NEXT-FOIL
Next generation conductive solar foil for flexible photovoltaics

Project duration: from 03.2018 to 02.2020
Report submitted: 02.2019

Publishable Summary

Next generation photovoltaics (PV), based on organic, inorganic or hybrid perovskite absorbers, can be fabricated as thin, lightweight and flexible modules. This makes them attractive for integration in building façades and consumer products. These PV technologies rely on substrates coated with a transparent electrode, which is required to have high transparency (>85%) combined with low sheet resistance (<20 Ω/sq). ITO (indium-tin-oxide) is by far the most commonly used transparent electrode, despite its high cost, as well as its poor mechanical stability and low figure-of-merit when applied on flexible substrates like PET.

NEXT-FOIL develops an alternative to ITO-coated PET, based on dielectric/metal/dielectric (DMD) multilayers, sputtered at deposition rates compatible to high-throughput, industrial production. As dielectrics, single and mixed oxides will be used with different electronic properties to fit the energetics of different solar cell architectures. Combined with Cu and Ag metals, optimal performance/cost ratio will be obtained. DMDs deliver: (i) lower cost than ITO, (ii) sheet resistance lower than 10 Ω/sq, without the need of substrate heating during deposition or post-processing, (iii) stability of the resistance against bending and (iv) adaptability for use as cathode or anode in devices. The competitive edge of the DMD-based foils will be demonstrated with the fabrication of efficient hybrid perovskite modules.

A complementary consortium has been formed to realize the project. AIT will tackle design, simulation and experimental realization of the DMDs, PLANSEE will develop the sputter targets of the new dielectric compounds and SOLARONIX will implement the developed electrodes in efficient perovskite cells and modules. Selected electrodes will be deposited in a roll-to-roll process and further processed into perovskite cells.

Project consortium

Coordinator and all contact details:

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Participating countries and financing:

Country	**Number of organisations involved**	**Project costs in EUR**	**Public funding in EUR**
Austria	2	619'949	442'408
Switzerland	1	265'520	106'206
Total	*3*	*885'469*	*548'614*

Funding agencies involved and contracts

Funding Agency	**Contract N° and Title**
FFG	863517
BFE	SI/501684-01 ‘Contrat de subvention'