Funded by the
Erasmus+ Programme
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Capacity Building in Higher Education

Valahia University of Targoviste

Training of Trainers

REPORT

of the meetings held on 24-25 February 2023

prepared by

Gabriela Mantescu

gabriela.mantescu@valahia.ro

March, 2023

Executive summary

Responsible: dr. Gabriela Mantescu, Local Coordinator/THREE Lanka Project

Locations: RACARI, TARGOVISTE & BUCHAREST, Romania

Dates: -February 24, 2023 - *Measurement, Tests, Design and Energy Management;*

-February 25, 2023 – *Economic aspects, opportunities and challenges regarding the use of technologies based of biomass, biogas and hydrogen*

Objective:

The Training of Trainers (ToT) organized by the Valahia University of Targoviste had the purpose to train the members of the THREE Lanka Project team, as master trainers, with specific subjects or competences of the LMS developed within the European Project "Training Hub for Renewable Energy Technologies in Sri Lanka".

Date of Report – February 24, 2023	
Names of the Visits: (The first locations)	- 110/20 kV Mavrodin Transformer Station, located near the Racari city, Dambovita district; - Colacu Photovoltaic Plant of 2.5 MW, located near the Mavrodin village; - GE's Jenbacher Electric Gas Generators, Set of 3,35 MW, located near the Racari city, Dambovita district;
Team coachers:	- Eng. Vasile DRAGUSIN, General Director, BIT Invest S.R.L.; - Dr. Florin Batrinu; - Prof. Nicolae Olariu, Valahia University of Targoviste; - Prof. Gabriel Gorghiu, Valahia University of Targoviste; - Eng. Manuela Draghicescu, Director, New Energy Sources Employers' Association (SUNE).
Team members to be coached:	- Prof. Prasanna Gunawardane, University of Peradeniya, Sri Lanka; - Prof. Sujeewa Nilendra Hettiwatte, Sri Lanka Instutute of Information Technology, Sri Lanka; - Dr. Udayanga Gallappaththi, University of Ruhuna, Sri Lanka; - Dr. Muditha Kulatunga, Glasgow Caledonian University, United Kingdom.

Local training and visits at power energy stations: the 110/20 kV Mavrodin Transformer Station and GE's Jenbacher Electric Gas Generators, Set of 3,35 MW.
Photos source: Personal archive of prof. Gabriel Gorghiu

Local training and visits at the Colacu Photovoltaic Plant of 2.5 MW.
Photos source: Personal archive of prof. Gabriel Gorghiu

Discussions and recommendations after the local training and visits
at Colacu Photovoltaic Plant of 2.5 MW. Photos source: Personal archive of prof. Gabriel Gorghiu

Names of the Visits: (The second locations)	- Valahia University Campus, Targoviste - Laboratories of the Institute for Multidisciplinary Research for Science and Technology from Valahia University of Targoviste
Team coachers:	- Dr. Gabriela Mantescu, Valahia University of Targoviste; - Dr. Radu Lucian Olteanu, Valahia University of Targoviste; - Dr. Viorel Miron Alexe, Valahia University of Targoviste; - Dr. Liviu Olteanu, Valahia University of Targoviste; - Drd. Marius Adrian Paun, Valahia University of Targoviste; - Prof. Nicolae Olariu, Valahia University of Targoviste - Dr. Dorin Let, Valahia University of Targoviste; - Dr. Alin Bucurica, Valahia University of Targoviste;
Team members to be coached:	- Prof. Prasanna Gunawardane, University of Peradeniya, Sri Lanka; - Prof. Sujeewa Nilendra Hettiwatte, Sri Lanka Instutute of Information Technology, Sri Lanka; - Dr. Udayanga Gallappaththi, University of Ruhuna, Sri Lanka; - Dr. Muditha Kulatunga, Glasgow Caledonian University, United Kingdom.
List of Participants is presented in the Annex 2.	

