



PRINCE MOHAMMAD BIN FAHD  
**UNIVERSITY**

**UAEU**

The 7<sup>th</sup> International Conference on RENEWABLE  
ENERGY GENERATION AND APPLICATION

# ICREGA 2024

April 21 - 24, 2024

Department of Electrical Engineering  
College of Engineering  
Prince Mohammad Bin Fahd University  
Al-Khobar, Saudi Arabia



**Conference Program**

# Program-at-a-Glance

- All times are Saudi Arabia time zone (GMT +3)

**Sunday, April 21<sup>st</sup> 2024**

<b>Pre-conference Workshop</b>	13:00 – 16:00	G-015 Robotics Lab
--------------------------------	---------------	-----------------------

## **The Potential of Adopting 3D Printing in the Energy Sector: Applications and Challenges**

*Dr. Waleed Ahmed, Mechanical Engineering Department, United Arab Emirates University, Al Ain, UAE*

*Prof. Mousa Hussein, Electrical Engineering Department, United Arab Emirates University, Al Ain, UAE*

# Program-at-a-Glance

- All times are in Saudi Arabia local time (GMT +3)

**Monday, April 22<sup>nd</sup> 2024**

<b>Registration</b>	8:00 – 16:00	Atrium COBA
<b>Opening</b>	9:30 – 9:45	Lecture Hall COBA
<b>Welcome Speech</b> <b>Dr. Faisal Al Anezi</b> <i>General Chair</i> <i>Prince Mohammad Bin Fahd University</i> <i>Khobar, Saudi Arabia</i>	9:45 – 10:00	Lecture Hall COBA
<b>Keynote Lecture 1</b>  <b>Role of the Smart Grid in Facilitating the Integration of Renewables into the Power Grid</b>  <b>Prof. Saifur Rahman</b> <i>Director, Virginia Tech Advanced Research Institute, USA</i> <i>President, IEEE Power &amp; Energy Society, 2018 and 2019</i> <i>2023 IEEE President &amp; CEO</i>	10:00 – 10:45	Lecture Hall COBA
<b>Coffee Break</b>	10:45 – 11:00	Atrium COBA
<b>Technical Sessions</b>	11:00 – 13:00	G-031, G-033 COBA
<b>Lunch</b>	13:00 – 14:00	Atrium Admin Building
<b>Technical Sessions</b>	14:00 – 16:00	G-031, G-033 COBA
<b>Gala Dinner</b>	16:00 – 20:00	Heritage Village

# Program-at-a-Glance

- All times are in Saudi Arabia local time (GMT +3)

**Tuesday, April 23<sup>rd</sup> 2024**

<b>Registration</b>	8:00 – 16:00	Atrium COBA
<b>Keynote Lecture 2</b>  <b>Recent Advances in Inverter and Battery Integration in PV Systems</b>  <b>Prof. Issa Batarseh</b> <i>Director, Florida Power Electronics Center</i> <i>Professor, University of Central Florida, USA</i>	10:00 – 10:45	Lecture Hall COBA
<b>Coffee Break</b>	10:45 – 11:00	Atrium COBA
<b>Technical Sessions</b>	11:00 – 13:00	G-031, G-033 COBA
<b>Lunch</b>	13:00 – 14:00	Atrium Admin Building
<b>Technical Sessions</b>	14:00 – 16:00	G-031, G-033 COBA
<b>Industry Sessions: GCC Labs</b>	14:00 – 16:00	Lecture Hall COBA
<b>Social Event</b>	16:00 – 20:00	Ithraa

# Program-at-a-Glance

- All times are in Saudi Arabia local time (GMT +3)

