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JUMP2Excel
Joint Universal activities for Mediterranean PV
Integration Excellence

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Webinars: PHOTOVOLTAIC TECHNOLOGY PROGRAMME

22-25 September 2020



The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 810809

JUMP2Excel is a twinning project which has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 810809. It aims to step up and stimulate scientific excellence and innovation capacity of MCAST Energy in the field of PV integration including related technologies such as energy storage and ancillary services and electricity markets. This is achieved by joint universal activities with a group of leading research centres, such as the National Renewable Energy Centre of Spain (CENER) and the Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA) in France, together with the University of Manchester (UNIMAN) in United Kingdom, providing access to extensive network and contacts in the field. The activities are mainly knowledge transfer and networking through a series of workshops, winter/summer schools, MRes and PhD programmes, internships, exchanges, meetings and mentoring.



PROGRAMME ORGANIZED BY CENER:

Session 1. September 22nd
12.00-1.00 p.m

- **ELECTROLUMINESCENCE (EL): AN ESSENTIAL TOOL FOR DETECTING AND IDENTIFYING DIFFERENT TYPES OF DEFECTS IN PHOTOVOLTAIC MODULES**

Session 2. September 23rd
12.00-1.00 p.m

- **STANDARDS FOR CERTIFICATION AND CHARACTERIZATION OF PV MODULES**

Session 3. September 24th
12.00-1.00 p.m

- **PV PLANT PROJECT DEVELOPMENT: DESIGN, SOLAR RESOURCE, EPC-O&M CONTRACTS AND WARRANTIES**

Session 4. September 25th
12.00-1.00 p.m

- **POTENTIAL INDUCED DEGRADATION (PID): PHYSICAL ORIGIN, METHODS OF DETECTION, AND APPROACHES TO MINIMIZING IT**

TO REGISTER:

https://forms.office.com/Pages/ResponsePage.aspx?id=tutbJeivRU2sydx93JR5_qgOHgF_1f5DkWmpSDXwg5RURUILNkZTTzkxQIBSWEEwUEhLTIFVMTY2My4u

SESSION 1. ELECTROLUMINESCENCE (EL): AN ESSENTIAL TOOL FOR DETECTING AND IDENTIFYING DIFFERENT TYPES OF DEFECTS IN PHOTOVOLTAIC MODULES



LECTURER: Mr. MIKEL EZQUER



CONTENT

Mikel Ezquer, expert on characterization and diagnosis of the Photovoltaic Solar Energy Department.

He received his MSc in Telecommunications Engineering in 2003 and his Master in Renewable Energy: Electric Generation in 2008 from the Public University of Navarra in Pamplona (Spain). He joined CENER in 2004. He has a wide expertise working on different characterization techniques for solar materials, PV cells and modules, and in the best ways to apply them to identify potential degradation processes that could affect the PV devices. Furthermore, he is specialized in everything related to the electroluminescence (EL) technology, and its application in different fields for the detection and identification of possible defects in PV modules. He has actively participated in national and EU projects and has several contributions in international conferences.

During this presentation, all the aspects related to the electroluminescence (EL) technique will be explained in detail. In this way, the main features of the set-up needed to obtain good quality EL images will be described, not only at controlled indoor conditions in the laboratory, but also to be applied directly on the PV installation. The content of the Standard IEC/TS 60904-13 Ed.1.0 that establishes how to perform this kind of test will be also summarized and outlined.

Moreover, the main kinds of defects that may be present in a crystalline PV module will be described, and how to detect and identify them by using the EL technique.

SESSION 2. POTENTIAL INDUCED DEGRADATION (PID): PHYSICAL ORIGIN, METHODS OF DETECTION, AND APPROACHES TO MINIMIZING IT



LECTURER: Mr. MIKEL EZQUER



Mikel Ezquer, expert on characterization and diagnosis of the CENER'S Photovoltaic Solar Energy Department.

He received his MSc in Telecommunications Engineering in 2003 and his Master in Renewable Energy: Electric Generation in 2008 from the Public University of Navarra in Pamplona (Spain). He joined CENER in 2004. He has a wide expertise working on different characterization techniques for solar materials, PV cells and modules, and in the best ways to apply them to identify potential degradation processes that could affect the PV devices. Furthermore, he is specialized in everything related to the electroluminescence (EL) technology, and its application in different fields for the detection and identification of possible defects in PV modules. He has actively participated in national and EU projects and has several contributions in international conferences.