The Institute for Multidisciplinary Research for Science and Technology (ICSTM) from Valahia University of Targoviste. Photos source: Personal archive of dr. Gabriela Mantescu

Welcome of foreign guests from Sri Lanka and United Kingdom at the Institute of the Multidisciplinary Research for Science and Technology (ICSTM).
Group photo with the Scientific Director, dr. Ioana daniela Dulama.
Photos by dr. Alin Bucurica. Source: Personal archive of dr. Gabriela Mantescu

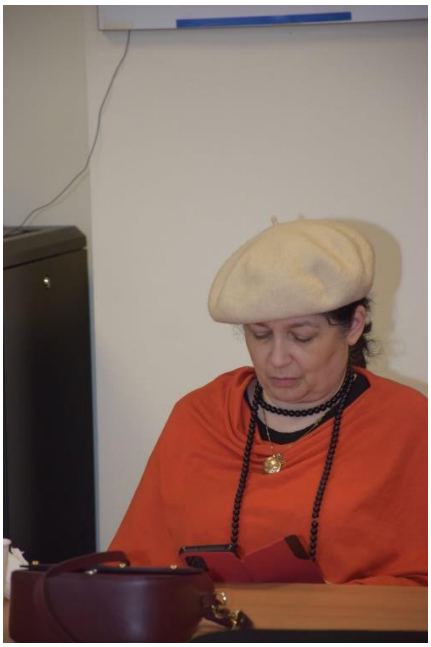
Auditorium at the professional presentations. Photos by dr. Alin Bucurica.
Source: Personal archive of dr. Gabriela Mantescu

- Dye sensitive solar cell, dr. Radu Olteanu
- PV cell solar simulator: I-V characteristic, dr. Viorel Miron Alexe
- PV modules prototyping station; dr. Liviu Olteanu
- Solar Simulator — PV module testing, drd. Marius Paun & dr. Gabriela Mantescu
  Visual presentations are available on UVT – Google Drive

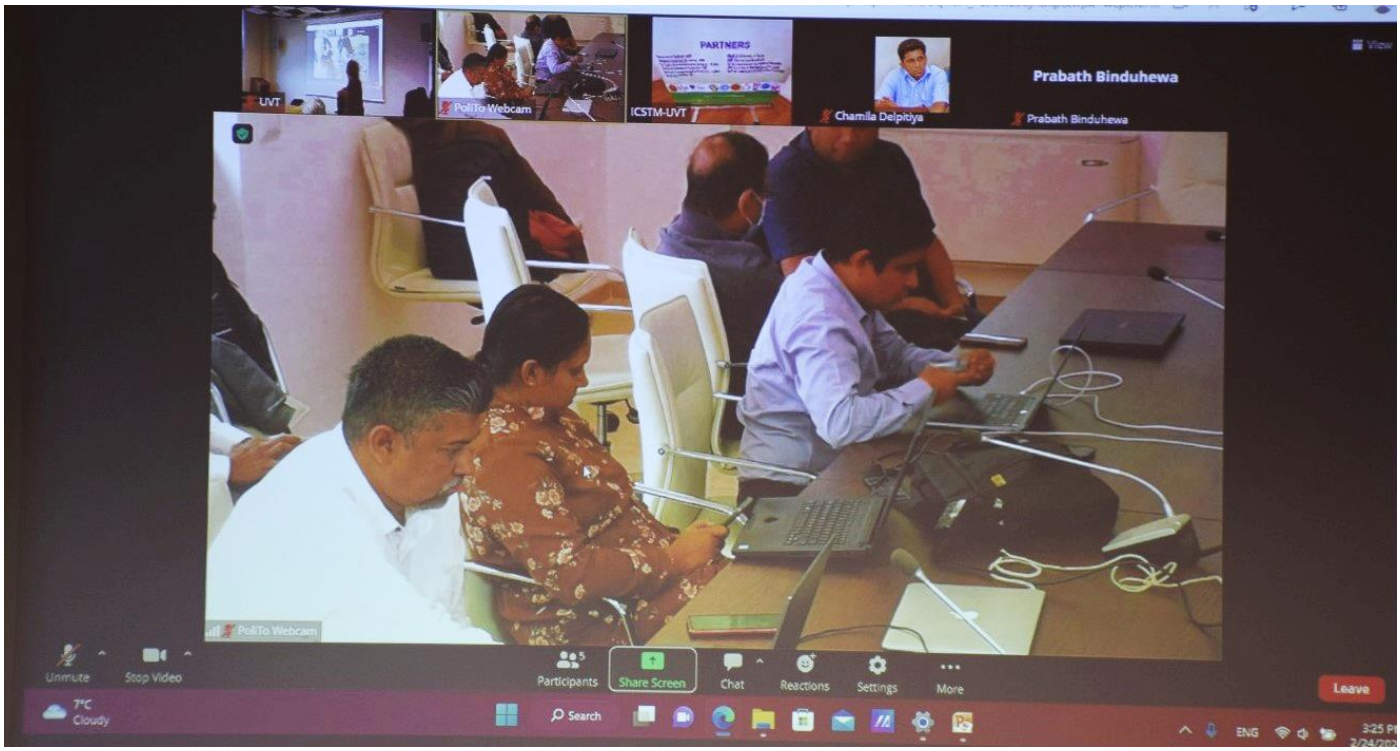
Experiments with different solar cell connections.
Demonstration of measuring solar radiation using the Kipp & Zonen CM21 Pyranometer and data recorded on the mobile phone.
Photos by dr. Alin Bucurica. Source: Personal archive of dr. Gabriela Mantescu

