

Solar Energy Technology Training (SETechTra) Module for STEM Undergraduates

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SETechTra project Newsletter#1 - January 2022



SETechTra Project Aims and Objectives

Project Aim

To develop a module for STEM Undergraduates that will support the production of more industry ready graduates for employment in the EU Solar Energy and renewable energy sector, which will in turn positively impact the actualisation of NetZero targets

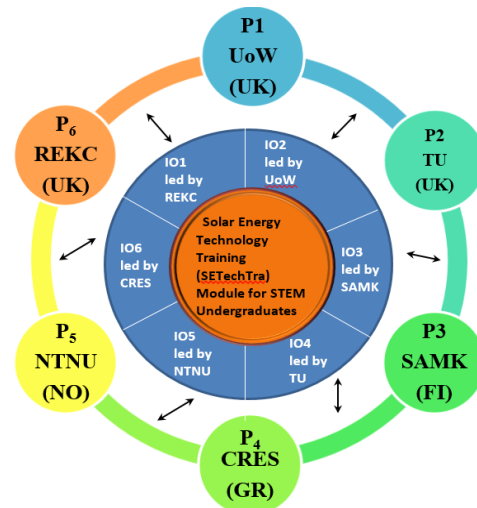
Project Objectives

1. Increases STEM UGs awareness on the trends and developments in the SE sector and the specialist skills essential for securing employment in the SE Sector.
2. Deliver a working curriculum for teaching the SE module to STEM UGs in the Higher Education Institution (HEI) partners, facilitating student and staff mobility and peer learning.
3. Tackle skills gaps and mismatches in the SE sector leading to STEM UGs acquiring specialist SE entrepreneurship/ life-long-skills for employability and career progression.
4. Support actualisation of EU climate change goals in the long run.

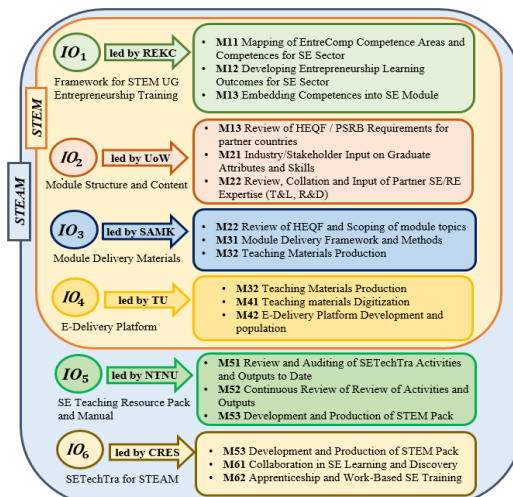


SAMK Solar PV System & Technology Training (<https://www.youtube.com/watch?v=kQT52mxew1k>)

SETechTra project at a glance



Project Methodology Map



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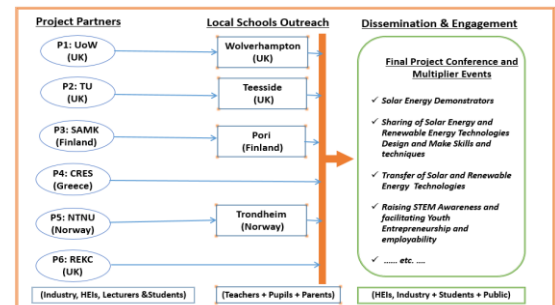
Project Partners

- P₁** UoW: University of Wolverhampton, United Kingdom
- P₂** TU: Teesside University, United Kingdom
- P₃** SAMK: Satakunta University of Applied Science, Finland
- P₄** CRES: Center for Renewable Energy Sources and Saving, Greece
- P₅** NTNU: Norwegian University of Science and Technology, Norway
- P₆** REKC: Research and Knowledge Consultancy, United Kingdom

Project Intellectual Outputs

- IO₁** Framework for STEM UG Entrepreneurship Training
- IO₂** Module Structure and Content
- IO₃** Module Delivery Materials
- IO₄** e-Delivery Platform
- IO₅** SE Resource Pack
- IO₆** SETechTra for STEAM

SETechTra Local Schools STEM Outreach Plan (Dissemination, Engagement and Impact)



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SETechTra Project Advisory Steering Board (ASB)

ASB Members

Gabriel Ozique, UK: Chair.

