



# FIRST INTERNATIONAL CONFERENCE ON SUSTAINABLE ENERGY SYSTEMS

24 - 25, & 26 APRIL

# 2025

Morocco (Online)

Conference Proceedings

AIP Publishing

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# PROGRAM & USEFUL INFORMATION



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## Welcome message

Dear Respectful Academicians, Researchers, graduate students

On behalf of the chairmen and organizing Committee of the **1st International Conference on Sustainable Energy Systems – Online/Remote Edition**, and as the General Chair of this 1st International Conference - 2025, we cordially invite you to participate and discuss the latest achievements in the advanced field of Sustainable Energy Systems, and related Technological Advancement in the Engineering.

We are confident that this **1st Remote Edition -2025** will be a platform to the participants from industries and academic institutions to share their thoughts and views, bring new ideas and concepts in good agreement with energy transition in our country. Such event is necessary for graduate students to follow up the latest developments in the key areas of Renewable and Sustainable Energy and to **establish scientific networks for research collaborations**.

We hope that you will be online, and you could stimulate a creative exchange of ideas. With your participation, we are willing to make this 1st International Conference-2025, a great success.

Please stay safe, healthy. Thanking you, we remain.

Sincerely,

**Prof. Ahmed ENNAOUI on behalf of organizing committee**

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*President of The Scientific Council of IRESEN, Morocco*

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*Chouaïb Doukkali University,  
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*Corporate Fellow & Head of Electrification Section  
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*Researcher Green Energy Park - IRESEN*

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# PROGRAM AT A GLANCE - ICOSES'25





## DAY 1 / 24, APRIL 2025

TIME ZONE	WELCOME AND INTRODUCTION / ICOSES'25	
 08:30-09:00		<p>Prof. Ahmed ENNAOUI, President of The Scientific Council of IRESEN, Morocco</p>
		<p>Prof. Az-eddine AZIM, President of Chouaïb Doukkali University, Morocco</p>

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		<b>Prof. Hafid SABER</b> , Dean of the Faculty of sciences El Jadida, Morocco

08:30-09:00

**Prof. Dr. Markus Holz**, Vice-President for Research, Transfer, and Sustainability, Anhalt University of Applied Sciences, Germany

**Mohammed El Rhabi**, Directeur général de l'École marocaine des sciences de l'ingénieur (EMSI)

**Prof. Hafid SABER**, Dean of the Faculty of sciences El Jadida, Morocco








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## P L E N A R Y   S E S S I O N (DURATION 30MIN. INCL. Q/A DISCUSSION)






Moderator: Prof. Ahmed ENNAOUI & Prof. Abdelilah BENYOUSSEF

 <p>09:00-09:30</p>		<p><b>Prof. Ismael SAADOUNE</b>, Mohammed VI Polytechnic University, Applied Chemistry &amp; Engineering Research, Morocco.</p> <p><i>Title: Recent Progress in Li- and Na- Phosphate-Based Electrodes for High- Efficiency Li- and Na-Ion Batteries</i></p>
  <p>09:30-10:00 10:30-11:00</p>		<p><b>Prof. Mohammad KHAJA NAZEERUDDIN</b>, Swiss Federal Institute of Technology in Lausanne, EPFL, Switzerland.</p> <p><i>Title: Stable and Efficient Perovskite Solar Cells and Modules by Compositional and Interface Engineering</i></p>
 <p>10:00-10:30</p>		<p><b>Dr. Jauad EL KHARRAZ</b>, Senior manager, Expert, scientist and advisor in the fields of sustainable development, energy transition, water policies, desalination, and science diplomacy</p> <p><i>Title: Water-Energy nexus: A pathway towards sustainability and Net-Zero</i></p>

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 	<p>10:30-11:00</p> <p>11:30-12:00</p>		<p>Dr. Diego MARTÍNEZ PLAZA, Managing Director at EU-SOLARIS ERIC</p> <p><i>Title: Concentrating Solar Thermal technologies: A reliable player to the global energy transition</i></p>
	<p>11:00-11:30</p>		<p>Dr. Kawtar Benabdelaziz, Senior Project Manager a Gopa Consulting Group</p> <p><i>Title: Innovations and Challenges in the Transition to Electric and Sustainable Mobility: Technological and Strategic Perspectives</i></p>

## FOR PARTICIPANTS: Session 1

12:00-13:30

Poster (Parelle sessions)

**Topic 1: PV Technology**

**Subtopic 1.1: Photovoltaic Materials and New Concepts**

Session chair: Prof. Adil Charef, Dr. Hasnae Saadi @ Prof. Mustapha Rouchdi

ID	Title & Authors
7	<p><b>Title: Electrodeposition of SnSe Nanosheets: Effect of Deposition Potential on Structural, Morphological, and Optical Properties</b></p> <p>Abdessamad EL KANOUNY, R. ELOTMANI, A. EL MANOUNI, A. ALMAGGOUSI, O. EL KHOUJA, A.C. GALCA</p>
11	<p><b>Title: The Effect of Anisotropy in Thermoelectric Materials on Leg Design</b></p> <p>Asma Rguibi</p>

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17	<p><b>Title: Synthesis, structural investigation, and optical characteristics of a novel lead-free organic-inorganic hybrid perovskite, (C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>NH<sub>3</sub>)<sub>3</sub>BiCl<sub>6</sub>·3H<sub>2</sub>O</b></p> <p>Chaymae srati, Fatima Zahra Ahjyaje, Najiba El Idrissi El Amrani, Najwa Gouitaa, Taj-edine Lamcharfi, Jamil Toyir</p>
26	<p><b>Title: Impact of Magnesium doping on the structural and optical performance of BT ceramics</b></p> <p>MOHAMMED BOUZID, Abdelhalim El basset, Lemziouka Hammame, Abdelilah Rjeb, Rachid Ahfir</p>
49	<p><b>Title: Optimization and Characterization of Thin-Film Materials for Enhanced Photovoltaic Performance</b></p> <p>hafsa saf, Hicham Charifi, Khalid Bouabid, Haytam Mouhib, Mariam Boufrioua</p>
61	<p><b>Title: First-principles calculations of structural, electronic and optical properties of undoped and Ag doped Sb<sub>2</sub>S<sub>3</sub> using density functional theory</b></p> <p>Mustapha Madi</p>
62	<p><b>Title: The Optoelectronic Properties of Carbazole for Advanced Photovoltaic Applications.</b></p> <p>Oumaima El Ouardi, Brahim Fakrach, et Hassan Chadli</p>
74	<p><b>Title: Efficient thiophene-based hole transport materials containing Amide groups as bridges and thiophene derivatives as acceptors for perovskite solar cells</b></p> <p>Abdelali Staoui, abdennacer idrissi</p>
95	<p><b>Title: The Secrets of Branched Alkyl Chains in Organic Semiconductors</b></p> <p>Majda Elgridani, Youssef Berghoute</p>
102	<p><b>Title: Enhancing the efficiency of MAPbI<sub>3</sub> perovskite solar cells through a numerical analysis using TiO<sub>2</sub>/ZnO bilayer ETLs.</b></p> <p>khadija BOUGHANBOUR, Mustapha SAHAL , Essaadia OUBLAL</p>
126	<p><b>Title: Electrodeposition-Based Optimization of Structural, Morphological, and Optical Properties of Thin Films for Photovoltaic Energy Conversion</b></p> <p>Sana BOUTAGOUNT, Abdeslam EL FANAOU, Bahcine BAKIZ, Abdeljalil BENLHACHEMI and Ahmed Ihlal</p>
135	<p><b>Title: Experimental and DFT Study of the Electronic and Optical Properties of SnO<sub>2</sub> Thin Films</b></p> <p>Saaida BAUBIH, S. BAUBIH, A. Elfanaouia, R. Leghribb, A. Soussia</p>