Explanations on how can be obtained a solar cell I-V characteristics, with an experimental Solar Kit or, with the professional Solar simulator.
Photos by dr. Alin Bucurica. Source: Personal archive of dr. Gabriela Mantescu





Impressions, recomandations and observations.
Photos by dr. Alin Bucurica. Source: Personal archive of dr. Gabriela Mantescu



Online participation in the UVT ToT of the Sri Lankan colleague, thanks to the support offered by the Politecnico di Torino Project Partners, prof. Gianfranco Chicco, prof. Filippo Spertino and dr. Alessandro Ciocia. Photos by dr. Alin Bucurica.
Source: Personal archive of dr. Gabriela Mantescu

Observations

- The ToT scheduled at Valahia University of Targoviste was carried out in physical format for the participants present at the meeting and online for all THREE Lanka Project colleagues.

- The theme of the training, structured under the vision of the "Sri Lanka 2030" strategy, was supported by explanations and visual presentations dedicated to the realization of photovoltaic systems integrated into the built environment, starting from the realization of a single solar cell to the design, control, operation and maintenance of the solar system.

- Finally, a visit through the ICSTM Institute to the energy.

Date of Report – February 25, 2023	
Names of the Visits: (The third location)	- Cismigiu Hotel, Bucharest
Organizator:	- Valahia University of Targoviste, Romania; - Advanced Technology Systems, Romania - New Energy Sources Employers' Association (SUNE), Romania.
Team coachers:	- Prof. Nicolae Olariu, Valahia University of Targoviste, Romania; - Dr. Ioana Andreea Stefan, Advanced Technology Systems, Romania; - Prof. Jannicke Baalsrud Hauge, KTH & BIBA, - Dipl. Eng. Hans Marius Schuster, Arena Innovation, Germany - Prof. Gabriel Gorghiu, Valahia University of Targoviste, Romania; - Eng. Manuela Draghicescu, Director, New Energy Sources Employers' Association (SUNE), Romania. - Dr. Gabriela Mantescu, Valahia University of Targoviste, Romania.
Team members to be coached:	- Prof. Prasanna Gunawardane, University of Peradeniya, Sri Lanka; - Prof. Sujeewa Nilendra Hettiwatte, Sri Lanka Instutute of Information Technology, Sri Lanka; - Dr. Udayanga Gallappaththi, University of Ruhuna, Sri Lanka; - Dr. Muditha Kulatunga, Glasgow Caledonian University, United Kingdom.
Visual presentations	- Introducing renewable energy in production and logistics operation. What's in it for the companies and the society? Jannicke Baalsrud Hauge - H2 Metaverse – a standardized European Data Space and Industry 4.0 Digital Twin Asset Administration Shell (AAS) for the Renewable and Clean Hydrogen Domain Dipl. Ing. Hans Marius Schuster

	- Energy and Biochar Production without Residues and with Negative Carbon Footprint from Residual Vegetable Agricultural Biomass Manuela Draghicescu & Murad Erol, SUNE; - Cutting-edge science topics for green education and possibilities for its implementation Prof. Gabriel Gorghiu - Best practices and lessons learnt from the SHREC Project—Shifting towards Renewable Energy for Transition to Low Carbon Energy Ioana Andreea Stefan

Auditorium at the Conference Room. The opening of the works by Prof. Nicolae Olariu
Photos by prof. Gabriel Gorghiu. Source: Personal archive of dr. Gabriela Mantescu

