV modules of a size from 150 mm x 150 mm to 3200mm x 2100mm (overall dimensions).

### For more information please contact:

GSS GmbH	Tel.: +49(0) 36602 / 9049 0
Franziska Ettrich	Fax: +49(0) 36602 / 9049 49
Wiesenring 2	<a href="mailto:f.ettich@zre-ot.de">f.ettich@zre-ot.de</a>
07554 Korbußen/Germany	<a href="http://www.gss-solarsysteme.de">www.gss-solarsysteme.de</a>

## About Fraunhofer COMEDD:

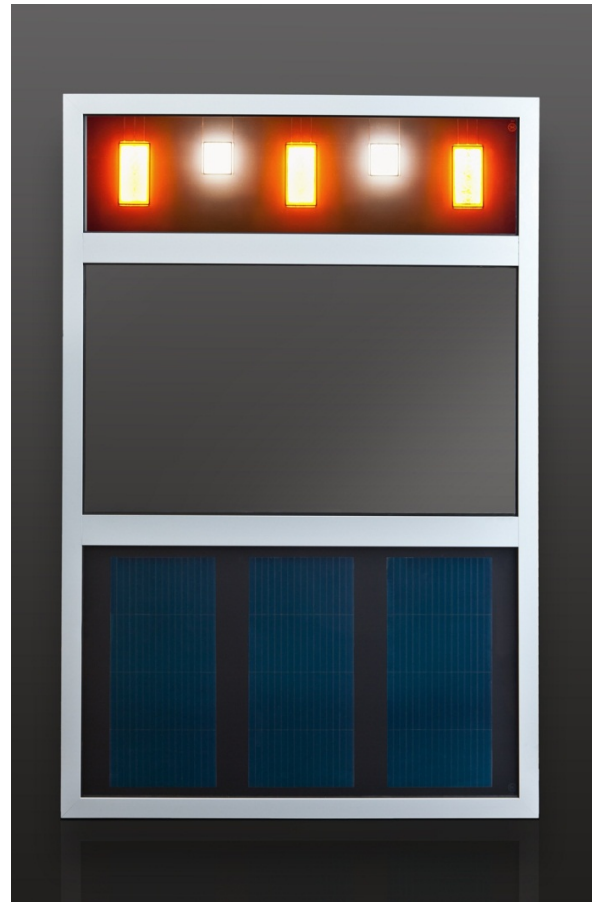
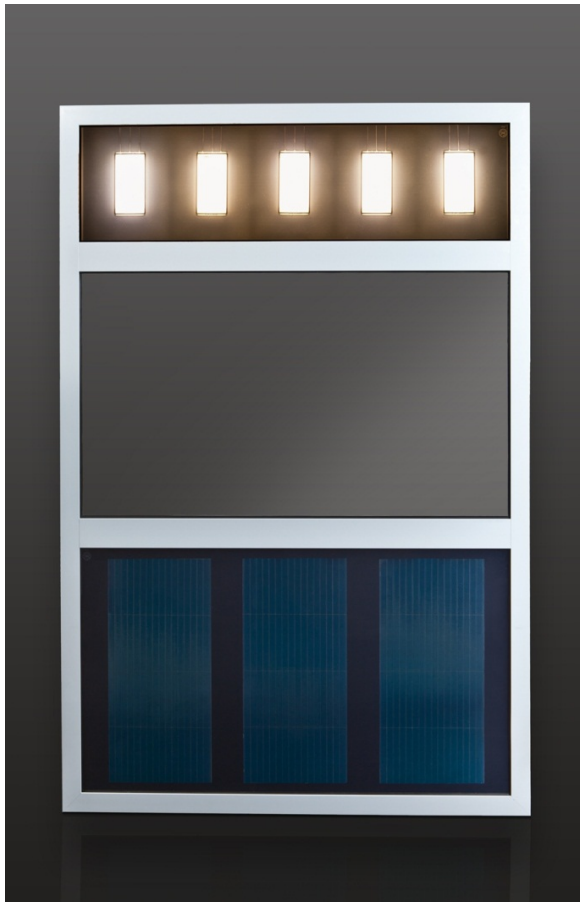
Fraunhofer COMEDD was founded as an independent research institution of the Fraunhofer-Gesellschaft in order to transfer the results of research and development in the field of organic materials and systems to production. The institution combines research and development works for the production, integration and technology of organic electronic devices. The focus of Fraunhofer COMEDD lies in customer- and application orientated research, development and pilot fabrication of novel module concepts and fabrication methods for these organic electronic devices. Fraunhofer COMEDD is an European-wide leading production-related research and development center for organic semiconductors focusing on organic light-emitting diodes and vacuum technology. The Fraunhofer COMEDD clean room consists of the following equipment:

- a pilot line for the fabrication of OLEDs on 370 x 470 mm<sup>2</sup> substrates,
- two pilot lines for 200 mm wafer for the OLED integration on silicon substrates as well as
- a research line for the roll-to-roll fabrication on flexible substrates.

Fraunhofer COMEDD offers a wide range of research, development and pilot production possibilities, especially for OLED lighting, organic solar cells and OLED microdisplays.

### For more information please contact:

Fraunhofer COMEDD	Tel.: +49 (0) 351/8823-238
Ines Schedwill	Fax: +49 (0) 351/8823-394
Head of Marketing	e-mail: <a href="mailto:Ines.Schedwill@comedd.fraunhofer.de">Ines.Schedwill@comedd.fraunhofer.de</a>
Maria-Reiche-Str. 2	Internet: <a href="http://www.comedd.fraunhofer.de">www.comedd.fraunhofer.de</a>
01109 Dresden/Germany	



Demonstrators of the façade module with TABOLA® OLED modules of Fraunhofer COMEDD at the top part of the demonstrator (white on the left, white and orange on the right) and OPV-modules at the lower area.