**Wednesday, April 24<sup>th</sup> 2024**

<b>Registration</b>	8:00 – 15:00	Atrium COBA
<b>Keynote Lecture 3</b>  <b>Empowering the Future: Deep Learning for Sustainable Battery Management</b>  <b>Dr. Abdallah Chehade</b> <i>Director, Informatics, Reliability, and Data Analytics Lab</i> <i>Associate Professor, University of Michigan-Dearborn,</i> <i>USA</i>	10:00 – 10:45	Lecture Hall COBA
<b>Coffee Break</b>	10:45 – 11:00	Atrium COBA
<b>Technical Sessions</b>	11:00 – 13:00	G-031 COBA
<b>Industry Sessions: ENOWA - NEOM</b>	11:00 – 13:00	Lecture Hall COBA
<b>Lunch</b>	13:00 – 14:00	Atrium Admin Building
<b>Technical Sessions</b>	14:00 – 15:00	G-031 COBA

# Technical Sessions

## Session 1A: Renewable Energy Systems, Technologies, Applications & Materials

Monday, April 22 | 11:00 – 13:00 | Room G-031 COBA Building

Session Chair: Dr. Ala Al-Haj Hussein

**Paper ID: 6 | Time: 11:00 – 11:20**

**Analysis of Thermal Efficiency of Solar Flat Plate Collector Working with Hybrid Nano fluids: An Experimental Study**

*Lingala Syam Sundar, Solomon Mesfin and Veeredhi Vasudeva Rao  
Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 17 | Time: 11:20 – 11:40**

**Potential Uses of Renewable Energy in Construction: Advantages and Challenges**

*Essam Zaneldin, Waleed Ahmed, Betiel Paulos, Feruz Gabir, Makda Araya, El Bethel Muluye and Deborah Debele  
United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 21 | Time: 11:40 – 12:00**

**A Novel Approach to Address Reliability Concerns of Wind Turbines**

*Sorena Artin  
Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 33 | Time: 12:00 – 12:20**

**Power Systems Stability of High Penetration of Renewable Energy Generation**

*Ahmad Harb and Hamza Alnawafleh  
German Jordan University, Madaba, Jordan*

**Paper ID: 37 | Time: 12:20 – 12:40**

**Exploring Sustainable Micro Milling: Investigating Size Effects on Surface Roughness for Renewable Energy Potential**

*Ahmet Hascelik, Kubilay Aslantas and Waleed Ahmed  
United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 43 | Time: 12:40 – 13:00**

**Vibration Analysis of 3D Printed PLA Beam with Honeycomb Cell Structure for Renewable Energy Applications and Sustainable Solutions**

*Kubilay Aslantas, Ekrem Özkaya and Waleed Ahmed  
United Arab Emirates University, Al Ain, United Arab Emirates*

# Technical Sessions

## Session 2A: Sustainability and Green Economy

Monday, April 22 | 11:00 – 13:00 | Room G-033 COBA Building

Session Chair: Dr. Samir El Nakla

**Paper ID: 4 | Time: 11:00 – 11:20**

**Batch reactor production of Biogas from Industrial Wastewater of chalawa, kano, as an Alternative Energy for Sustainable Development in Nigeria**

*Garba Uba and Abdulhadi Yakubu*

*Jigawa State polytechnic Dutse, Jigawa, Nigeria*

**Paper ID: 8 | Time: 11:20 – 11:40**

**Green and Environmental-Friendly Material for Sustainable Buildings**

*Noura Al-Mazrouei, Amged Elhassan, Waleed Ahmed, Ali H. Al-Marzouqi and Essam Zanldin*

*United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 10 | Time: 11:40 – 12:00**

**Techno-Economic Comparison between PV and Wind to Produce Green Hydrogen in Jordan**

*Zaid Hatamleh and Ahmad Al Miaari*

*King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia*

**Paper ID: 14 | Time: 12:00 – 12:20**

**Sustainability Policies and Regulation Challenges in Recycling EV Batteries**

*Afnan Khalil, Mousa Hussein, Essam Zanelidin and Waleed Ahmed*

*United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 35 | Time: 12:20 – 12:40**