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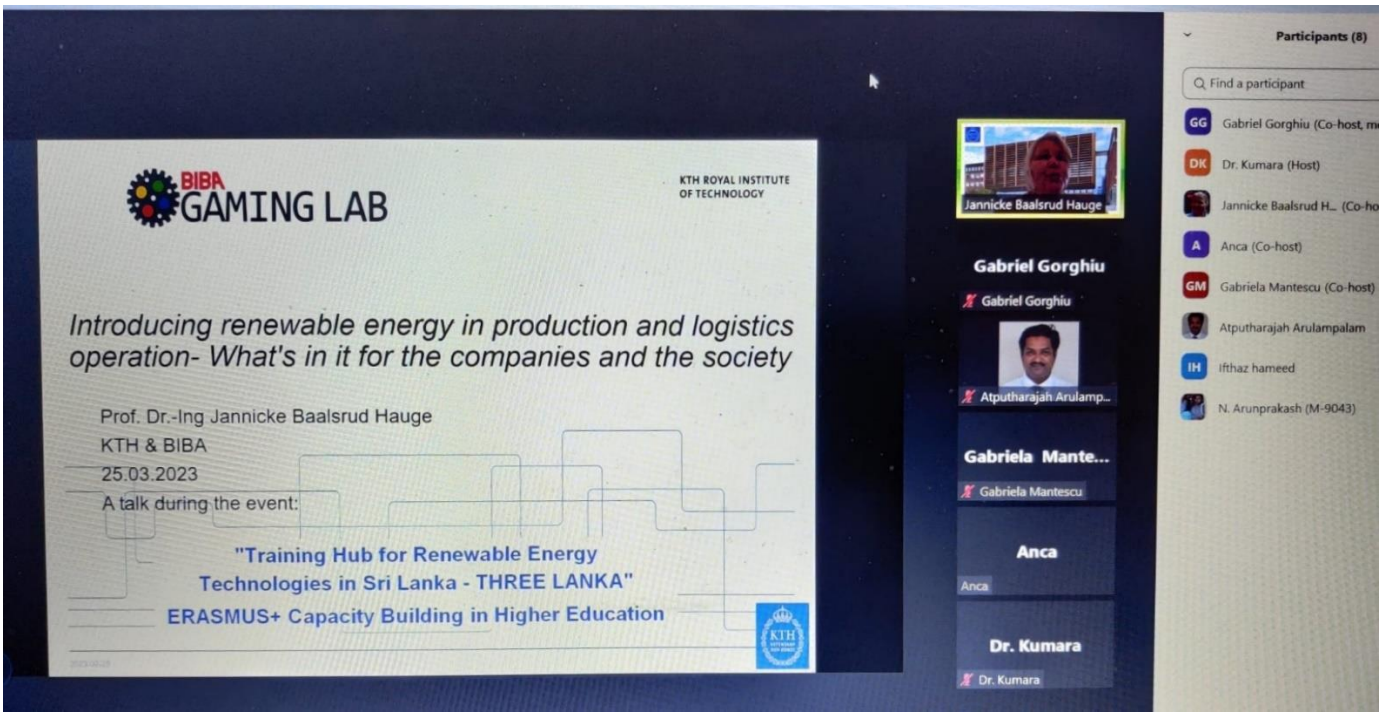
