ReDEC 2014
2nd International Conference on Renewable Energy for Developing Countries
November 26-27, 2014
Order of Engineers and Architects
Jnahn, Beirut, LEBANON
A Welcome Message from the Conference General Chairs

REDEC 2014 is an international conference aimed to focus on the latest achievements and perhaps breakthroughs in the area of renewable energy technology advancement. It is a scientific conference that offers an ideal forum for technical exchange and networking. A set of enabling technologies on modernization of the electric power grid, integration of renewable energy technologies, energy storage devices and renewable energy sources that are intended to help moving the world toward more energy sustainability will be presented.

During the first REDEC 2012 conference, more than 120 participants have discussed the scientific issues that were presented and subsequently published in IEEEXplore. The success of REDEC 2012 has encouraged the organizing committee to launch REDEC 2014 with more extended themes aimed to bring additional focus on important topics that were not sufficiently covered previously.

Renewable energies sources like solar, wind, geothermal, biomass and others types are extensively discovered by developing countries. Although some of these countries are involved in very important renewable energy projects, most of them suffer from lack of scientific and economic planning, reduced financial means, and technical knowhow. These are the major reasons why developing countries are not yet taking full advantages from these resources. This conference will give opportunities to participant researchers coming from different countries to discuss scientific issues that help improving the renewable energy production and propose efficient technique to its consumption. The suggested solutions and strategies that will be presented in this conference may encourage investors to support the implementation of new renewable energy generation stations.

ALMEE, OEA, IEEE IES and IEEE Lebanon Section are our major supporters who offered all the financial and logistic means for the success of the conference. LU, USJ, NDU, USEK and ULF are the universities in Lebanon who gave the conference the scientific and academic profile by organizing scientific sessions with high level papers to be presented and thereafter published in IEEEXplorer data base of IEEE. We had the chance to be supported by internationally known partners in the energy domain like ETS in Montreal Canada, ADEME, IMEDER and MEDENER.

Great thanks to the REDEC2014 Keynote Speakers who accepted to be among us and share most important technology advancement related to the penetration of renewable energies sources in existing electric network especially in developing countries. The common ESCWA/AUB CBM project took in charge all necessary financial and logistic matters for hosting the distinguished keynote speakers.

REDEC 2014 is hosted in the premises of the Order of Engineers in Beirut which is the city of five thousand years of history encompassing mixed rich cultures throughout the civilization evolved throughout the years. You are invited to discover ruins in Beirut downtown where you can find traces of Phoenician, Hellenistic, Roman, Byzantine, Arab, Crusader and Ottoman civilizations. Visit Beirut is a great opportunity to see how contrasts in the architecture, in the convictions, and in Lifestyle may coexist.

Welcome to REDEC 2014 conference and we wish you a successful conference that meets your expectations.

Prof. Imad Mougharbel

Prof. Kamal Al-Haddad
General Information

Conference Venue:

Science, art, culture and entertainment give an insight into the social life of the capital of Lebanon, Beirut. This wonderful city is a melting pot of several cultures. Arabic traditions, oriental and western influences offer a perfect blend of a specific society in the world. Art has formed an integral part of Beirut’s history. The oldest universities in the Middle East region were established in this city. The Order of Engineers and Architects located in Beit Al-Mohandes Street, Jnah, will host the conference on November 26-27, 2014. For more information on the venue, please visit the website: www.oea.org.lb.

Map of the city of Beirut

Conference Objectives:

Some developing countries are actually active in the domain of exploiting renewable energies. They are doing efforts in order to progress towards a green future. They tend to be in conformity with international requirements to protect the environment. Also, some projects are implemented in these countries in order to reduce their external energy dependence. Although the willingness for introducing renewable energies is apparent, there are still important economic constraints preventing them from investing in this hot area.
National strategies in these countries need to be enforced with more appropriate technical solutions and more accurate data acquisition of resources. A common vision among national stakeholders in the domain of renewable energies should be considered. Laws and regulatory issues need to be more adapted. The conference aim is to benefit from international experience and discuss innovative scientific solutions adapted to the developing countries situations. Researchers from local and foreign universities will suggest during this conference solutions for specific problems. Professionals will find the opportunity to know about the most efficient way for investing in renewable energies in these countries. Case Studies on successful solutions and on supporting programs will be presented. The adaptation of laws and regulations will be discussed for an easy penetration of renewable energies in developing countries.