**Assessment of utilizing solar energy to enhance the performance of vertical aeroponic farm**

*Esam Jassim, Bashar Jasem and Faramarz Djavanroodi*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 40 | Time: 12:40 – 13:00**

**From Smart Soles to Green Goals, Interlacing Sustainable Innovations in the Age of Smart Health: An Exploratory Search**

*Fahd Koraiiche, Amine Dehbi and Rachid Dehbi*

*Université Hassan II, Faculté des Sciences Ben M'Sik, Casablanca, Morocco*

# Technical Sessions

## Session 1B: Renewable Energy Systems, Technologies, Applications & Materials

Monday, April 22 | 14:00 – 16:00 | Room G-031 COBA Building

Session Chair: Dr. Jawad Al Asad

**Paper ID: 66 | Time: 14:00 – 14:20**

**On the Performance Assessment of King Faisal University Grid-Connected Solar PV Facility**

*Mounir Bouzguenda*

*King Faisal University, Hofuf, Saudi Arabia*

**Paper ID: 71 | Time: 14:20 – 14:40**

**An Automated and Cost-efficient Method for Photovoltaic Dust Cleaning based on Biaxially Oriented Polyamide Coating Material**

*Said Halwani, Mena Maurice Farag, Abdul Kadir Hamid and Mousa Hussein*

*United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 73 | Time: 14:40 – 15:00**

**Vibration harvesting techniques for electrical power generation – review**

*Omar D Mohammed, Isha Bubshait, Reyounf Alqahtani, Kawther Almenayan, Semat Alzaher and Reem Alhussain*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 80 | Time: 15:00 – 15:20**

**A Developed System Design for Blue Energy Generation**

*Omar D Mohammed, Saud Alharbi, Shoja Alharbi, Waleed Aldhuwaihi and Nasser Bini Hameem*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 81 | Time: 15:20 – 15:40**

**A Review of the Renewable Energy Technologies and Innovations in Geotechnical Engineering**

*Eman J. Bani Ismaeel, Samer Rababah, Mohammad Ali Khasawneh, Nayeemuddin Mohammed and Danish Ahmed*

*Jordan University of Science & Technology, Irbid, Jordan*

**Paper ID: 83 | Time: 15:40 – 16:00**

**Renewable Energy in Pavement Engineering and its Integration with Sustainable Materials: A Review Paper**

*Mohammad Ali Khasawneh, Danish Ahmed, Fawzyah Alkhammas, Zainab Almshar, Maryam Hussain, Dalya Alshali, Maryam Alkhuraim, Rana Aldawood, Hidaia Alzayer and Nayeemuddin Mohammed*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*



# Technical Sessions

## Session 2B: Sustainability and Green Economy

Monday, April 22 | 14:00 – 16:00 | Room G-033 COBA Building

Session Chair: Dr. Sadiq Alhuwaidi

**Paper ID: 13 | Time: 14:00 – 14:20**

**Exploiting Cow Dung Biopellets as a Renewable Solid Biofuel for Advancing Sustainable Development**

*Salisu Ahmed, Musa Abdullahi and Abubakar Ahmad*

*Jigawa State Polytechnic, Dutse, Jigawa State, Nigeria*

**Paper ID: 16 | Time: 14:20 – 14:40**

**Renewable Energy Sources, Sustainability Aspects and Climate Alteration- A Comprehensive Review**

*M. Amin Mir, M. Waqar Ashraf and Kim Andrews*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 46 | Time: 14:40 – 15:00**

**Potential Use of Reject Brine Waste as a Sustainable Construction Material**

*Seemab Tayyab, Essam Zaneldin, Waleed Ahmed and Ali Al Marzouqi*

*United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 70 | Time: 15:00 – 15:20**

**Role of Renewable Energy in Decarbonisation process: Case Study in KSA**

*Samar Dernayka, Saidur R. Chowdhury and Mohammad Khasawneh*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 78 | Time: 15:20 – 15:40**