137	<p><b>Title: Structural, linear and nonlinear Optical properties of Ba doped Fe<sub>2</sub>O<sub>3</sub> Thin Films Deposited by Spray Pyrolysis Method</b></p> <p>Mariam MOUSTAINE, Khadija BAHEDI, Zaid ROSSI, Khalid BOUABID, Mohamed ADDOU, Ahmed Soussi</p>
193	<p><b>Title: Use of Graphene as an Interlayer to Optimize CTS Thin Film Properties: The Role of Sulfurization Temperature</b></p> <p>Sevde ERKAN, Yavuz Atasoy, Mehmet Ali Olğa, Recep Zan</p>
<p><b>Topic 2: CSP Technology</b></p> <p><b>Topic 6: Batteries and Energy Storage Systems</b></p> <p><i>Session chair : Prof. Ayoub Nouaiti @ Dr. Younes Boujoudar @ Prof. Hicham Ben Sassi</i></p>	
<b>ID</b>	<b>Title &amp; Authors</b>
45	<p><b>Title: Study of Natural Convection and Heat Transfer Enhancement Using Hybrid Nanofluids in a Two-Dimensional Enclosure</b></p> <p>Ilham Lahlal, Fatima-Zahra Barhdadi; Ikrame Jamal, Salah Daoudi</p>
60	<p><b>Title: Advances in Thermal Energy Storage for Sustainable Energy Systems Using CFD simulation</b></p> <p>Brahim ADDOU, Abdessamad BALOUKI, Abderrahim BEN RICHOU</p>
192	<p><b>Title: Numerical Analysis of PCM Mass Influence on Solar Still Productivity Under Agadir's Climatic Conditions</b></p> <p>Chaimae KANTAOUI, M'barek FEDDAOUI, Khadija ZABOUR</p>
10	<p><b>Title: Optimization of Energy Harvesting in a Nonlinear Oscillator with Time Delayed Piezoelectric Coupling</b></p> <p>Zakaria Ghouli</p>
27	<p><b>Title: Optimized Active Balancing of Series-Connected Cells using Switched Capacitor with Buck-Boost Converter for Charge and Discharge Management</b></p> <p>Assia Redouani, Kamal Zared, and Najiba El Amrani El Idrissi</p>
50	<p><b>Title: An Experimental Investigation of falling film evaporation over a vertical plate</b></p> <p>Hayat EL BAAMRANI, Abdelaaziz Yagourb, Aicha Eddemani, Ahmed Aharoune , Abdallah Boukhris</p>

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57	<b>Title: Building thermal system model modelling</b> HAMZA BOUABID
58	<b>Title: Magnetic properties and half metallic behavior of the Full-Heusler Co<sub>2</sub>MnGe alloy: DFT and Monte Carlo studies</b> ELHANI AHMED
77	<b>Title: Advanced Thermal Modeling of Lithium-Ion Batteries: A Framework for Capacity Prediction and Safety Enhancement</b> abdelhadi elkake, El Mehdi Laadissi, Abdelhakim Tabine, Abdelowahed Hajjaji
93	<b>Title: Examination of off-grid battery integration into an industrial facility in Morocco</b> Ikram EL HAJI, Kchikach Mustapha, Abdenebi EL HASNAOUI, Sahbani Sanaa
97	<b>Title: AC Impedance Calibration Research Landscape: A Bibliometric Study of Scopus Publications (2010-2024)</b> AMZIL SAID, ZAMMA ABDELLAH, EL OUARDI SOUAFIANE, SAMRI HASSAN
121	<b>Title: Molecular dynamics study of polymer electrolyte composites Based on PE08, LiClO<sub>4</sub> and Functionalized Al<sub>2</sub>O<sub>3</sub> Nanoparticles</b> MHAMED HLAL, Abdel Aziz Amine
127	<b>Title: Thermal Performance of Clay-Straw and Brick Walls in Arid vs Coastal Morocco Climates: A Numerical Approach</b> Saib Ramadhoini, Najim Monssif, M'Barek Feddaoui
152	<b>Title: Efficient Supercapacitor Charging Using a CoolMOS C6-Based Bidirectional Converter: A PSpice Simulation Approach</b> Sara Laafar, Badredine Lamuadni, Asmaa Maali
157	<b>Title: Enhanced Cooling of Electronic Components Using Nanofluid Flow in an Inverted T-Tube</b> HALIMA AIT ADDI, and M. AIT HSSAIN

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**Topic 3: Water-Energy-Food  
Nexus &  
Topic 5: Hydrogen**

Session chair : Prof. Amine Lachheb, Prof. Achraf El Kasmi, Dr. Yahya El Hammoudani

ID	Title & Authors
2	<b>Title: Estimation of Sediment Yield in the Moroccan Pre-Rif: An Approach Based on RUSLE and SDR</b> FAHED EL AMARTY ,Afaf Chakir ,Nabil fikri ,Youssef Hattafi ,lahcen benaabidate Abderrahim Lahrach
8	<b>Title: Modeling and Prediction of Landslide Risk Using Machine Learning Methods: Case of the Oued Lebene Watershed (Morocco)</b> FAHED EL AMARTY ,Afaf Chakir ,nabil Fikri,youssef hattafi, abderrahim lahrach
9	<b>Title: Optimizing Type III Hydrogen Storage Tanks : Impact of Mass Flow Rate on Refueling Efficiency</b> Ayoub Ait akka ,Mustapha El Alami ,Ayoub Gounni
23	<b>Title: Intelligent Water Quality Management through Machine Learning: A Random Forest Approach for Sustainable Systems</b> Amira ZROURI, Ilhame EL FARISSI
28	<b>Title: Kinetic Monte Carlo Simulations of Hydrogen Desorption: The Influence of Rhodium in MgH<sub>2</sub></b> Kamal Reddad ,Kamal Reddad
37	<b>Title: Enhancing Renewable Integration for Green Hydrogen</b> Driss BELKHIRI ,Khalid Cherif, Mohamed Ajaamoum
40	<b>Title: Building a Green Hydrogen value chain in Morocco: Opportunities and Challenges</b> Jihane IKHMIM
43	<b>Title: DFT Investigation of the Photocatalytic Properties of XCrH<sub>3</sub> (X = Ca, Sr and Ba): Insights into Water Splitting Potential</b> Hamza Errahoui ,Mohamed karouchi ,Abdelkebir ejjabli ,Aymane Elhaji ,Abdelmounaim laassouli ,youssef lachtioui , omar bajjou

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46	<b>Title: Optimizing Hydrogen Infrastructure in Smart Cities Using Numerical Simulation and CFD</b> idrisse abdellah ,El Mghari Hicham ,El Amraoui Rachid ,Sibadi Cherkaoui
68	<b>Title: Moroccan Dam Level Dataset: A High Resolution Satellite-Based Monitoring Dataset of Dam Levels</b> Younes Ouargani ,Noussaima El Khattabi, Mohamed Amine Fakhre-Eddine
85	<b>Title: Bibliometric Analysis of Green Hydrogen Integration into Energy Infrastructures: Trends, Collaborations, and Challenges</b> Mohammed FELLAH ,Abdellah Idrissi ,Salma Ouhaibi ,Naoual Belouaggadia
115	<b>Title: Water, Energy, Food, and Ecosystems</b> Oumaima Rbaibi and Abdelah Sahibeddine
125	<b>Title: Study of structural, electrical, mechanical, and thermal properties of perovskites XScH3 (X= Li, Na, and K) for hydrogen storage applications using DFT</b> Rachid Oualaid ,youssef El bid,Najib EL BIAZE, Rachid Markazi ,Mohamed Bouzelmad ,Abdeljabar ABOULKASSIM ,khadija El moudenib
140	<b>Title: Temperature influence on the transport and dielectric properties of the aqueous ternary system {NaF - Na<sub>2</sub>CO<sub>3</sub>}(aq) using the molecular dynamics approach</b> Ayoub lahmidi ,Sanaa Rabii, soumia chliyah ,Samir Chtita,M'hammed El Kouali ,Abdelkbir Errougui
144	<b>Title: Thermal management of fuel cells in vehicles: a review of approaches and challenges</b> Btissam MEKAOUI, and Jamila ELHAINI
203	<b>Title: Estimating carbon stocks and sequestration rates using nuclear methods</b> Nezha Mejjad, Abdelmourhit Laissaoui, Azzouz Benkdad, Fouad Taous, Moncef Benmansour
205	<b>Title: Computational Insights into the Enhanced Visible-Light Activity of Bismuth-Rich Oxybromide Photocatalysts: A VASP-Based Modeling Approach</b> Soukaina AMEUR

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<b>Topic 4: Electric Mobility &amp; Smart Grid</b>	
<i>Session chair</i> : Dr. Lahcen EL IYSAOUI @ Prof. Naoufal EL YOUSSEFI	
<b>ID</b>	<b>Title &amp; Authors</b>
22	<b>Title: Geotechnical Evaluation of Gravity-Based Foundations for Offshore Wind Turbines: A Case Study of Thornton Bank Wind Farm</b> Muhammad Usman Sikandar, Olga Khrystoslavenko
56	<b>Title: Thermal Energy Flows Management in the Construction Industry Driven by Coupling BIM, Digital Twins and AI</b> Hajar MOUMY, Tarik EL BAHOULI; Said ED-DINY
63	<b>Title: Evaluating Design and Sizing Methods for Off-Grid Hybrid Energy Systems: A Review</b> Youssef El Mrini, Jamal zerouaoui; BADIA ETTAKI
71	<b>Title: Advanced MPPT and Pitch Control for Grid-Connected WECS-PMSG: Validation and Implementation on dSPACE 1104</b> Btissam MAJOUT, Ikram SAADY, Badre BOSSOUFI, Mohammed KARIM, Houssam ECH-CHAOUY
73	<b>Title: Thermal Regulation in Extreme Environments: A 3D Model of Polar Bear Fur Insulation</b> Lamiaa Rchida, Mourad Rattal
79	<b>Title: The Efficiency of Energy Decarbonization in the Moroccan Economy</b> ABDERRAHMANE FARAS, Hassane Zouiri
80	<b>Title: Green Cities in Morocco: Towards a Sustainable Development Model Adapted to Local Specificities</b> Ioubna azizi, Nouredine Kouddane
98	<b>Title: Roads That Power the Future: Harnessing Piezoelectricity for Sustainable Energy</b> Hajar Morchid, Hicham Mastouri and Chouaib Ennawaoui
141	<b>Title: A Comparative Review of Droop Control Strategies in DC Microgrids and the Role of Artificial Intelligence in Performance Optimization</b> Yassine AIT JILLALI, Abdellah LASSIOUI; Hassan EL FADIL