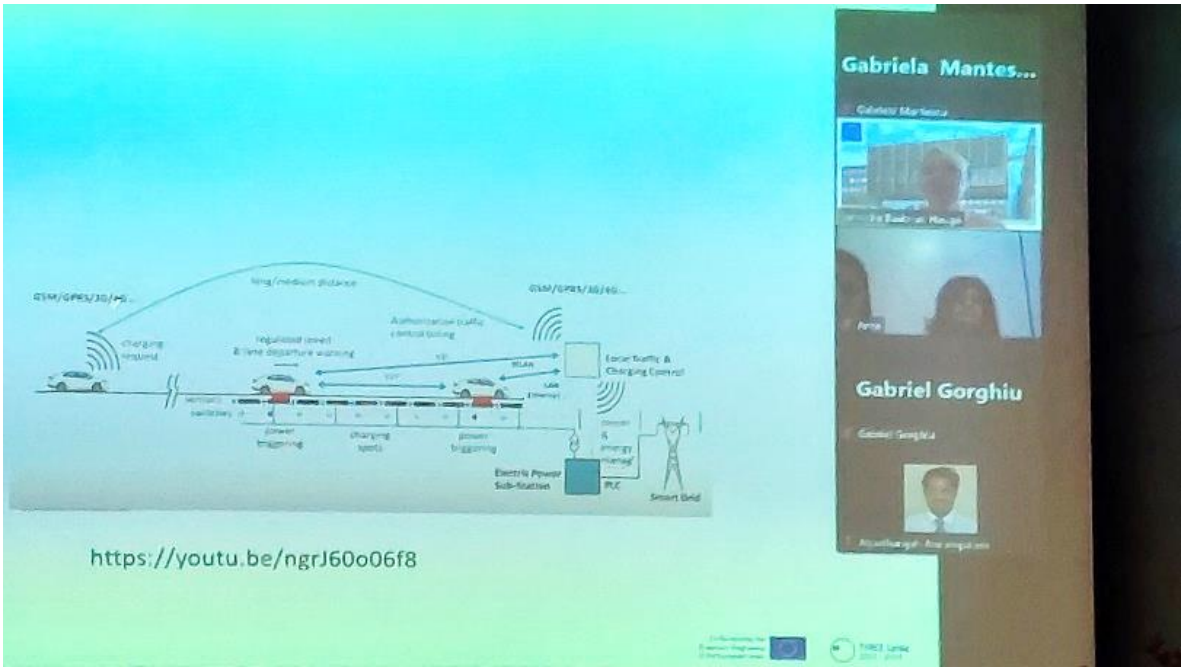
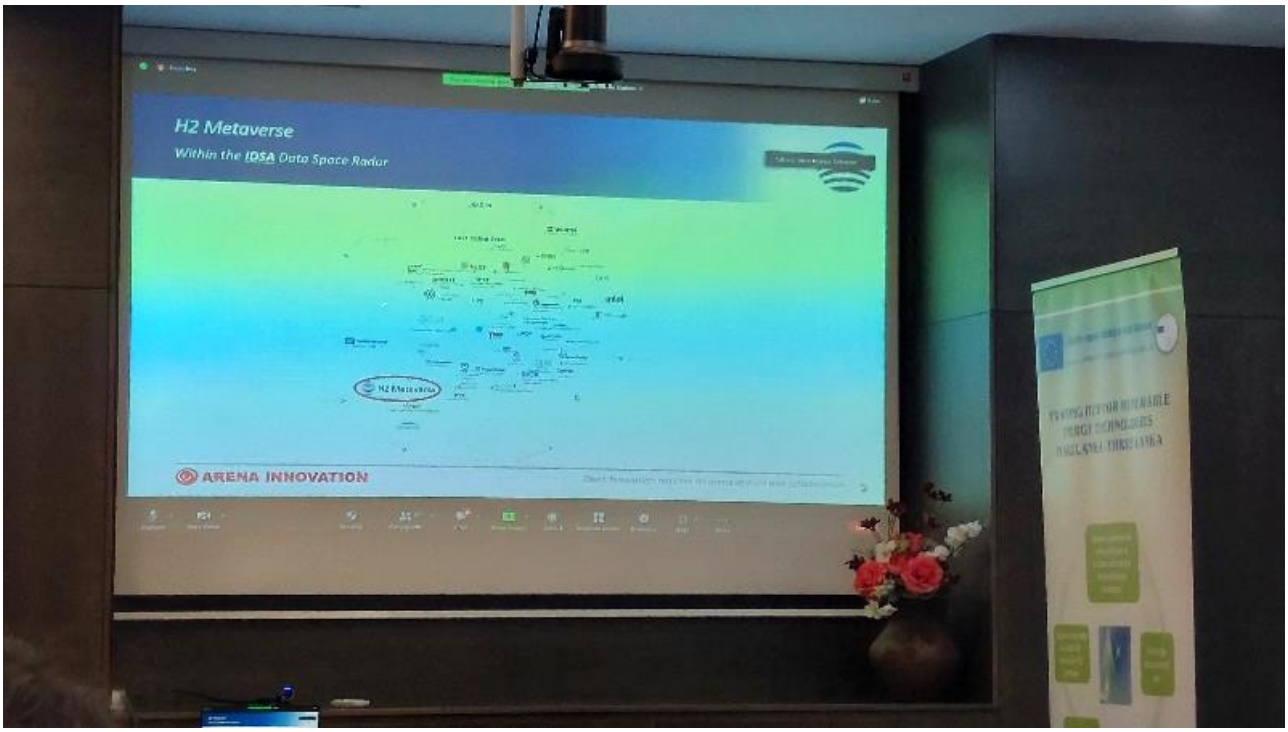