**Electricity Sector Reforms In Saudi Arabia and their Impact on Demand Growth and Development of Renewable Energy**

*Samir El-Nakla, Chedly Belhadj Yahya, Jamal Nayfeh*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 79 | Time: 15:40 – 16:00**

**Optimising Solar: A Techno-Economic Assessment and Government Facility Compensation Framework Power Generation**

*Navaid Ali, Dr. Faheem Ullah Shaikh and Dr. Laveer Kumar*

*Mehran University of Engineering and Technology, Jamshoro, Sindh, Pakistan*

# Technical Sessions

## Session 3A: Emerging Technologies and Applications

Tuesday, April 23 | 11:00 – 13:00 | Room G-031 COBA Building

Session Chair: Dr. Jamil Bakhshwain

**Paper ID: 5 | Time: 11:00 – 11:20**

### **Electroluminescence Images Based Defective Photovoltaic (Solar) Cell Detection Using Modified Deep Convolution Neural Network**

*Hiren Mewada, L. Syam Sundar, Hiren Kumar Thakkar and Miral Desai*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 22 | Time: 11:20 – 11:40**

### **Solar Radiation Forecasting using Attention-based Temporal Convolutional Network**

*Damilola Olawoyin-Yussuf, Mohamad Mohandes, Bo Liu and Shafiqur Rehman*

*King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia*

**Paper ID: 23 | Time: 11:40 – 12:00**

### **Application of Artificial Intelligence (AI) in Wind Energy System with a Case Study**

*Fay Alzahrani, Feroz Shaik, Nayeemuddin Mohammed and Nasser Al-Na'Abi*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 32 | Time: 12:00 – 12:20**

### **Prediction of Distillate Output in Photocatalytic Solar Still Using Artificial Intelligence (AI)**

*Reyouf Alqahtani, Feroz Shaik, Nayeemuddin Mohammed, Mohammad Ali Khasawneh and Tasneem Sultana*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 41 | Time: 12:20 – 12:40**

### **Water and Electricity Consumption Management Architectures Using IoT and AI: A Review Study**

*Oumaima Rhallab, Amine Dehbi and Rachid Dehbi*

*Université Hassan II, Faculté des Sciences Ain chok, Casablanca, Morocco*

**Paper ID: 50 | Time: 12:40 – 13:00**

### **Date Fruit Type Classification using Convolutional Neural Networks**

*Abdullah Alavi, Md Faysal Ahamed, Ali Albeladi and Mohamed Mohandes*

*King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia*

# Technical Sessions

## Session 4A: Modeling, Control and Simulation

Tuesday, April 23 | 11:00 – 13:00 | Room G-033 COBA Building

Session Chair: Dr. Christakis Papageorgiou

**Paper ID: 19 | Time: 11:00 – 11:2**

**Design of a Stable and Robust  $H^\infty$  Loop-Shaping Controller for LCL Filter Based Grid-Tied Inverter**

*Mahdi Debouza and Rachid Errouissi*

*United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 20 | Time: 11:20 – 11:40**

**Adaptive cooling framework for Photovoltaic systems: A seasonal investigation under the terrestrial conditions of Sharjah, UAE**

*Mena Maurice Farag, Abdul Kadir Hamid and Mousa Hussein*

*United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 42 | Time: 11:40 – 12:00**

**A Comprehensive Review on Computing methods for the prediction of energy cost in Kingdom of Saudi Arabia**

*Nayeemuddin Mohammed, Andi Asiz, Mohammad Ali Khasawneh, Feroz Shaik, Hiren Kumar Kantilal Mewada and Tasneem Sultana*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 44 | Time: 12:00 – 12:20**