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147	<b>Title: AI-Driven Optimization for Smart Grid Infrastructure: Enhancing Efficiency and Sustainability in Urban Environments</b> Shafayet Rahman
154	<b>Title: Design and optimization of a multi-input hybrid converter for non-linear thermal and mechanical energy harvesting based on double-switching DSSH technology</b> YOUSSEF EL HMAMSY, REMAIDI MOHAMMED, DERRAZ MERYIEM, EL MEHDI BOUREZZA, ABDELWAHED HAJJAJI
188	<b>Title: Optimal Coordinated Charging Strategy for Electric Vehicles to Enhance Grid Stability and User Satisfaction</b> RAJAA NAJI EL IDRISSE
196	<b>Title: Impact of COVID-19 on Electricity Consumption and Renewable Energy Integration in Morocco: An Overview of Challenges and Future Prospects</b> Saida Karmich, Mohamed El Malki, Mourad Arabi, Aziza Asserghine; Fatiha Maaroufi, El Mostafa Ziani, Jamal Bouchnaif

## FOR PARTICIPANTS: Session 2

**14:30-16:00**

**Oral (Parallel Sessions)**

<b>Topic 1: PV Technology</b>	<b>Subtopic 1.2: PV Systems Engineering</b>
	<b>Subtopic 1.4: Innovative PV Applications</b>
Session chair : Prof. Zineb Aqechmar & Prof. Abdellatif Bouaichi	
ID	Title & Authors
36	<b>Title: First-Principles Investigation of the Structural, Electronic, Optical, and Mechanical Properties of Ca<sub>2</sub>XH<sub>6</sub> (X = Mn, Cr) Double Perovskite Hydrides</b> ABDELKEBIR EJJABLI, Karouchi Mohamed, Hamza ERRAHOUI, Aymane El haji, Youssef Lachtioui, Omar Bajjou
84	<b>Title: Experimental Investigation of a Hybrid Photovoltaic-Thermal System: Energy and Exergy Analysis</b> Yassine El Alami, Charaf Hajjaj, Alae Azouzoute, Elhadi Baghaz

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101	<p><b>Title: Performance Improvement of a Standalone PV System Using a Nonlinear Integral Sliding Mode Controller</b></p> <p>Noureddine Ech-cherki, Oumaima Echab, Youssef Errami, Abdellatif Obbadi, Smail Sahnoun, Charaf Hajjaj</p>
124	<p><b>Title: Improved efficiency based on nonlinear MPPT control for grid-connected PV system</b></p> <p>Oumaima ECHAB, Noureddine Ech-cherki, Elmostafa Chetouani, Abdellatif Obbadi, Youssef Errami, Smail Sahnoun, Mohssin Aoutoul</p>
129	<p><b>Title: Implementation and Performance Comparison of an ESP32-Based MPPT Algorithm for IoT-Enabled Photovoltaic System</b></p> <p>Abdelmalek MIMOUNI, Youssef CHAHET, Aumeur EI AMRANI, Mohamed EL AMRAOUI, Mohamed AZEROUAL, Lahcen BEJJIT</p>
145	<p><b>Title: An experiment investigating the potential of utilizing a phase change material to enhance the electrical efficiency of a solar panel</b></p> <p>Mohamed BOUZELMAD, Youssef Belkassmi, Mohammed Gounzari, Rachid Oualaid, Abdellah Asbayou</p>
146	<p><b>Title: Development of a methodological approach for implementing a 3D digital twin for solar plant monitoring</b></p> <p>Zineb EL ABASSI, Imane SEBARI, Ibtihal Ait Abdelmoula, Zoubir BARRAZ</p>
162	<p><b>Title: Assessment of Thermal-Visible UAV Image Fusion Techniques for Photovoltaic Module Inspection</b></p> <p>Nouhaila BAHTIT, Fatima-Zahra BAMESSAOUD, Imane SEBARI</p>
197	<p><b>Title: 3D Numerical Analysis of the Performance of a Water- and Air-Cooled Photovoltaic-Thermal System</b></p> <p>Yassine El Alami, Charaf Hajjaj, Alae Azouzoute, Elhadi Baghaz</p>
198	<p><b>Title: 3D Numerical Study of the Effect of Partial and Total Cooling on the Performance of a Photovoltaic-Thermal System</b></p> <p>Yassine El Alami, Charaf Hajjaj, Alae Azouzoute, Elhadi Baghaz</p>

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<b>Topic 4: Electric Mobility &amp; Smart Grid</b>	
<b>Subtopic 4.2: Smart Grid Integration and Management</b>	
<b>Session chairs:</b> Prof. Kamal Anoune @ Prof. Mohamed Azeroual	
ID	Title & Authors
18	<b>Title: BESS-Integrated Smart Grids for a Smart and Sustainable Future</b> Nikhil Jayaraj, Sacithra Anandaraj, Anamika Ashok
31	<b>Title: Smart Supervision and Control for Fault Location in Microgrids with Renewable Energy and Storage Systems</b> Hafsa El meskini, Mohamed Azeroual, and Seddik Bri
35	<b>Title: Design and Implementation of Smart Meter for Optimizing and Management of Electrical Energy in Morocco</b> ALHUSSEIN BAGAYOGO, Omar Kabouri, Aboubakr EL Makrini, Mohamed Azeroual, Hassane EL Markhi
38	<b>Title: An Intelligent Energy Management Approach for DC Microgrids: Balancing Renewable Sources and Optimizing Battery Performance</b> omar kabouri, BAGAYOGO Alhussein, MOUGHRAOUI Fatima Zahra, AZEROUAL Mohamed, EL MARKHI Hassane
109	<b>Title: Enhanced Phase-Locked Loop for Grid-Connected Inverters: A Fuzzy Logic-Based Approach for Improved Synchronization</b> EL MEHDI BOUREZZA, ABDELHADI BOUKNADEL, YOUSSEF ELHMAMSY, MOHAMMED REMAIDI, CHOUAIB ENNAOUAOUI, ABDESSAMAD EL BALLOUTI
128	<b>Title: Fuzzy Logic-Based Energy Management for Hybrid Microgrids: Simulation and FPGA Implementation</b> Fatima Zahra Moughraoui, Omar KABOURI, Azeroual Mohamed, Hassane EL Markhi
160	<b>Title: Artificial Intelligence in Smart Grids: A Comprehensive Survey</b> Lahcen El iysaouy, Fatima Zahra Moughraoui and Mohamed Azeroual

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<b>189</b>	<b>Title: Modeling and control of a PEMFC based on ANN approach for smart grid applications</b> Tarik Lakhsim ,mohammed azougagh, AHMED MOUTABIR,adil barra	
<b>190</b>	<b>Title: Modelling and Vector Control of MPPT Boost and a Three-Phase Inverter for Photovoltaic Systems</b> azougagh mohammed ,Barra Adil ,LAKHSIM Tarik ,CHARADI Ssadik	
<b>PLENARY SESSION (DURATION 30MIN. INCL. Q/A DISCUSSION)</b>		
<b>Moderator: Prof. Ismael SAADOUNE &amp; Prof. Laila MANDI</b>		
 16:00-16:30   10:00-10:30		<p><b>Dr. Ilias BELHAROUAK</b>, Corporate Fellow &amp; Head of Electrification Section at Oak Ridge National Laboratory / Oak Ridge, Tennessee, United States Editor / Journal of Power Sources</p> <p style="text-align: center;"><i>Title: Is the Moroccan LFP Li-ion battery industry ready for takeoff?</i></p>
 16:30-17:00   11:30-12:00		<p><b>Dr. Saad Y. JASIM</b>, SJ Environmental Consultants (Windsor) Inc. Past President of th International Ozone Association (IOA), 2020-2022</p> <p style="text-align: center;"><i>Title: Water Reuse to Enhance Water Security and Sustainability and reduce impacts of Climate Change</i></p>
 17:00-17:30   09:00-09:30		<p><b>Prof. Sarah KURTZ</b>, University of California Merced Senior Research Fellow Emeritus at National Renewable Energy Laboratory, in Golden, CO</p> <p style="text-align: center;"><i>Title: Will the Energy Transition Drive Solar? Or, Will Solar Drive the Energy Transition?</i></p>