**Conference Topics:**

1. Renewable Energy Resources: wind, solar, biomass, hydraulic, geothermal, waves, tidal, etc.
5. Developing countries policies and laws related to renewable energy penetration, capacity building for the needs of developing countries.
6. Appropriate technologies and mechanisms for providing energy services in rural areas of developing countries.
7. Implementation of educational and research programs in the fields of renewable energy.
8. Regional and international supporting programs for the penetration of renewable energy in developing countries.

**Oral Presentations:**

Follow please the following instructions:

- Each author/presenter is allowed for 20 minutes maximum for each paper. The length of the presentation is restricted to 15 minutes, plus 5 minutes for questions.
- REDEC 2014 presenters are required to meet their session chairman in the session room, 15 minutes before starting the session in order to download from a USB memory their power point or PDF presentation to the computer.
- Each author/presenter has to make sure that the session chairman is provided with a very short biography on the presenter if not it will be hand written on the spot.
Each author/presenter must assure that all fonts needed for his presentation are compatible with Microsoft Office 2007 (it is not recommended to use its own computer in order to save time).

Registration:

Authors of accepted papers should register and present their work in the conference in order to be included in the IEEEXplore database. The registration can be made online through the conference website or at the registration desk during the conference. All authors who have paid full registration fees are asked to pick up their conference set at the registration desk.
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## REDEC 2014 Conference at a Glance

### Wednesday, November 26, 2014

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### Thursday, November 27, 2014

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<td>Wind Generation Systems and Smart Grids</td>
<td>Oral session 6 Solar and Thermal Energy</td>
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<td>16:40 – 17:00</td>
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REDEC 2014 Conference Program

**Wednesday, November 26, 2014**

08:30 – 09:00  Registration

09:00 – 09:30  Opening session  
**Conference Chair**  
Representative of IEEE Lebanon Section  
Representative of ALMEE  
Director of AUF  
President of the OEA in Beirut

09:30 – 09:45  ESCWA presentation on Capacity Building

09:45 – 10:30  Plenary session  
**Richard Cantin**  
*École Nationale des Travaux Publics de l'État, France*  
Integration of Solar Technologies in Buildings

10:30 – 11:00  Coffee break

11:00 – 13:00  Oral sessions

**Session 1:**  
**French session**

**Room:**  
A

**Session Chair:**  
Gilbert Menguy, *Université Libano-Française, Liban*

11:00 – 11:15  *Énergies Renouvelables : Évolution de la Formation 1970-2010*  
Gilbert Menguy, *ULF & Ex-professeur à l'Université de Lyon*

11:15 – 11:30  *Création d’un Bureau d’Études Dédié au Solaire*  
Bassam Ouiada, *Ex-directeur Trans-énergie*

11:30 – 11:45  *Politique d'Intégration des Énergies Renouvelables dans les Pays en Voie de Développement*  
Angela Khalil, *USEK, Liban*

11:45 – 12:00  *Changements Climatiques en Algérie : Impacts et Mesures*  
Menouer Boughedaaoui, *Université de Blida, Algérie*

12:00 – 12:20  *Développement de Modèle Numérique pour la Conception d’un Séchage Solaire Sous Serre des Produits Alimentaires*  
Motafa Al-Masri, *Université Libanaise, Liban*  
Khalil Kahine, *Université Libanaise, Liban*
12:20 – 12:40 **L’ADALINE pour l'Identification des Paramètres du Filtre d'un Redresseur à MLI**  
Ali Bechouche, *Université de Tizi Ouzou, Algérie*  
Djaffar Ould Abdeslam, *Université de Haute-Alsace, France*  
Hamid Seddiki, *Université de Tizi Ouzou, Algérie*  
Koussaila Mesbah, *Université de Tizi Ouzou, Algérie*

12:40 – 13:00 **Recherche en Énergétique du Bâtiment : Enjeux et Perspectives**  
Richard Cantin, *Directeur de Recherches à l’ENTP, Lyon*

**Session 2:** Bioprocess and Bioenergy

**Room:** B

**Session Chairs:** Richard Maroun, *Saint-Joseph University, Lebanon*  
Khalil Kahine, *Lebanese University, Lebanon*

11:00 – 11:20 **Thermochemical Liquefaction of Atlantic Pistacia to Produce Bio-Oils**  
Chantal Kassargy, *Lebanese University, Lebanon*  
Sary Awad, *Ecole des Mines de Nantes, France*  
Karim Kiari, *Ecole des Mines de Nantes, France*  
Khalil Kahine, *Lebanese University, Lebanon*  
Mohand Tazerout, *Ecole des Mines de Nantes, France*