Professional presentations. Photos by prof. Gabriela Mantescu
Source: Personal archive of dr. Gabriela Mantescu

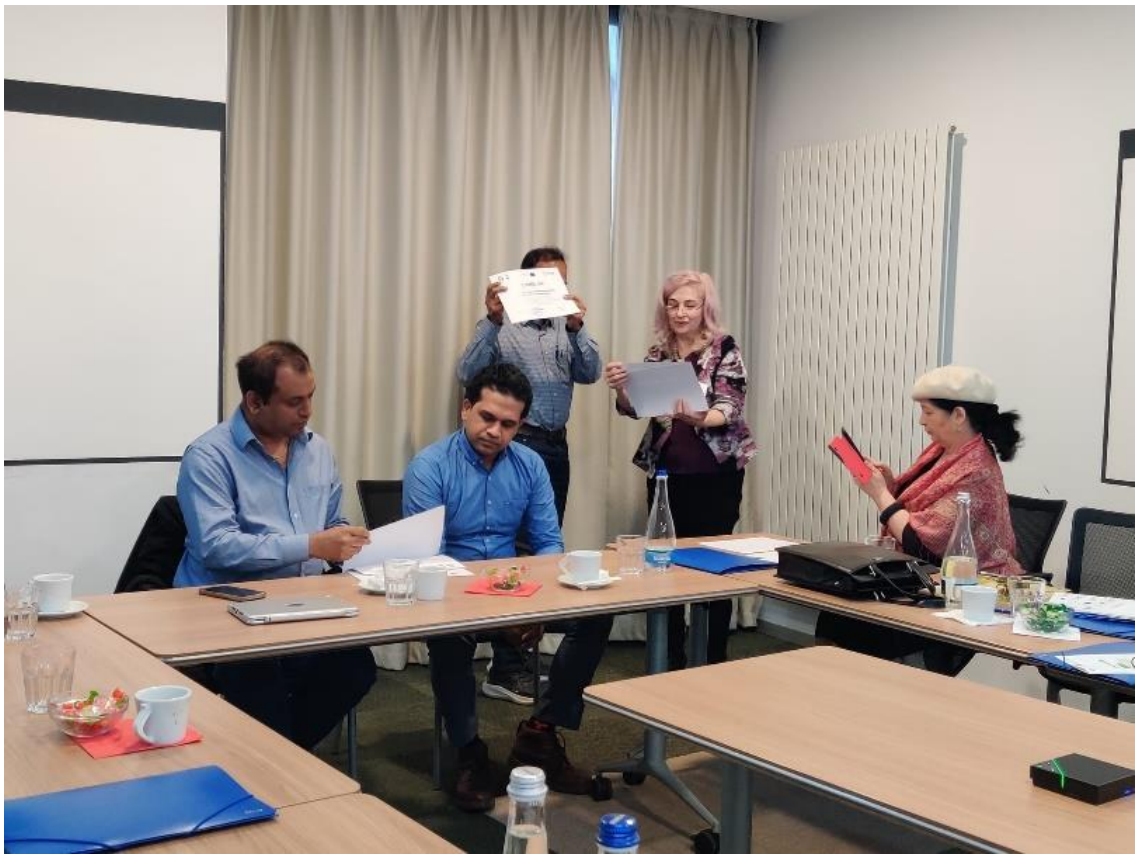


Discussions in the context of the visual presentations. Photos by prof. Gabriela Mantescu
Source: Personal archive of dr. Gabriela Mantescu



The future of H2 Socciety – H2 Metaverse
Source: Personal archive of dr. Gabriela Mantescu

Cutting-edge science topics for green education and possibilities for its implementation.
Source: Personal archive of dr. Gabriela Mantescu



Awarding certificates to all participants, physically or online involved in the UVT ToT.
Source: Personal archive of dr. Gabriela Mantescu

Groupe photos, online and physical participants.
Source: Personal archive of dr. Gabriela Mantescu

Conclusions

- The training meetings held in the period of February 24-25, 2023 aimed at a better understanding of all the components of a generator that uses renewable energy sources. The energy power stations near Racari city were a clear proof of the fact that renewable technologies and their applications are in continuous evolution.

- The presentation of the processes of obtaining solar cells, of executing photovoltaic modules for different prototypes and applications, of testing PV cells and PV modules had the role of familiarizing future trainers with the possibilities of approaching different aspects of work in the energy sector, regarding design, installation, monitoring and maintenance of solar systems.