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	17:30-18:00	 <p><b>Prof. Sabre KAIS</b>, Goodnight Distinguished Chair in Quantum computing, the department of electrical and computer engineering, North Carolina State University</p> <p><i>Title: Quantum Energy Teleportation on a Quantum Compute</i></p>
	09:30-10:00	

**WRAP-UP AND TAKEAWAY (20 MIN.) / ALL KEYNOTE SPEAKERS PRESENT**

**FOR PARTICIPANTS: Session 3**

**18:00-19:30 Oral (Parallel Sessions)**

<b>Topic 3: Water-Energy-Food Nexus</b>	<b>Subtopic 3.2: Integrated and Sustainable Water Management</b>
	<i>Session chair:</i> Dr. Nezha Mejjad & Dr. Hicham Abou Oualid

ID	Title & Authors
32	<b>Title: Comparative Study of Public Lighting Technologies: Towards Sustainable Urban Illumination</b> Abdelmohaimine OUDAD ,Rachid El gouri
51	<b>Title: Thermal Performance of a Single-Slope Solar Distiller with Internal Reflectors for Phosphate Sludge Drying</b> Mohammed REZKI ,Khaoula KHALESS ,Nouredine ABOURICHA ,Sabah EL AMRAOUI , Nouhaila ASDIOU ,Mounia ACHAK
53	<b>Title: Comparative CFD Analysis of Thermal and Hydraulic Performance in Enhanced Plate Fin Heat Sinks</b> SIBADI Cherkaoui ,El Mghari Hicham ,El Amraoui Rachid ,Idrissi Abdellah

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<b>54</b>	<p><b>Title: Water efficiency and circular economy: Reuse of reverse osmosis by-products in the steel industry</b></p> <p>Ayoub CHERRAT ,El Mostafa ERRADI ,yassine ENNACIRI, Boujemaa DRIF,Chouaib ENNAWAOU ,Ayoub BAYOUSSEF, Hicham EL OSSMANI ,Charaf HAJJAJ ,Hamid NASRELLAH ,Najoua LABJAR ,Hanan EL ALAOUI-BELGHITI ,Mohammed BETTACH ,Souad EL HAJJAJI</p>
<b>64</b>	<p><b>Title: CFD Analysis of Water Vapor Condensation for Enhanced Sustainable Water Harvesting</b></p> <p>NAIMA OUMOUS,ABDELMOUNAIM DADDA, MOHAMED ASBIK ,HANANE MESSAOUDI</p>
<b>76</b>	<p><b>Title: Validation of CFD Models for Two-Phase Flow and Heat Transfer in Complex Systems</b></p> <p>SIBADI Cherkaoui ,El Mghari Hicham,El Amraoui Rachid,Idrissi Abdellah</p>
<b>113</b>	<p><b>Title: Sustainable Water Purification with Carboxymethylcellulose-Based Hydrogel Beads for Efficient Contaminant Removal</b></p> <p>Rania ABIDI ,lamiae BOURASSI ,meriem elmrani ,Mohammed merzouki ,Abdesselam TAHANI ,Boufelja BOUAMMALI ,Allal CHALLIOUI</p>
<b>119</b>	<p><b>Title: Comparative study of macro-, meso- and microplastics debris in two sandy beaches of the Moroccan mid-north coast</b></p> <p>Bouchra EL HAYANY,Khaoula EN-NEJMY ,Assala LOUKILI , Loubna EL FELS ,Mohamed HAFIDI</p>
<b>163</b>	<p><b>Title: Migration dynamics of PE and PVC microplastics in soil An experimental column-based investigation</b></p> <p>Khaoula EN-NEJMY ,bouchra EL HAYANY , Loubna Elfels , Mohamed Hafidi</p>
<p><b>Topic 5: Hydrogen</b></p> <p><b>Subtopic 5.4: Hydrogen Infrastructure Development</b></p> <p><b>Subtopic 5.5: Scenarios for Hydrogen Sector Development, Policy, Global Challenges</b></p> <p><b>Session chair: Prof. Samir Touili &amp; Prof. Alae Azouzoute</b></p>	

ID	Title & Authors
42	<b>Title: Economic Assessment of Water and Ecosystem Services: A New Approach for Sustainable Water Management in the Green Hydrogen sector</b> <b>Souad Elibrahimi Abir Dahani;</b> Chouaib Benqlilou
82	<b>Title: Techno-economic study and comparison between electrical and green hydrogen vehicle charging stations</b> <b>Ikram EL HAJI,</b> Btissam MEKAOUI, Kchikach Mustapha, Jamila EL HAINI, Abdennebi EL HASNAOUI, Sabraoui CHAYMAE
96	<b>Title: Green Hydrogen: Advancing Energy Applications in Germany</b> <b>Mohammed Saghir</b>
133	<b>Title: The Future of Power-to-Hydrogen: Technological Innovations and Smart Grid Deployment</b> <b>hiba mounir;</b> Abdessamad Malaoui; Naima Taifi
149	<b>Title: Comparative analysis and techno-economic assessment of hydrogen production from electrolysis and biomass</b> <b>Majdouline BAGY;</b> Mostafa CHOUITAR, Alae AZOUZOUTE; Charaf HAJJAJ; Ali BOUKHRISS
167	<b>Title: Optimizing Green Hydrogen Production From Water Electrolysis</b> <b>Meryem OUMELLA,</b> BOUHRIM Hafssa and EL MARJANI Abdellatif
172	<b>Title: Hydrogen production from biogas via steam reforming: A sustainable pathway for waste-to-energy conversion</b> <b>Mostafa Chouitar;</b> Majdouline Bagy; Alae Azouzoute; Charaf Hajjaj; Dris Bahia; Salah Daoudi
184	<b>Title: Optimization of Renewable Processes for Green Fuel Production and Industrial Decarbonization in Morocco</b> <b>MAJD BARHDADI,</b> EL BOUDI Moustapha, EL HACHEMI Nizar and ABBOUAhmed
185	<b>Title: Intelligent management of a solar-hydrogen micro-grid: Simulation and energy optimization</b> <b>Hanane Karmouss,</b> Omar Ansari

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<b>Topic 6: Batteries &amp; Energy Storage Systems</b>	<b>Subtopic 6.2: Energy Storage Solutions for Renewable Integration</b> <b>Subtopic 6.5: Future Trends in Energy Storage</b>
	<b>Session chair: Prof. Ayoub Gounni &amp; Prof. Hamza Faraji</b>
ID	Title & Authors
24	<b>Title: Renewable Energy Potential of Rosemary Stem Biochar</b> Abdelouassia Dira; Abdelhakim Elmouwahidi; Francisco Carrasco-Marin; Elkhadir Gharibi
117	<b>Title: Impact study of the discontinuity of linear thermal bridges on the thermal performance of the envelope and the heating and cooling needs of a model building, taking into account the usual construction method and the Moroccan climatic context</b> KARMA MOUHCINE, El gounni Ayoub
148	<b>Title: Mixed Convection Heat Transfer Enhancement Using NEPCM-Based Nanofluids under Magnetic Field in a Lid-Driven Cavity</b> Abderrahim Bahoum; Mohamed EL HATTAB; Youness EL HAMMAMI
156	<b>Title: Effect of Hybrid Nanoparticles and Metal Foam on the Cooling Performance of PCM-Based Heat Sinks for Electronic Component Thermal Management</b> Ibtissam Afaynou ; Hamza Faraji; Khadija Choukairy
161	<b>Title: Thermal Modeling of Si-IGBT Power Modules for Renewable Energy Systems Using a Multilayer RC Network Approach</b> Badredine Lamuadni; Sara Laafar; Rachid El bouayadi; Driss Zejli
165	<b>Title: Solvation shell structures, dynamics, and dielectric properties of the Sodium-Ion Battery System {NaBF<sub>4</sub> – Gamma ButyroLactone}: A molecular dynamics approach</b> Sanaa rabii, Ayoub Lahmidi, Soumia Chliyah, Samir Chtita, Mhammed El KoulaOUALI, and Abdelkbir ERROUGUI
171	<b>Title: Temperature-Dependent Permeability of Cob: Impact on Hygrothermal Storage and Energy Efficiency in Buildings</b> Yousra TAOUIRTE; Louahlia Hasna; Gounni Ayoub; El Alami Mustapha