Dr Kostas Karytsas, Greece: Head of the Division of Renewable Energy Sources at CRES with over 20 years experience in solar and geothermal energy.

Ms. Marika Seppälä, Finland: Dean of the Faculty of Technology at SAMK. Prior to becoming Dean, Marika was the Lead for the Energy and Environment Team. With quality, safety and process management background, she also brings to the ASB her industrial experience, having worked 9 years for Nokia mobile phones.

Dr Andriy Verlan, Norway: Associate Professor, Manufacturing and Civil Engineering Department at NTNU where he has been lecturing in renewable and sustainable energy including Mathematical Modelling in Energy since 2012. He is also a Professor at the National Technical University in the Ukraine.

Mr Charmant Ossian, UK: CEO at REKC Ltd with background in oil and gas industry, but has shifted to renewable energies. He is leading the work on embedding the EU entrepreneurship framework into the developed module and has an MBA.

Dr Perk Lin Chong, UK: Senior Lecturer, Mechanical Engineering department at Teesside University. With background in finite element analysis he has strong expertise in the area of reliability of photovoltaic panels.

The Project Advisory Steering Board gathered virtually on 7th June 2021 for an introductory meeting to discuss expectations and how the ASB could support a successful delivery of the SETechTra Project's objectives. Some project partners also joined the meeting to support the project and answer questions from ASB members.



Q1: Tell us a little about yourself and your links with the SETechTra project.

Thanks for the interview. I am a Chartered Engineer and a Fellow of the Institute of Engineering and Technology. I have worked in various roles in the Technology, Transport and Infrastructure industries (mainly for Multinational organisations), for over 35 years.

In addition to my roles in the industries, I was Visiting Fellow at the University of Greenwich until 2012. Since 2012 I have been Visiting Research Fellow at the University of Wolverhampton. As part of these roles, I have been a member of the Industrial Liaison Advisory Boards for the Faculty of Science and Technology, and an Advisory Board member for various projects being implemented by the University, including the SETechTra project.

Interview with Gabriel Ozique, Chair of the Advisory Steering Board

Q4: Final thoughts.

The World Economic Forum stated that Solar Energy has become the most important source of Energy Generation for Electricity production. The SETechTra project is unique in the collaboration of 6 organisations across Europe – 4 Universities and 2 Industry partners. This should ensure comprehensive work packages for the benefits of Undergraduate students in Europe.

Q2: What are your thoughts about the SETechTra project and its contribution to the Net Zero agenda?

Climate change and transition to NetZero has become imperative for Government and industries globally. Governments have set targets and industries are responding to meet the targets. The challenges for industries are the acute shortages of skills in Sustainability Industries.

The implementation of the SETechTra project is timely and is geared to try to bridge the gap.

Solar energy is a critical area of energy production and SETechTra Project focuses on training the STEM Undergraduates.

Q3: What are essential skills for securing graduate employment in the solar energy sectors?

The Solar energy sector requires a range of skills to be successful. These range from technical, entrepreneurship, communications, project management, and an enquiring mind right through to ingenuity. This includes: R&D, Mathematical and Scientific, design simulations, manufacture of Solar materials, construction & operations of solar plants, maintenance, etc.



What have we achieved so far?

The SETechTra project consortium worked together with input from the ASB, Alumni, students and other stakeholders to :

- Create a mapping of the EU Entrepreneurship Competence Framework and competences of the Solar Energy/Renewable Energy (SE/RE) sector, which was used to develop the entrepreneurship learning outcomes for the SE sector
- Develop a flexible, innovative module structure and contents that can be easily adapted by each HEI partner for specific sector applications, including the energy production and services industry, whilst facilitating the entry of graduate students into the energy job market. The module has four major areas corresponding to 12 weeks of teaching/learning: (a) introduction to renewable energy and solar energy systems, (b) design of solar energy systems, (c) application examples, and (d) entrepreneurial skills Training.
- Create and pilot first-week delivery materials with engineering undergraduate students.