**Effect of Loading Modes for Different Dimensions of a Reduced Tee Internal Pressure**

*Sofiane Maachou, Mohamed Mokhtari and Abdeldjalil Benbakhti*

*University Centre of Maghnia, Maghnia, Algeria*

**Paper ID: 48 | Time: 12:20 – 12:40**

**Adaptive Neuro-Fuzzy Inference System for DC Power Forecasting for Grid-Connected PV System in Sharjah**

*Tareq Salameh, Mena Maurice Farag, Abdul Kadir Hamid and Mousa Hussein*

*United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 60 | Time: 12:40 – 13:00**

**Sliding Mode Control for Grid Integration of Point Absorber type Wave Energy Converter**

*Abdin Elamin and Addy Wahyudie*

*United Arab Emirates University, Al Ain, United Arab Emirates*

# Technical Sessions

## Session 3B: Emerging Technologies and Applications

Tuesday, April 23 | 14:00 – 16:00 | Room G-031 COBA Building

Session Chair: Dr. Adil Khan

**Paper ID: 53 | Time: 14:00 – 14:20**

### **AI-Based PV Panels Inspection using an Advanced YOLO Algorithm**

*Agus Haeruman, Sami Ul Haq, Mohamed Mohandes, Shafiqur Rehman and Sheikh Sharif Iqbal  
King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia*

**Paper ID: 55 | Time: 14:20 – 14:40**

### **Impact of Artificial Intelligence (AI) in Martian Architecture (exterior and interior)**

*Lindita Bande, Jose Berengueres, Aysha Alsheraifi, Anwar Ahmad, Saud Alhammadi, Almaha Alneyadi, Amna Alkaabi, Maitha Altamimi and Yosan Asmelash  
United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 62 | Time: 14:40 – 15:00**

### **The Utilization of IoT-Based Humidity Monitoring Method and Convolutional Neural Networks for Orchid Seed Germination**

*Muhammad Ridhan Firdaus, Hilal H. Nuha, Mohamed Mohandes and Agus Haeruman  
Telkom University, Bandung, Indonesia*

**Paper ID: 63 | Time: 15:00 – 15:20**

### **Ameliorated Crowd Management through AI**

*Ali Khan and Mohamed Mohandes  
King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia*

**Paper ID: 64 | Time: 15:20 – 15:40**

### **Intelligent Solutions for Modern Agriculture: Leveraging Artificial Intelligence in Smart Farming Practices**

*Fatima Zahrae Berrahal and Amine Berqia  
Mohammed V University, Rabat, Morocco*

**Paper ID: 67 | Time: 15:40 – 16:00**

### **Solar Energy Powered Smart Water Heating System**

*Ahmed Alturki, Yahya Almahzari, Majid Alblooshi, Faris Alghamdi, Ahmed A. Hussain, Ala A. Hussein and Jamal Nayfeh  
Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

# Technical Sessions

## Session 4B: Modeling, Control and Simulation

Tuesday, April 23 | 14:00 – 16:00 | Room G-033 COBA Building

Session Chair: Mr. Ahmad Abul Hussain

**Paper ID: 7 | Time: 14:00 – 14:20**

**Real-Time Hardware Implementation of Novel Automate Water Recycling Mechanism for Cleaning of Solar PV Modules**

*Mohammad Rizwan and Abdul Azeem*

*Delhi Technological University, Delhi, India*

**Paper ID: 11 | Time: 14:20 – 14:40**

**Analytical and numerical evaluation for wind turbine aerodynamic characteristics**

*Ashraf Abdelkhalig, Mahmoud Elgendi, Mohamed Y.E. Selim, Maryam Almallahi and Sara Maen Asaad*

*United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 28 | Time: 14:40 – 15:00**

**Improvement of management algorithm of a transformable photovoltaic-wind system**

*Yahya Lahlou*

*Ibn Tofail University, Kenitra, Morocco*

**Paper ID: 47 | Time: 15:00 – 15:20**

**Bidding Optimization for a Reverse Osmosis Desalination Plant with Renewable Energy In a Day Ahead Market Setting**

*Ebaa Al Nainoon and Ali Al Awami*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 61 | Time: 15:20 – 15:40**