174	<p><b>Title: Numerical Study on the Efficiency Improvement of Latent Heat Storage Systems with Innovative Hexagonal Fins</b>  <b>MANAL HARISS</b>; Ayoub Gounni; Mustapha El Alami</p>
180	<p><b>Title: Improvement of Tc, Unit Cell Volume, and Meissner Effect in High-Temperature Superconductors</b>  <b>Abdeljabar Aboulkassim</b>; Said Kririm; El Hanafi Arjdal; Rachid Oualaid; Youssef El bid</p>
<p><b><u>Topic 3: Water-Energy-Food Nexus</u></b></p>	
<p><b><u>Subtopic 3.1: Sustainable Farming Systems</u></b>  <b><u>Subtopic 3.3: Agri-Food Value Chain</u></b>  <b><u>Subtopic 3.4: Water, Energy, Food, and Ecosystems</u></b></p>	
<p><b><u>Session chair</u> : Prof. Farid Mansouri &amp; Dr. Massaab El Ydrissi</b></p>	
<b>ID</b>	<b>Title &amp; Authors</b>
12	<p><b>Title: The Green HACCP Approach: Advancing Food Safety and Sustainability</b>  <b>Mohamed ZARID</b></p>
55	<p><b>Title: Agrivoltaic Systems: A Case Study of Spinach in South Africa</b>  <b>Liz Mubari</b></p>
103	<p><b>Title: Determination of the Rare Earth Elements in Sudanese Gold mining areas using Neutron Activation</b>  <b>Minas E. Ahmed</b> ,Hamid Bounouira, Mohamed A. Abbo ,Hamid Amsil ,Illyase Aarab ,Abdelwahab Badague</p>
107	<p><b>Title: Evaluation of the Soil-to-Plant Transfer Coefficients of Naturally Occurring and Anthropogenic Radionuclides in Agricultural Crops in Morocco</b>  <b>Zineb ELABOUDI</b> ,Samira ELAOUIDI ,Radouan SAADI ,Azzouz BENKIDAD ,EL MOURIDI, Abdelmoughit LAISSAOUI ,Abdelaziz MADENZI ,Salah SOUABI</p>

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<b>111</b>	<p><b>Title: Improvement of the properties of composite films based on hydroxyethyl cellulose and 25% epoxidized natural rubber.</b></p> <p><b>LAMIAE BOURASSI</b>, Ayoub ABARKAN ,Mohammed. MERZOUKI ,Rania ABIDI, Meriem EL MRANI ,Bilel MILED ,Abderrahmane El IDRISSEI ,Boufelja BOUAMMALI ,Allal CHALLIOUI</p>
<b>138</b>	<p><b>Title: Morocco's Food Security at a Crossroads: Climate, Imports, water, and Agricultural Resilience</b></p> <p><b>Redouane Kaiss</b>, Zakaria Benjouid ,Said Saghir Zarouali ,Nouha Belmahi ,Yassine Mouniane</p>
<b>177</b>	<p><b>Title: Development of ecological indicators for lifecycle maintenance ecosystem service in the context of offshore wind farm development</b></p> <p><b>Hind AGUELAL</b>, Yoann Baulaz, Pierre bourdaud, Emma Araignous, Nathalie Niquil, Elkalay Khalid</p>
<b>179</b>	<p><b>Title: Monitoring the Water-Energy-Food Nexus with Remote Sensing: A Spatial and Temporal Analysis of Morocco</b></p> <p><b>Abir Habib</b> , Youssef Houali , Yassine Labbassi , Yassine Labbassi, Kamal Labbassi</p>

END OF THE FIRST DAY

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## DAY 2 / 25, APRIL 2025

### PLENARY SESSION (DURATION 30MIN. INCL. Q/A DISCUSSION)




Moderator: Prof. Omar ELOUTASSI & Prof. Mustapha EL ALAMI

 09:00-09:30  10:00-10:30		<p><b>Prof. Ivan GORDON</b>, Department Director IMOMEC at imec/Energyville - Vice-Director IMO at Hasselt University Professor Digital Photovoltaics at TU Delft.</p> <p><i><u>Title:</u> Crystalline-Silicon solar cells: State-of-the-art and future challenges</i></p>
 09:30-10:00  11:30-12:00		<p><b>Prof. Raşit TURAN</b>, Center for Solar Energy Research and Applications (ODTÜ-GÜNAM); Department of Physics, Middle East Technical University, 06800, Ankara-Turkiye</p> <p><i><u>Title:</u> TOPCon Crystalline Si Solar Cell Technologies and Beyond</i></p>
 10:00-10:30		<p><b>Prof. Saleh KHAMLIICH</b>, Research Centre of Excellence, UM6P - Mohammed VI Polytechnic University</p> <p><i><u>Title:</u> Nanofluids and Their Advances Towards Renewable Energy Applications</i></p>

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	10:30-11:00		<b>Dr. Mounia KARIM</b> , Senior Researcher in Solar Energy and Zero Carbon, University of Derby, Angleterre, Royaume-Uni.  <i>Title: Local community acceptability of Solar power plants: Challenges and Opportunities?</i>
	10:30-11:00		

## FOR PARTICIPANTS: Session 1

11:00-12:30

ORAL

**Topic 4: Electric Mobility & Smart Grid**

**Subtopic 4.1: Electric Vehicle (EV) Infrastructure Development & Subtopic 4.4: Data Analytics and Smart Mobility Services**

Session chair: Prof. Loubna Bouselham & Dr. Kawtar Benabdelaziz

ID	Title & Authors
6	<b>Title: ICoSES 2025 Instructions for Extended Abstracts (Predictive Maintenance and Intelligent Mobility: Estimating the Residual Lifespan of Rolling Components)</b> SABAH LOURAGLI
41	<b>Title: Integration of Wind Energy to Optimize Electric Vehicle Charging: Wind Turbine Modeling</b> Mina Benraouane, Lahcen BALLI, Isamel DRIOUCH
65	<b>Title: Optimal sizing of autonomous BIPV/PV/ battery for an mid-rise urban building in the city of Azrou - Morocco</b> SARAH FORROUSSO, Samir Idrissi kaitouni, Jamal Brigui, Kamal Reklouli

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70	<p><b>Title: Water Sustainability in the Construction Industry and Sites: How an Environmental Management System Makes a Difference: A survey</b>  soukaina bakkass, Mohammed Karim BENHACHMI, Naoual SEMLALI AOURAGH HASSANI</p>
86	<p><b>Title: Smart Cities and the Future of Urban Development: A Case Study of Rabat, Morocco</b>  idrissi abdellah, Fellah Mohammed, El Mghari Hicham, El Amraoui Rachid, Belouaggadia Naoual</p>
122	<p><b>Title: Data Analytics and AI-Driven Smart Mobility Services : A Review of Emerging Technologies and Applications</b>  Sanae okacha ,Houssam Bouardi</p>
123	<p><b>Title: Innovative Surface Contact Optimization for Enhanced Triboelectric Energy Harvesting: Analytical and FEA-Based Investigation</b>  mohammed Remaidi ,Meryiem DERRAZ, Youssef EL HMAMSY ,Hicham MASTOURI, Chouaib ENNAWAOU, Abdelowahed HAJJAJI</p>
130	<p><b>Title: Optimizing Portable Battery Hub Locations for E-Bikes to Reduce Grid Load: A GIS-MCDM Approach</b>  Ezgi Tükel ,Gürkan Öztürk ,Saye Nihan Çabuk</p>
132	<p><b>Title: Optimizing Transformer Load Management Using K-Means Clustering</b>  Ezgi Tükel ,Ahmet Karabuğa</p>
<b>11:00-12:30 Poster</b>	
<b>Topic 1: PV Technology</b>	<p><b>Subtopic 1.3: PV Module Durability and Reliability</b>  <b>Subtopic 1.4: Innovative PV Applications</b></p>
	<p>Session chair : Prof. Alae Azouzoute &amp; Prof. Charaf Hajjaj</p>
<b>ID</b>	<b>Title &amp; Authors</b>
44	<p><b>Title: Towards Optimized and Efficient Photovoltaic Systems: Intelligent and Innovative Approaches for Energy Management</b>  Meryem Yahyaoui, Mohamed Karom, Hajar Chadli, Mohammed Saber, Sara Chadli</p>

