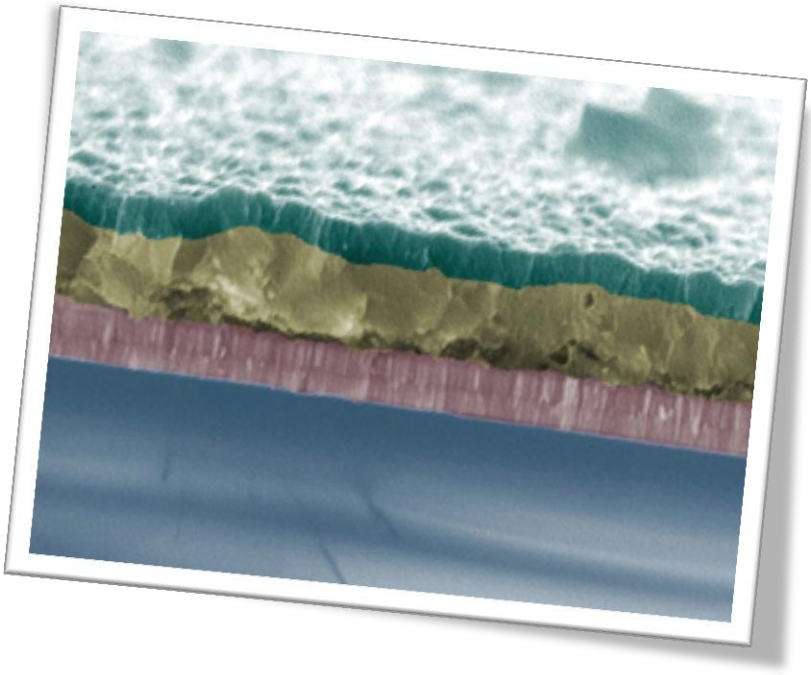
PHOTOVOLTAIC MATERIALS - NEXT GENERATION TECHNOLOGIES



The solar power industry continues to expand worldwide with new markets opening up in high sun exposure locations such as the MENA region. There has been global upheaval in the solar power manufacturing market since the 2008 economic crash when many renewable energy subsidies were cut, there was less funding for large projects and the module industry was in oversupply. This led to heavy pressure on manufacturers to make production lines more efficient and cost-effective and many companies moved manufacturing to Asia and reviewed their production equipment or moved out of the market altogether.

At the same time as experiencing cost pressures, insurers of photovoltaic systems are demanding a lifetime guarantee of 25 years or more, so quality and reliability are critical throughout the supply chain. Polymer materials are used in key components in photovoltaics with the largest volumes in encapsulant and backsheets, and they are also found in adhesives, seals and electrical parts. Applied Market Information analyst Cristina de Santos is studying the markets and will give an overview of her work at the seventh annual AMI international conference on Polymers in Photovoltaics 2016, which takes place 2-3 February 2016 at the Hotel Nikko in Duesseldorf, Germany. This annual event examines the latest developments in materials and production technology for photovoltaic rigid and flexible systems. There will also be a paper from SolarPower Europe on the global energy generation outlook.

In 2015 organic photovoltaics (OPV) are starting to become more commercial. In these systems the traditional silicon is replaced by complex polymers, which react to light and generate electrons. They can be printed onto flexible substrates and were on show at EXPO 2015 in Milan in leaf and other decorative forms. There is great potential for integration into other structures from architecture

Encapsulants are vital to protect the silicon in conventional modules, but there are always questions about the performance of these sheets. The Fraunhofer Center for Silicon Photovoltaics CSP has tested polymer blends for this application, Specialized Technology Resources (STR) has developed new polyolefin encapsulants and Vladislav Poulek has worked with silicone materials. In Italy Coveme SpA has found a solution for dielectric encapsulant for back contact backsheet. It is also possible to improve quality control with conventional EVA: the Carinthian Tech Research laboratory has developed advanced in-line monitoring systems.

System reliability is essential for energy security. Hanwha Q Cells has examined the phenomenon of potential induced degradation and recovery in the field. Selection of backsheets is also important and the Polymer Competence Centre in Leoben has been examining the comparative data on different materials. Weathering testing is a key performance criterion for outdoor applications and Renolit has been performing accelerated tests on module coupons.

Photovoltaics can be made in flexible forms and integrated into waterproof membranes: a test project has been conducted by Derbigum in Belgium. Meanwhile at the CSEM in Switzerland they have been developing white solar modules to create real building elements for building integrated PV (BIPV) and at the ECN in the Netherlands researchers are looking at the design and materials aspects of architectural PV integration.

The economics of production equipment and technology are vital to