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Development of a strategic Solar Energy Technology Training (SETechTra) module for STEM Undergraduates

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Abstract

As the skills gap between available and in-demand skills in the solar energy technology sector (SETS) continues to expand owing to rapid growth of the sector, the need for Higher Education Institutions (HEIs) to design and run critical Solar Energy Technology Training **(**SETechTra) modules have become urgent and imperative. Informed by findings from review of 100^{+} relevant literatures, analysis of interviews and observations, this paper implements targeted science education concept, complemented with knowledge obtained from 40^{+} schools/colleges outreaches to embed SETS in-demand skills in HEI curriculum. Concept and gained knowledge implementation are demonstrated in the developed undergraduate 30-credits SETechTra module which is designed for science, technology, engineering, and mathematics (STEM) students. The module contents - comprise learning and teaching activities focused on embedding the identified academic, industrial, and entrepreneurial in-demand skills - are drawn with respect to key education theory and practice in Higher Education learning. Module contents are enhanced with essential industry-prevalent software. Module has a total of 300 hours of learning, delivered in 82 hours contact-sessions, and 218 hours of guided independent learning. It is predicted that adoption of the SETechTra module by HEIs across Europe will fast-track the production of more industry specialist-skilled-graduates who possess the SETS in-demand skills. Upon completion of the module, STEM-

graduates are expected to enhance their employment prospects while boosting their entrepreneurial potential within the sector. These projected outcomes will contract the widening skills-gap whilst fast-tracking the delivery of the UN Sustainable Developmen t Goal 7 (SDG-7) by 2030 and Net-Zero by 2050.

Keywords: Higher Education Institutions, Science, Technology, Engineering, and Mathematics (STEM), Solar energy skills-gap, Solar energy technology sector (SETS), Targeted science education