67	<b>Title: Simulation and Performance Evaluation of a Photovoltaic Water Pumping System for Remote Rural Areas</b> Fatima Id Ouissaaden
75	<b>Title: Practical comparison of cylindrical and flat PV modules</b> Khalid Cherifi, Driss BELKHIRI, Mohammed AJAAMOUM
78	<b>Title: Advancing Photovoltaic Output Prediction Under Dust Using the Ångström Turbidity Equation</b> Abdellah ASBAYOU, Hamid Hamdaouy, Mohemmed Bouzelmad, Ismail Isknan, Ahmed Soussi, Ahmed Ihlal, Lahoussine Bouhouch
91	<b>Innovative Floating Photovoltaic Systems for sustainable energy conversion: An updated review</b> Salma Sebbaghi, Najiba El Amrani, Zineb Aqachmar, Aziz Derouic
108	<b>Title: Optimizing the cooling of photovoltaic panels with a bio based phase change material: Design, Multiphysics modeling and numerical simulation</b> hafsa kandry, Mohammed Remaidi, Amine Ennawaoui, Hicham Mastouri, Mohammed El Jouad, Chouaib Ennawaoui
120	<b>Title: A Systematic Review of Solar Panel Cleaning Techniques: Performance, Cost, and Optimization Perspectives</b> Abdelali Abdessadak, Hicham GHENNIQUI, Nadège THIRION-MOREAU, Safae MERZOUK and Mounir ABRAIM
159	<b>Title: Energy, Environmental and Economic Assessment of Photovoltaic Potential: A Case Study in Guinea</b> Cheikh Saliou TOURE, Mamadou TRAORE, Papa Lat Tabara SOW, Ousmane BARRY, Senghane MBODJI
178	<b>Title: Comparative Study of the Performance of a Photovoltaic-Thermal System and a Photovoltaic-Thermal System With Phase Change Material: A CFD Simulation Study</b> Fatima Ouerradi, Yassine El Alami, Rachid Bendaoud, Elhadi Baghaz
200	<b>Title: Performance Comparison of Floating and Land-Based PV Systems: Effects of Water Cooling and Tilt Angle under Moroccan Conditions</b> El Mehdi BOUHNANE, Bouchra LAARABI, Salma ZAIM and Abdelfettah BARHDADI
201	<b>Title: Thermal and Electrical Performance Evaluation of a Water-Based PVT Hybrid Solar Collector: Simulation and Experimental Analysis</b> Fatima Zahra KADDAR, Bouchra LAARABI, Hajar HAFS and Abdelfettah BARHDADI

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202	<b>Title: Quantifying Soiling Effects on Solar Panel Output Using the Stochastic Rate and Recovery (SRR) Method</b> Bilal CHEBLI, Bouchra LAARABI, Salma ZAIM and Abdelfettah BARHDADI	
<b>PLENARY SESSION (DURATION 30MIN. INCL. Q/A DISCUSSION)</b>		
<b>Moderator: Prof. Ahmed ENNAOUI &amp; Prof. Saad JASIM</b>		
 14:00-14:30   15:00-15:30		<p><b>Prof. Thomas HANNAPPEL</b>, Head of the department “Fundamentals of Energy Materials” Dean of the Master course “Renewable Energy Techniques” at the Institute of Physics, Technische Universität (TU) Ilmenau</p> <p><i>Title: Critical points of III-V semiconductor device structures for sustainable photoelectrochemical solar fuels production</i></p>
 14:30-15:00		<p><b>Prof. Laila MANDI</b>, International Institute for Sustainable Transition in Africa, Marrakech, Morocco Faculty of Sciences Semlalia, Cadi Ayyad University, Marrakech, Morocco.</p> <p><i>Title: Water Resources and Sustainability: Towards a Greener Future</i></p>
 15:00-15:30		<p><b>Prof. Youssef BELMABKHOUT</b>, Mohammed VI polytechnic University (UM6P), Applied Chemistry and Engineering research (ACER) Centre of Excellence (CoE)</p> <p><i>Title: Advanced concepts for adsorptive based gas/vapor separations/purification with different degree of complexity. Air Capture as a case study</i></p>

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WRAP-UP AND TAKEAWAY (20 MIN.) / ALL KEYNOTE SPEAKERS PRESENT

**FOR PARTICIPANTS: Session 2**

**15:30-17:00**

**ORAL (Parallel Sessions)**

**Topic 2: CSP Technology**

- Subtopic 2.1: Measurement and Analysis Systems**
- Subtopic 2.2: CSP Integration and Market Dynamics**
- Subtopic 2.3: Thermal Energy Processes and Applications**
- Subtopic 2.4: Thermal Energy Storage and Management**
- Subtopic 2.5: Operational Efficiency and Reliability**

Session chairs: Prof. Meriem Chaanaoui & Prof. Mohammed Benhaddou

ID	Title & Authors
47	<p><b>Title: Development and Analysis of a Hybrid Passive Cooling System Coupling Superficial Geothermal Energy and Phase Change Materials.</b>  <b>Azziz CHETOUNI, Samir Idrissi Kaitouni, Eric Schall, Tarik Kousksou, Abdelmajid Jamil</b></p>
48	<p><b>Title: Numerical Evaluation of Heat Transfer Fluid Effects on Packed-Bed Thermal Energy Storage Efficiency</b>  <b>Aicha EDDEMANI, Omar Achahour, Hayat El Baamrani, Ahmed Aharoune, Lahcen Bouirden, Ahmed Ihlal</b></p>
72	<p><b>Title: Water energy nexus of parabolic trough solar powerplants</b>  <b>Zineb Aqachmar, Rachid BENDAOU, Nabil FARKAD, Omar FARKAD, Rabi TAKASSA</b></p>
87	<p><b>Title: PROTEAS: a platform for advancing and demonstrating renewable energy and seawater desalination technologies</b>  <b>M. Georgiou, K. Milidonis, N. Fylaktos, A. Montenon, W. Lipiński, E.G. Stiliaris and C.N. Papanicolas</b></p>

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92	<p><b>Title: Development of a technique for measuring the optical errors of solar mirrors based on the Deflectometry approach</b></p> <p>Massaab EL YDRISSI, alae azouzoute, Moulay Taj Amine, Ghennioui Hicham, Mohamed Boujoudar, Ibtissam Bouarfam, Mounir Abraim</p>
112	<p><b>Title: Modeling and CFD Analysis of an Indirect Solar Dryer: Insights into Thermal Behavior and Banana Drying Kinetics</b></p> <p>Jaouad Ennissioui, El Mahjoub Benghoulam, Tarik El. Rhafiki</p>
114	<p><b>Title: Comparing the techno-economic performance of low-temperature heat pump and high-temperature gas boiler in a residential building</b></p> <p>Eram Khan, Eram Khan and Meysam Qadrnan</p>
158	<p><b>Title: CFD simulation of solar still enhanced with blade.</b></p> <p>Reda Aftiss</p>
170	<p><b>Title: Impact of Covering Materials (Glass vs Plastic) on the Performance of Solar Thermal Collectors</b></p> <p>Mbarek Chahboun, Mohcine Abouyaakoub, Ali Ait Ali , Hicham Hihi</p>
<p><b><u>Topic 1: PV Technology</u></b></p>	
<p><b><u>Subtopic 1.1: Photovoltaic Materials and New Concepts</u></b></p>	
<p><u>Session chairs:</u> Prof. Mustapha Rouchdi, Prof. Fayçal Goumrhar and Prof. Zouhair El Jouad</p>	
<b>ID</b>	<b>Title &amp; Authors</b>
13	<p><b>Title: Efficient and Stable Sn-Doped FAPbI<sub>3</sub> Perovskite Solar Cells Achieving 51.14% Efficiency Using P3HT as a Hole Transport Layer</b></p> <p>Mohamed Karouchi, Abdelkebir EJJABLI, El Haji aymane, Hamza ERRAHOU, Youssef LACHTIOUI</p>
19	<p><b>Title: Impact of stibnite crystallinity and surface wettability on photocatalytic activity analysed through photocatalytic dye degradation</b></p> <p>Heera S, Deepa K G</p>
81	<p><b>Title: Performance Analysis of WSe<sub>2</sub>-based Thin-film Solar Cell with Non-toxic ZnSe Buffer Layer Using SCAPS-1D Simulation Approach</b></p> <p>Md. Morsalin, Md. Ferdous Wahid, Md. Sazedur Rahman</p>