**Design and Fabrication of Low Temperature Flat Plate Collector for Domestic Water Heating**

*Abdulkrim Almutairi, Abdulrahman Almarul, Riyadh Alnafessah, Abbas Hassan Abbas Atya, Sheroz Khan and Noor Maricar*

*Onizah Colleges, Onizah, Saudi Arabia*

**Paper ID: 82 | Time: 15:40 – 16:00**

**Theoretical Modeling to Analyze the Thermal Energy Efficiency and Exergy Efficiency of Double Air-Pass Solar Tunnel Drying with Recycled Organic Waste Material**

*Dagim Kebede Gari, A Venkata Ramayya and Lingala Syam Sundar*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

# Technical Sessions

## Session 5A: Modeling, Control and Simulation

Wednesday, April 24 | 11:00 – 13:00 | Room G-031 COBA Building

Session Chair: Dr. Hiren Mewada

**Paper ID: 3 | Time: 11:00 – 11:20**

**Cyclic Voltammetry and Characterization Studies of Electrodeposited Copper-Indium for Thin-Film Solar Cell Application**

*Leher Farooq*

*United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 36 | Time: 11:20 – 11:40**

**Energy Efficiency and Sustainability Enhancement of Electric Discharge Machines by Incorporating Nano-Graphite**

*Asaad Ali Abbas, Raed.R Shwaish, Shukry.H. Aghdeab and Waleed Ahmed*

*United Arab Emirates University, Al Ain, United Arab Emirates*

**Paper ID: 52 | Time: 11:40 – 12:00**

**Li-ion Batteries Life Cycle from Electric Vehicles to Energy Storage**

*Muhammad Rashid, Muhammad Sheikh and Sheikh Rehman*

*University of Warwick, Coventry, United Kingdom*

**Paper ID: 58 | Time: 12:00 – 12:20**

**Smart Cities and Intelligent Transportation Systems: Integration of Autonomous Vehicles and Their Impact on Congestion and Safety**

*Eman Algherbal and Nedal Al-Ratrout*

*King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia*

**Paper ID: 69 | Time: 12:20 – 12:40**

**Solar PV based Charging Station for Electric Vehicles**

*Raghad Alghamdi, Batool Alsunbul, Raghad Almutairi, Rania Alnassar, Maha Alhajri, Saifullah Shafiq, Samir El-nakla, Ahmed Abul Hussain, Jamal Nayfeh*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 77 | Time: 12:40 – 13:00**

**Multiport Universal Solar Power Bank**

*Abdullah Altelmessani, Abdulqader Aljaber, Turki Altuwairqi, Ala Hussein and Jamal Nayfeh*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

# Technical Sessions

## Session 5B: Modeling, Control and Simulation

Wednesday, April 24 | 14:00 – 15:00 | Room G-031 COBA Building

Session Chair: Mr. Wael Suliman

**Paper ID: 49 | Time: 14:00 – 14:20**

**Robust testing requirements for Li-ion battery performance analysis**

*Muhammad Sheikh, Muhammad Rashid and Sheikh Rehman*

*University of Warwick, Coventry, United Kingdom*

**Paper ID: 51 | Time: 14:20 – 14:40**

**Bidding Optimization for Hydrogen Production from an Electrolyzer**

*Nouf Almutairy and Ali Alawami*

*Prince Mohammad Bin Fahd University, Khobar, Saudi Arabia*

**Paper ID: 68 | Time: 14:40 – 15:00**

**Experimental investigation on the thermal and exergy efficiency for a 2.88 kW Grid connected photovoltaic/thermal system**

*Mena Maurice Farag, Tareq Salameh, Abdul Kadir Hamid and Mousa Hussein*

*United Arab Emirates University, Al Ain, United Arab Emirates*