Session	Advanced Coating Technologies (II)
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Chair	Hasan İsmail

Building Integrated Photovoltaic (BIPV)

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Biography[2]

2013-2016	PhD Technical Chemistry, Heterogeneous Catalysis/Electrocatalysis (University of Leipzig)
2016-2019	Scientist CdTe thin film PV (Calyxo GmbH)
2019-2020	Group Leader Research and Development (Cayxo GmbH)
2020-2024	Scientist CdTe thin film PV (CTF-Solar GmbH)
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Abstract

In the effort to reverse climate change and phase out the consumption of fossil fuels, solar energy is indispensable. While representing far less installed capacity than utility-scale systems, building-integrated photovoltaics (BIPV) is nevertheless an important and significant component of the increased adoption of photovoltaics necessary for the transition to a sustainable energy supply, and the segment has been rapidly growing along with the solar energy market as a whole. BIPV can be divided into three main categories: rooftop, facade, and windows (semi-transparent). Rooftop accounts for a little more than half of the total share, and based on previous trends, the relative ratios of these three categories is fairly constant over time. Trends in market growth indicate that by 2029, European demand for solar windows will exceed 1 gigawatt.

In terms of price and performance, crystalline silicon historically and presently is the dominant PV technology with 95% market share overall, particularly in utility and residential applications. However, for building facade and especially for semi-transparent applications, thin-film technologies are strongly favoured.

CdTe is the most well-established thin-film technology worldwide with almost exclusive thin-film market share, currently delivering module conversion efficiencies in the range of 18-20%. As a polycrystalline thin-film technology, CdTe offers a significant degree of configuration flexibility which is particularly relevant for BIPV. Semi-transparency of nearly any degree is achievable by multiple methods. Module fabrication is largely unconstrained by module size and aspect ratio – modules can be easily designed to accommodate any size and rectangular shape with minimal loss in performance. A number of CdTe BIPV products will be shown in the presentation to demonstrate the potential range of applications, from transparent windows and fences to colorful exterior components.