90	<p><b>Title: Performance Analysis of Lead-Free Cs<sub>2</sub>PtI<sub>6</sub>-Based Double Perovskite Solar Cell With and Without Hole Transport Layer Using SCAPS-1D Simulation Software</b></p> <p>Md. Sojibur Rahman, Md. Sazedur Rahman, Md. Morsalin</p>
99	<p><b>Title: Fabrication and Characterization of CsPbI<sub>3</sub> Perovskite Thin Films via Physical Vapor Deposition</b></p> <p>Amina Laouid, Mientki Mateusz, Amine Alaoui Belghiti, Krzysztof Wisniewski, Przemysław Płóciennik, Abdelwahed Hajjaji, Anna Zawadzka</p>
104	<p><b>Title: Band gap Engineering in Stable Double Perovskites via Substitution</b></p> <p>Abdelkhalek EL RHARIB</p>
139	<p><b>Title: First-principal study of the structural, electronic and optical properties of the perovskite ASrCl<sub>3</sub> (A = Cu and Ag)</b></p> <p>YOUSSEF EL BID, Y. EL BID, R. OUALAID, Y. EL ARFAOUI, A. SOUSSI, M. CHAHBOUN, Mohamed EDDEKKAR N. EL BIAZE, and R. MARKAZI</p>
183	<p><b>Title: Structural and Optical Characterization of Ca<sub>3</sub>Ti<sub>2</sub>-xZrxO<sub>7</sub> Ruddlesden-Popper Perovskite: Insights for Advanced Optoelectronic and Solar Cell Applications</b></p> <p>Bouchra Riyani, B. Riyani, H. Lemziouka, A. Boutahar</p>
195	<p><b>Title: Optimization of CZTS Solar Cells via Ag-Ge Co-Doping</b></p> <p>yavuz atasoy, Mehmet Ali Olğar, Ali Çiriş, Recep Zan</p>
<p><b>Topic 5: Hydrogen</b></p> <p><b>Subtopic 5.1: Hydrogen Production</b></p> <p><b>Subtopic 5.2: Hydrogen Storage and Distribution</b></p> <p><b>Subtopic 5.3: Hydrogen Uses and Applications</b></p> <p>Session chairs: Prof. Rachid Amrousse &amp; Prof. Amine Alaoui Belghiti</p>	
<b>ID</b>	<b>Title &amp; Authors</b>
1	<p><b>Title: An Efficient Hydrogen Production System Powered by Hybrid Renewable Energy Using Sliding Mode Control</b></p>

	<b>Abdellah EL IDRISSEI</b> , Belkasem IMODANE, Hamid HAMDANI, Kaoutar Dahmane, M'hand OUBELLA and Mohamed AJAAMOUM		
5	<b>Title: <math>\alpha</math>-Ag<sub>2</sub>WO<sub>4</sub>/g-C<sub>3</sub>N<sub>4</sub> for photocatalytic hydrogen production under simulated sunlight</b> Habiba KHIAR, Alberto Puga, and Nouredine Barka		
21	<b>Title: Hydrogen as a Marine Fuel: An Assessment of Decarbonization Pathways for Klaipėda's Port</b> Muhammad Usman Sikandar; olga khrystoslavenko		
25	<b>Title: Enhanced efficiency and durability of nickel sulfide catalyst integrated with graphene oxide: exploring hierarchically porous structures for methanol oxidation reaction</b> EL MEHDI SALMI		
52	<b>Title: Green hydrogen production potential from Moroccan biomass: Development and simulation of an enhanced gasification model using Aspen Plus</b> Abir Dahani ; Zakaria Chalhe ; Chouaib Benqlilou; Markus Holz; Cornelia Scott		
110	<b>Title: High-resolution wind power forecasting using Von Kármán turbulence model enhancement and neural networks</b> Bienvenu NDEBA; Abdellatif GHENNIQUI, Fatima-Zahra OUCHANI		
153	<b>Title: Structural, optical, elastic, electronic and gravimetric properties of the hydrogen storage capacity of perovskite hydrides: DFT study</b> khadija El-moudenib; Abderrahim boutahar		
164	<b>Title: Synthesis and Characterization of Mn-Promoted Ni/MgO-Al<sub>2</sub>O<sub>3</sub> Catalysts for CO<sub>2</sub> Methanation</b> Asmae Ez-zahar; Satu Ojala; Mika Huuhtanen; Rachid Brahmi		
186	<b>Title: Towards a low-cost Solid Oxide Electrolyte based on local mineral</b> Oumaima ETTALIBI, Abdessamad Samid, Oufae Achak, Mohammed Mansori and Tarik Chafik		
<table border="0" style="width: 100%;"> <tr> <td style="width: 30%; vertical-align: top;"> <p><b>Topic 6: Batteries &amp; Energy Storage Systems</b></p> </td> <td style="vertical-align: top;"> <p><b>Subtopic 6.1: Advanced Battery Technologies</b></p> <p><b>Subtopic 6.3: Battery Management Systems (BMS)</b></p> <p><b>Subtopic 6.4: Recycling and Sustainability of Battery Materials</b></p> </td> </tr> </table>		<p><b>Topic 6: Batteries &amp; Energy Storage Systems</b></p>	<p><b>Subtopic 6.1: Advanced Battery Technologies</b></p> <p><b>Subtopic 6.3: Battery Management Systems (BMS)</b></p> <p><b>Subtopic 6.4: Recycling and Sustainability of Battery Materials</b></p>
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Session chairs: Prof. Mohamed Aqil @ Prof. Nabih Saadi	
ID	Title & Authors
4	<p><b>Title: Improving Battery State of Charge Estimation Using Autformer and MAML: A Model-Agnostic Meta-Learning Method</b>  <b>HAFSA KHAYRANE</b></p>
15	<p><b>Title: Understanding the Role of Manganese Doping in High Voltage LiNi<sub>0.78</sub>Co<sub>0.17-x</sub>Mn<sub>x</sub>Al<sub>0.05</sub>O<sub>2</sub> Electrodes: Experimental and Theoretical Study</b>  <b>Fadila EL KOUIHEN; Abdessamad FAIK</b></p>
16	<p><b>Title: A sustainable approach to develop Moroccan phosphate resources for Lithium-ion batteries</b>  <b>SAID AZERBLOU; Redouane OUBAH; Hamza Ouachtouk; Elmostafa Tace</b></p>
33	<p><b>Title: AI-driven Management of Sustainable Energy Sources and Hydrogen-Battery Storage System for Energy Transition</b>  <b>Ismail ELABBASSI; Naima El yanboiy; Mohamed Khala; Omar Eloutassi; Youssef El hassouani</b></p>
94	<p><b>Title: Lithium and Sodium Hydrogen Phosphate-Based Materials: Synthesis, Characterization, and Investigation of Optical, Electrical, and Dielectric Properties</b>  <b>KHADIJA CHOUNI, Abdelmonim Assekouri, Wafaa Elhatimi, Wafaa Elkasiti, Redouane Lahkale, Elmouloudi Sabbar</b></p>
150	<p><b>Title: First-Principles Investigation of Transition Metal-Doped Phosphorene as High-Performance Anode Materials for Lithium-Ion Batteries</b>  <b>Mouna EL ABBOUBI; Mehmet ERDEM; Sait San; Idris Candan</b></p>
151	<p><b>Title: Adaptive EKF Parameter Tuning for Battery EVs via Simulink Parameter Estimation</b>  <b>hamza benhammou; kamal anoune; Abdelali TAJMOUATI</b></p>
168	<p><b>Title: Concentration effects on the solvation, transport, and dielectric properties of the energy storage system {NaBF<sub>4</sub> - Dimethyl sulfoxide} used in sodium-ion battery technology: A molecular dynamics approach</b>  <b>SOUMIA CHLIYAH; Ayoub Lahmidi; Sanaa Rabii; Abdelkbir Errougui; Samir Chtita</b></p>

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199	<p><b>Title: Unlocking the Full Potential of Piezoelectric Energy: Synergizing P-SSHI and LTC3588-1 for Enhanced Harvesting Efficiency</b></p> <p>Loubna bensaïd, Loubna Bensaïd, El Hmamsy Youssef, Hajjaji Abdelowahed</p>
<p><b>15:30-17:00</b> <b>Poster</b></p>	
<b>Topic 1: PV Technology</b>	<p><b>Subtopic 1.2: PV Systems Engineering</b></p> <p><u>Session chair:</u> Session chairs: Prof. Ayoub Nouaiti @ Dr. Emre DEMIREZEN</p>
39	<p><b>Title: Comparison of MPPT Performance for Two Photovoltaic Models</b></p> <p>MOHCINE ABOUYAAKOUB, Mbarek Chahboun, Ali Ait Ali, Hicham Hihi, Souhail BARAKAT</p>
66	<p><b>Title: A Comparative Study of Deep Learning Models for Global Horizontal Irradiance Prediction</b></p> <p>oussama khouili</p>
100	<p><b>Title: Enhancing PV system efficiency using MPPT controller based on Flower Pollination Optimization algorithm</b></p> <p>Meriem Boudouane, Lahoussine Elmahni</p>
131	<p><b>Title: Fuzzy Logic-Based Energy Management for a Grid-Connected PV Water Pumping System: Optimization and Performance Analysis</b></p> <p>MHAMED FANNAKH, Mohamed Larbi ELHAFYANI, Tarik RAFFAK</p>
136	<p><b>Title: An MPPT Approach Based on Dichotomous Search for Improved Photovoltaic System Performance</b></p> <p>Fatima Zahra MOUSTAINE, Lahoussine Elmahni, Hamid Belghiti, Yassine EL Aidi Idrissi, Achraf Hani</p>
142	<p><b>Title: Potential of Immersive Technologies for Monitoring Solar Installations</b></p> <p>ahmar khaoula, Ahmar Khaoula, AMAAJANE HAJAR and SEBARI IMANE</p>
169	<p><b>Title: Advanced Solar Radiation Modeling for Enhanced PV System Performance for a Moroccan city</b></p> <p>HALIMA YAKOUBI, El Mghouchi Youness and KHELLOUKI Abdeljabar</p>
176	<p><b>Title: Descriptor-Based Fuzzy <math>\infty</math> MPPT Control for Solar Energy Systems</b></p> <p>Abdeljabar Aboulkassim, Said Kririm, Naoual Armi, Bensalam Boukili, El Hanafi Arjdal</p>