- During the visit into the ICSTM Institute, the participants in the UVT ToT had the opportunity to state of arts equipment specific to the renewable energy sector.

- It is very important to create a bridge of connection and simultaneous collaboration between the environment of education, research and business environment in order to achieve quick results and harmonious development. We hope that, thanks to the actions carried out within this project, we have opened these gates for the future.

Acknowledgments

UVT wishes to thank all those involved and responsible for the organization and smooth running of the training activities in Romania;

Best wishes goes to to the representatives of the companies BIT Invest and Advanced Technology Systems, New Energy Sources Employers' Association - SUNE, Cismigiu Hotel and last but not least, to all the Romanian and foreign colleagues participating in the training actions.

"Training Hub for Renewable Energy Technologies in Sri Lanka - THREE LANKA"

ERASMUS+ Capacity Building in Higher Education

Organizer

Valahia University of Targoviste

Aleea Sinaia, no.13, Targoviste,

Romania

Co – organizer

SUNE—Employer's Association of New Energy Sources

Spaiul Unirii, no. 313, Bucharest

Romania

Co-founded by the Erasmus+ Programme of the European Union

PROGRAM

Training of Trainers

VALAHIA UNIVERSITY OF TARGOVISTE

ROMANIA, 24-25 FEBRUARY 2023

SOLAR TECHNOLOGIES

Measurements, Tests, Design and Energy Management

Targoviste, February, 24, 2023

Hours	Activities
09:00 – 09:15	Registration of participants, Cismigiu Hotel, Bucharest
09:15 - 10:30	Travel to Racari
10:-30 - 11:45	Training at the Photovoltaic Park, Racari. Visit to a gas installation under development
11:45– 12:45	Travel to Targoviste
13:00 – 14:00	Lunch
14:00 – 14:15	Solar radiation measurement dr. Gabriela MANTESCU
14:15 - 14:30	Dye sensitive solar cell dr. Radu OLTEANU
14:30 - 14:40	PV cell solar simulator: I-V characteristic dr. Viorel MIRON ALEXE
14:40 - 14:50	PV modules prototyping station - dr. Liviu OLTEANU
14:50 - 15:00	Solar Simulator — PV module testing drd. Marius PAUN & dr. Gabriela MANTESCU
15:00 - 15:15	Solar systems design and simulation. PVSol and TSol Software dr. Gabriela MANTESCU
15:15 – 15:30	Coffee break
15:30 – 16:30	Interactive visit: ICSTM laboratories and RES systems dr. Dorin LET & dr. Alin BUCURICA
16:30 – 17:00	Conclusions and recommendations
17:00	Dinner
18:00	Travel to Bucharest

SUSTAINABLE ENERGY

Economic aspects, opportunities and challenges regarding the use of technologies based on biomass, biogas and hydrogen

Bucharest, February 25, 2023

Hours	Activities
09:45 - 10:00	Registration of participants, Cismigiu Hotel, Bucharest
10:00 - 10:10	Session opening CERMAND Cluster, UVT, Employers' Association of New Energy Sources, SUNE Prof. Nicolae OLARIU, UVT
10:10– 10:40	Cutting-edge science topics for green education and possibilities for its implementation Prof. Gabriel GORGHIU, UVT
10:40– 11:10	Introducing renewable energy in production and logistics operation—What's in it for the companies and the society? Jannicke Baalsrud Hauge
11:10 – 11:15	Coffee break
11:15 – 11:45	H2 Metaverse – a standardized European Data Space and Industry 4.0 Digital Twin Asset Administration Shell (AAS) for the Renewable and Clean Hydrogen Domain Dipl. Ing. Hans Marius SCHUSTER, ARENA INNOVATION, Germany
11:45– 12:15	Energy and Biochar Production without Residues and with Negative Carbon Footprint from Residual Vegetable Agricultural Biomass prof. Murad EROL, SUNE
12:15– 12:45	Best practices and lessons learnt from the SHRECProject—Shifting towards Renewable Energy for Transition to Low Carbon Energy Dr. Ioana Andreea STEFAN, Advanced Technology Systems
12:45 – 13:00	Session closing. Conclusions and recomandations
13:00 – 14:00	Lunch
14:30 – 15:30	Visit to the "Casa Poporului"

"CISMIGIU" Park

The Palace of the Parliament—"Casa Poporului"