CONTENT

During the presentation, a complete introduction about the physical origin and development of the Potential Induced Degradation (PID) phenomenon will be included. Besides, the presentation will outline the content of the international Standard IEC/TS 62804-1 Ed-1-2015 that establishes how to carry out the PID detection tests in laboratory, in order to detect the possible susceptibility of the modules to suffer from PID problems in the field. Moreover, the different characterization techniques that can be used to detect the presence of PID problems in the modules will be explained, and the best way to identify through each one of them will be exposed.

SESSION 3. PV PLANT PROJECT DEVELOPMENT: DESIGN, SOLAR RESOURCE, EPC-O&M CONTRACTS AND WARRANTIES



LECTURER: Mr. LUIS CASAJUS



Luis Casajus, Senior Eng. of the CENER'S Photovoltaic Solar Energy Department.

He received his BSc degree in Mechanical Engineering in 2001 and his MSc degree in Risk Prevention Assessment in 2003, both in Public University of Navarra .He is part of the scientific staff at CENER since 2006 as responsible of design and evaluation of photovoltaic installation projects. Also, he has specialized in development of methodology for testing photovoltaic solar trackers after IEC-62817, technical design of photovoltaic module cleaning equipment together with coordination of "Instalaciones Fotovoltaicas" group of CENER.

CONTENT

Review of different steps to dimension, build and operate a photovoltaic plant. Estimations and calculation of solar resource and energy production. Contractual structure of a PV plant project. Main actors in a PV plant project. Good and bad practices.



LECTURER: Mr. ILDEFONSO MUÑOZ



Ildelfonso Muñoz, Senior Eng. of the CENER'S Photovoltaic Solar Energy Department.

He received his BSc in Electrical Engineering in 2000 and his MSc in Renewable Energies & Electric Generation in 2010, both from the Public University of Navarra in Pamplona (Spain). Since June 2003 he is part of the scientific staff at CENER. His main area of expertise is the design and sizing of PV installations (including solar resource and energy production estimation) and the performance evaluation of electronic power converters for PV applications.

SESION 4. STANDARDS FOR CERTIFICATION AND CHARACTERIZATION OF PV MODULES



LECTURER: Mr. JAVIER DÍAZ



Javier Díaz, Senior Eng. of the CENER'S Photovoltaic Solar Energy Department.

MSc in Telecommunications Engineering and 16 years of experience in the field of the Photovoltaic Solar Energy, he participated in the design and start-up of the Photovoltaic Module Testing Laboratory, one of the first laboratories in the world accredited to perform tests for the qualification of crystalline silicon PV modules. He also has participated actively in the extension of the laboratory to other technologies (thin film, concentrator photovoltaics) when the applicable international standards were published.

CONTENT

In this presentation an overview of the certification process of PV modules and related IEC standards will be given focusing on the IEC 61215 and IEC 61730 series which address performance and safety issues respectively. It will also be explained the standardized procedures to correctly measure the maximum power of different PV technologies and main parameters influencing uncertainty assessment (IEC 60904-1). Insights on bifacial characterization according to IEC 60904-1-2.



LECTURER: Ms. ANA BELEN CUELI



Ana Belén Cueli, Senior Eng. of the CENER'S Photovoltaic Solar Energy Department.

After receiving her MSc in Telecommunications Engineering she began the research activity in the field of photovoltaic solar energy at CIEMAT, where she had active participation in national and international EU funded projects. Since June 2001 she is part of the scientific staff at CENER. The main accomplishments at CENER are related to the Photovoltaic Module Testing Laboratory start off and quality accreditations for IEC standards. She is a member of National Subcommittee TC82 for Solar Energy Standardization of IEC.



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Webinars organized by CENER. The **National Renewable Energy Centre of Spain (CENER)** develops applied research in renewable energies, and provides technological support to companies and energy institutions in six areas: Wind Energy, Solar Thermal and Photovoltaic Solar Energy, Biomass, Smart and Efficient Buildings and districts, and Grid Integration of Energy. CENER is a technology centre with worldwide recognised prestige, activity and experience. www.cener.com/en

The aim of **Photovoltaic Solar Energy Department** is to support the industrial sector and to contribute to reducing the costs of kWh produced by PV means. The department is midway between basic research and industrial manufacturing environments. R&D+i activities are complemented with components validation and other certification services, including PV solar plants to generate electricity.





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integration Excellence

Stimulating scientific excellence and innovation capacity of MCAST Energy in the field of Photovoltaic (PV) integration research, as a regional leader.

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A central graphic featuring several yellow circular icons representing various concepts: a person at a podium, a gear with a brain, a group of people, a person with a wheelchair, a building, a clipboard, and a group of people. Below these icons are four large white circles containing the logos of the project partners: MCAST (Malta College of Arts, Science & Technology), The University of Manchester (MANCHESTER 1824), CENER ADitech, and cea (DE LA RECHERCHE À L'INDUSTRIE).