<b>181</b>	<p><b>Title: Enhancing the Performance of PVT Systems through Flow Rate and Channel Configuration Optimization</b></p> <p>Ayoub Riad, Houssam Amiry, Said Yadir, Abdelilah Sadik, Fouad Belhora, Abdelwahed Hajjaji, Samira Touhtouh</p>
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**PLENARY SESSION (DURATION 30MIN. INCL. Q/A DISCUSSION)**

 17:00-17:30		<p><b>Dr. Greg P. SMESTAD</b>, PI at Sol Ideas Technology Development, California / Editor Emeritus for Solar Energy Materials and Solar Cells</p> <p><i>Title: Solar Energy-Related Engineering and Entrepreneurship in Emerging Market Countries</i></p> <p><i>Moderator: Prof. Aumeur El Amrani &amp; Prof. Charaf HAJJAJ</i></p>
 09:00-09:30		

**FOR PARTICIPANTS: Session 3**

**17:30-19:00**

**ORAL**

<b>Topic 1: PV Technology</b>	<p><b>Subtopic 1.3: PV Module Durability and Reliability</b></p> <p><b>Subtopic 1.5: PV in the Energy Transition</b></p> <p><i>Session chair: Prof. Zineb Bounoua and Dr. Bouchra Laarabi</i></p>
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ID	Title & Authors
29	<p><b>Title: Enhanced Fault Detection in Photovoltaic Systems Using SVM-GA and SVM-RS: A Comparative Study for Optimized Energy Production</b></p> <p>Naima El yanboiy, Mohamed Khala, Ismail Elabbassi, Nourddine Elhajrat, Youssef El hassouani</p>

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30	<p><b>Title: Enhancing PV Performance: Real-Time Cloud Detection Using YOLOv5 for Improved Solar Energy Forecasting</b>  <b>Khala Mohamed, Naima El yanboiy, Ismail Elabbassi, Omar Eloutassi, Mohammed Halimi, Choukri Messaoudi</b></p>
83	<p><b>Title: Dust particle composition on PV modules in desert and coastal regions: A comparative study in Morocco.</b>  <b>Alae Azouzoute, Abdellatif Bouaichi, Mounir Abraim, Oumaima Mertah, Massaab El Ydrissi, Ayoub Oufadel, Charaf Hajjaj</b></p>
116	<p><b>Title: Faults Detection and Prediction in PV Systems A Review of Classical Methods and AI-Based Approaches for Enhanced Reliability</b>  <b>Abdelhamid ADALIOU, Mostafa EL OUARIACHI, Kamal HIRECH</b></p>
118	<p><b>Title: Soiling of Solar Installations: Effect of Meteorological Factors and Particulate Matter on Light Transmission</b>  <b>Salma Zaim, Saad Gheouany, Bouchra Laarabi, Abdelfattah Barhdadi, Mouhaydine Tlemcani, Asmae Arbaoui</b></p>
134	<p><b>Title: Urban Expansion, Energy Consumption, and the Role of Photovoltaics in Sustainable Development: A Comparative Study of Morocco and Spain</b>  <b>diani oumaima, Diani Oumaima, Hicham Mastouri and Chouaib Ennawaoui</b></p>
143	<p><b>Title: Evaluating the Impact of Energy policy on tertiary Photovoltaic Systems in real case study in Morocco</b>  <b>Mouhssine Rami, Charaf Hajjaj, Samira Touhtouh, Alae Azouzoute, Elhadi Baghaz, Abdelowahed Hajjaji</b></p>
166	<p><b>Title: Long-term performance, degradation, and cost analysis of different photovoltaic module technologies in the arid climate of Morocco</b>  <b>Mohammed ELMESELLEK, Abdellatif Bouaichi, Alae Azouzoute</b></p>
187	<p><b>Title: Impact of Dust Deposition on the Performance of Photovoltaic Modules: A Year-Long Study</b>  <b>Abdellatif Bouaichi, Aumeur El Amrani, Alae Azouzoute, Choukri MESSAOUDI</b></p>

END OF THE SECOND DAY

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## DAY 3 / 26, April 2025



### PLENARY SESSION (DURATION 45MIN. INCL. Q/A DISCUSSION)

#### Keynote of, Prof. Leonardo MICHELI

 <p>09:00-09:35</p>		<p><b>Prof. Leonardo MICHELI</b>, Associate Professor, Dept. of Astronautical, Electrical and Energy Engineering (DIAEE) Sapienza University of Rome, Italy</p> <p><i>Title: Large-scale impacts of dust storms on the national photovoltaic capacity</i></p>
 <p>10:00-10:35</p>		

## WORKSHOP ON MODELING SOILING: STATUS, RESOURCES, AND CHALLENGES










#### Moderators: Prof. Leonardo MICHELI, Dr. Alae AZOUZOUTE

 <p>09:45-10:20</p>		<p><b>Dr. Álvaro FERNÁNDEZ SOLAS</b>, Industrial Engineer &amp; Scientific Researcher at DLR (German Aerospace Center). PhD in Photovoltaic Energy</p> <p><i>Title: Introduction to soiling and modelling approaches</i></p>
 <p>10:45-11:20</p>		

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 10:20-10:55  11:20-11:55		<p><b>Mr. Thore MÜLLER</b>, Co-Founder, serving as Chief Executive Officer (CEO) at (PVRADAR, Germany)</p> <p><u>Title:</u> <i>Soiling modelling through Python</i></p>
 10:55-11:30  11:55-12:30		<p><b>Dr.-Ing. Fabian WOLFERTSTETTER</b>, Product Owner Photovoltaics, Volateq GmbH</p> <p><u>Title:</u> <i>Combining Quantitative Soiling Detection and Thermography for Improved Solar Field Performance Optimization</i></p>
 11:30-12:05  12:30-13:05		<p><b>Prof. Leonardo MICHELI</b>, Associate Professor, Dept. of Astronautical, Electrical and Energy Engineering (DIAEE) Sapienza University of Rome, Italy</p> <p><u>Title:</u> <i>Challenges in soiling mapping and mitigation</i></p>
<b>WRAP-UP AND TAKEAWAY (20 MIN. DISCUSSION) / ALL SPEAKERS PRESENT</b>		

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TWO HOURS TUTORIAL ON FIRST-PRINCIPLES DENSITY FUNCTIONAL THEORS (DFT) SIMULATION OF VARIOUS NOVEL 2D MATERIALS FOR ENERGY STORAGE AND ADVANCED ELECTROCHEMICAL SOLAR ENERGY CONVERSION TO GREEN HYDROGEN AND CARBONE DIOXIDE REDUCTION: LEARNING FROM THE NATURE



**Prof. Abdelilah BENYOUSSEF**, Hassan II Academy of Sciences and Technology, Rabat, Morocco LaMCScl, Faculty of Sciences, Mohammed V University, Rabat, Morocco

Title: *First-principles density functional theors (DFT) simulation of various novel 2d materials for energy storage*

PART 1 / 12:20-13:20

PART 2 / 13:35-14:35



Moderator: Prof. Ahmed ENNAOUI, NN



**Prof. Ahmed ENNAOUI**, President of the scientific council of IRESEN, Former head of research group at Helmholtz Center Berlin for Materials and Energy

Title: *Tutorial on advanced electrochemical solar energy conversion to green hydrogen and carbone dioxide reduction: learning from the nature*

PART 1 / 14:50-15:35

PART 2 / 15:50-16:35



15:50-16:35

16:50-17:35



Moderator: Prof. Abdelilah BENYOUSSEF, NN

WRAP-UP AND TAKEAWAY (20 MIN. DISCUSSION) / ALL SPEAKERS PRESENT

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# INDUSTRY TALK PANEL

Moderator: Dipl. Ing. Badr IKKEN



16:55 - 18:55



**Dipl. Ing. Badr IKKEN**, Executive-President of Gi3 / Managing partner of Gi2 / Chairman of the Morocco-Germany Business Council - CGEM Member of the Board of Directors of the German Chamber of Commerce AHK Morocco







**Dr. Ismail AKALAY**, Chief Executive Officer of Sonasid and Former general manager cobalt and base metals general manager cobalt and base metals Manager

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	<p><b>Dr. Samir RACHIDI</b>, Managing Director, Institut de Recherche en Énergie Solaire et Énergies Nouvelles (IRESEN)</p>
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