KESTCELLS: A new generation of researchers to develop improved solar cells.

In 2012 the European Commission identified a significant lack of academic institutions in Europe able to train new researchers in the field of thin film photovoltaic (PV) technologies based on earth abundant materials. Being aware of this, the Research Executive Agency (REA) funded KESTCELLS to develop an ambitious program for training 14 researchers in 11 different institutions including Research Centers, Universities and Industries all around Europe.

For four years the partners of this ITN-network have worked with a double objective: in first place making a significant advancement in the development of kesterite thin-film solar cells. This technology offers a set of advantages such as a low consumption of raw materials, highly automated and efficient manufacturing processes, low carbon footprint and better performances at elevated temperatures than the standard counterparts. Actually, this field also offers numerous opportunities for multi-disciplinary research in the quest to develop the next generation of low cost thin film PV devices meeting the large PV demand in future.

Secondly, the project has trained 12 PhD students and 2 experienced researchers recruited among more than three hundred candidates all around the world.

Besides, KESTCELLS has focused on three pillars: (i) active exchange of researchers between the partners including industrial exposition in end users premises to the developed technologies; (ii) interdisciplinary training including seminars, thematic workshops, and two business-case modules organized by the prestigious business school ESADE, and finally (iii) organization of bi-annual project meetings in which the fellows went through a close follow-up of their activity and received constructive inputs from senior researchers.

All in all, the project has trained fourteen first class professionals able to advance the PV research, has resulted in more than 50 papers in peer reviewed journals, and supported 6 Theses. From a scientific point of view, it has made a significant contribution to the characterization of fundamental properties of kesterites and understanding their main challenges, thereby suggesting possible strategies for improvements in solar cell efficiency. In fact, a conversion efficiency of 11.8% has been achieved through material engineering and device design, thus surpassing the 10% goal fixed as one of the project objectives. The project has contributed towards the competitiveness of the European PV Industry, helping to increase the production of energy through renewable sources according to the 20/20/20 target established by the European Commission and the SET-Plan.

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