



Sunday 08/09/2024

18:30

Welcome Happy Hour

Eataly - Piazza XXV Aprile 10, 20121 Milano (MI)

1st day: Monday 09/09/2024

Raw Materials

8:30-9:00	Registration of participants
9:00 – 10:00	<p>Raw materials issues</p> <p>(Benjamin Maloney, EIT Raw Materials)</p> <p>General introduction on the classification of raw materials into essential, critical, and strategic categories, focusing on the importance of raw material availability, supply chains, and geopolitical considerations.</p>
10:00 – 10:30	Coffee break
10:30 – 12:00	<p>The role of critical and strategic materials in current and future PV</p> <p>(Vanni Lughì, UNITS)</p>
12:00 – 12:30	<p>Raw materials in PV power processing systems</p> <p>(Giovanni Spagnuolo, UNISA)</p>
12:30 – 13:00	<p>Life Cycle Assessment (LCA) in electronics</p> <p>(Luca Ragusa, BITRON)</p>
13:00 – 14:30	Lunch
14:30 – 15.30	<p>Why the LFP Battery is a Safe Choice for Solar Energy Storage</p> <p>(Bernardo Barbiellini, ELMO-LION Summer School)</p>
15.30 – 16.30	<p>Presentation of the Work Project: work organisation and working group formation</p> <p>(led by ERION)</p>
16.30 – 18.30	Groups working on the project



2nd day: Tuesday 10/09/2024

Manufacturing

- 9:30 – 10:30 **Introduction to the manufacturing process of PV cells and modules**
(Torsten Büchner, Anhalt University of Applied Sciences)
- 10:30 – 10:45 **Coffee break**
- 10:45 – 12:00 **Industry lectures about cell and module manufacturing**
(Hamed Hanifi, Director of Research and Development AE Solar - Nicola Baggio, Project Director of FuturaSun)
- 12:00 – 13:30 **Lunch**
- 13:30 – 15:00 **Introduction PV system modelling and diagnostics**
(Carlos Meza, Anhalt University of Applied Sciences – Stephanie Malik, Fraunhofer CSP/IMWS - Kai Kaufmann, COO DenkWeit - Dominik Lausch, CEO DenkWeit)
- 15:00 – 17:00 **HANDS on TRAINING: PV system modelling and diagnostics**
(Hochschule Anhalt)

Identification of PV faults using Visual inspection, UV-fluorescence, Magnetic field imaging and Thermal imaging; tutorial on how to model and analyse a PV system for diagnosis using Python libraries such as Pandas, PVLib, and other data-science libraries.
- 17.00 – 18.30 **Groups working on the project**
- 20.00 **Social Dinner**

3rd day: Wednesday 11/09/2024

Recycling

- 8:30 – 9:00 **Photovoltaic panel circular value chain: “end-of-life” focus**
(Emiliano Tulusso, Erion)
- 9:00 – 10:00 **The PV landscape in Italy, forecasting of PV waste generation in the future decades, the status of the photovoltaic panels' collection, and Italian/EU Regulations (Policy and Regulatory Frameworks)**
(Emiliano Tulusso and Francesca Fattori, Erion)



- 10:00 – 10:30 **Coffee break**
- 10:30 – 11:30 **The pre-treating and recycling phase: assessing currently available methodologies and technologies**
(Pietro Giovanni Cerchier, 9-TECH)
- 11:30 – 12:00 **The "closing the loop" phase: reintroduction on the market of output secondary raw materials. Ongoing European projects on the topic**
(Emiliano Tolusso and Giulia di Mari, Erion)
- 12:00 – 12:30 **Lunch**
- 14:00 – 18:00 **Visit to WEEE management plant and PV modules (Feragame S.r.l., Broni) + cultural trip (guided visit to Certosa di Pavia)**

4th day: Thursday 12/09/2024

Technological Innovations and Emerging Materials

- 9:00 – 9:30 **Sustainability of the materials for DSSC**
(Matteo Bonomo, UNITO)
- 9:30 – 10:30 **Sustainable implementation of DSSC on the industrial scale**
(Pauline Chotard, G-LYTE France)
- 10:30 – 11:00 **Coffee break**
- 11:00 – 12:00 **Raw material in Chalcogenide-based solar cells**
(Philip Dale, University of Luxemburg)
- 12:00 – 13:00 **Sustainability of the materials in Perovskite solar cells**
(Aldo Di Carlo, University of Tor Vergata)
- 13:00 – 14:00 **Lunch**
- 14:00 – 15:00 **LCA of emerging solar cells**
(Maria Laura Parisi, Università di Siena)
- 15:00 – 15:30 **Coffee break**
- 15:30 – 18:30 **Groups working on the project**



5th day: Friday 13/09/2024 lab to market

Lab-to-market and final evaluation of the project

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| 9:00 – 11.00 | The support of EIT RawMaterials to business creation: Jumpstarter and Lab2Market programmes

(Benjamin Maloney, EIT Raw materials) |
| 11.00 – 12.00 | The journey from PhD research into a deep technology startup: insights, discussions, and case studies

(Riam Kanso, ConceptionX) |
| 12.00 -13.00 | Testimonial from Startup in solar value chain: Bright Futures, the path to solar panel sustainability

(Matteo Stoppa, KeepTheSun and COESA srl) |
| 13:00 – 17:00 | Lunch, poster presentation of the projects realised by the students and award ceremony |
| 17:00 | Closing of the school |