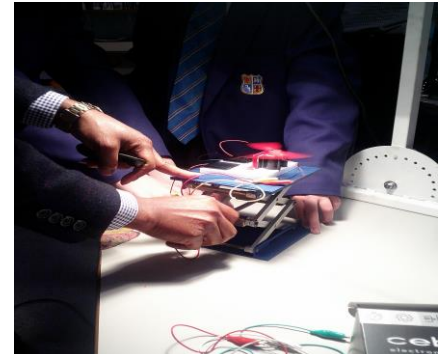
SETechTra virtual partner meeting on 9th September 2021.

Coming soon:

Transnational Project Meetings (TPM) and Multiplier Events (ME), 15th and 16th February 2022, respectively.

ME is designed to disseminate the project results, showcase the teaching materials created and to host a workshop for youth to get to know solar energy systems and how they operate.

Teesside University Team: Successful Schools-Colleges Outreach

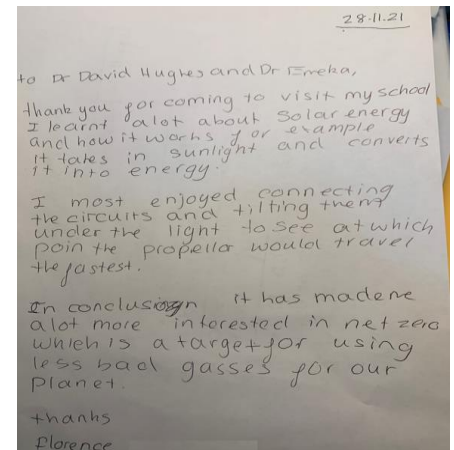


Impact (Examples of feedback)

Dear Dr David Hughes and Dr Emeka Amalu
 Thank you for the amazing presentation it was extremely interesting and informative your work sounds amazing i found out that there's more than one way we can put solar energy into one purpose weather that's propellers big or small to big solar panels on roofs i particularly enjoyed fixing the circuits and wires together and getting to watch our propellers spin this has made me look at solar energy and power in a different light so thank you

During the Solar Energy workshop i found that its not just alarms and tripwires you can make with circuits you can make things spin and twist with the smallest bit of light

Yours Sincerely
 Casey



Intellectual Outputs results highlights

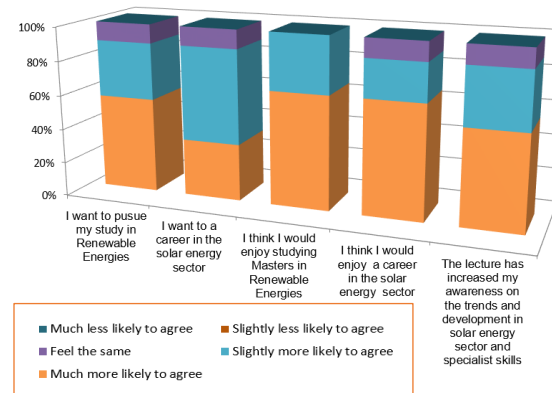
University of Wolverhampton Team: Inspiring and increasing STEM UGs awareness on the trends, development and specialist skills in the Solar energy sector by former students



A former UoW Chemical Engineering UG, now a Master in Energy Environment at the Ecole Polytechnique (X), France, and an Intern at TotalEnergies, gave an inspiring lecture on "Science, Technology and Management of Renewable Energies with focus on Solar PV and Wind Energy".

The exposure of students to successful alumni is also known to contribute to building their confidence and progression.

Impact (Breakdown of students responses to questionnaire about SE/RE lecture)



..... Further comments

The lecture increases my curiosity in renewable energy field

I learnt how solar energy is harvested and its role toward the net-zero economies along with technical challenges such as efficiency and intermittency

I realised the current limitations within the solar PV manufacturing system stem from material properties, high intensity process conditions and inefficiencies within the current national grid I think we will soon see a switch over from traditional PV cells to Perovskite solar cell

I have learnt about solar thermal, thermodynamic solar energy and environmental issue related to wind energy.