11:20 – 11:40 **Study of Intensification of Vaporization by Decompression to the Vacuum (IVDV) as an Environment-friendly Process on the Expansion of Maize**  
Rachelle Mrad, *Saint-Joseph University, Lebanon*  
Richard Maroun, *Saint-Joseph University, Lebanon*  
Nicolas Louka, *Saint-Joseph University, Lebanon*

11:40 – 12:00 **Bio-Hydrogen Production by Coupling of an Electrochemical System with a Biological Treatment**  
Rawa Abdallah, *University of Rennes 1 & UL, France*  

12:00 – 12:20 **Industrial Byproducts Valorization through Energy-Saving Processes – Alkaline Extraction of Polyphenols from Vine Shoots**  
Hiba Rajha, *Saint-Joseph University, Lebanon*  
Nagham Abou Jaoude, *Saint-Joseph University, Lebanon*  
Nicolas Louka, *Saint-Joseph University, Lebanon*  
Eugene Vorobiev, *Université de Technologie de Compiègne, France*  
Richard Maroun, *Saint-Joseph University, Lebanon*

12:20 – 12:40 **Organic Municipal Solid Waste Gasification for Electricity Production**  
Chantal Maatouk, *Saint-Joseph University, Lebanon*  
Lara Azzi, *Saint-Joseph University, Lebanon*  
Rayan Hijazi, *Saint-Joseph University, Lebanon*
12:40 – 13:00  A New Eco-Friendly Defatting Process of Peanuts by Mechanical Expression Preserving Structure Integrity (MEPSI)
Joelle Nader, *Saint-Joseph University, Lebanon*
Charbel Afif, *Saint-Joseph University, Lebanon*
Nicolas Louka, *Saint-Joseph University, Lebanon*

13:00 – 14:30  Lunch

14:30 – 15:15  Keynote session
*Nesreen Ghaddar*
*American University of Beirut, Lebanon*
Solar Powered Absorption, Desiccant Cooling, and PVT Technologies for Air Conditioning in Hot Humid Climate

15:15 – 15:30  Break

15:30 – 17:30  Oral sessions

**Session 3:**  Fuel Cells, Hydro and Wave Energy

**Room:**  A

**Session Chairs:**  Nazih Moubayed, *Lebanese University, Lebanon*
Rita Najjar, *ALMEE, Lebanon*

15:30 – 15:50  Technical Feasibility Study of Solar-Pumped Hydro Storage in Lebanon
George El-Jamal, *Saint-Joseph University, Lebanon*
Hussein Ibrahim, *Wind Energy TechnoCentre, Canada*
Ali H. Assi, *Lebanese International University, Lebanon*
Mazen Ghandour, *Lebanese University, Lebanon*

Julie Metri, *Saint-Joseph University, Lebanon*
Christel Saadeh, *Saint-Joseph University, Lebanon*
Hadi Y. Kanaan, *Saint-Joseph University, Lebanon*

16:10 – 16:30  Contribution to Clean Energy Production using a Novel Wave Energy Converter
Charbel Bou-Mosleh, *Notre-Dame University, Lebanon*
Pierre Rahme, *Notre-Dame University, Lebanon*
Peter Beaino, *Notre-Dame University, Lebanon*
Rebecca Mattar, *Notre-Dame University, Lebanon*
Elie Abi Nassif, *Notre-Dame University, Lebanon*
16:30 – 16:50 Simulink Model for a PEM Electrolyzer Based on an Equivalent Electrical Circuit
Anissia Beainy, Saint-Joseph University, Lebanon
Nabil Karami, LSIS Aix-Marseille University, France
Nazih Moubayed, Lebanese University, Lebanon

16:50 – 17:10 Comparative Study between P&O and Incremental Conductance for Fuel Cell MPPT
Nabil Karami, LSIS Aix-Marseille University, France
Lama El-Khoury, Saint-Joseph University, Lebanon
Gabriel Khoury, Saint-Joseph University, Lebanon
Nazih Moubayed, Lebanese University, Lebanon

Session 4: Biofuels and Waste-to-Energy
Room: B
Session Chairs: Adel Mourtada, ALMEE, Lebanon
Youssef Abou Jawdah, American University of Beirut, Lebanon

15:30 – 15:50 Biodiesel Production from Freshwater Algae in Qaraoun Lake in Lebanon
Adel Mourtada, ALMEE, Lebanon
Elias Harb, Saint-Joseph University, Lebanon

15:50 – 16:10 Potential Biodiesel Production from Mixed Phytoplankton Cultures Collected off the Lebanese Coast
O. Abdelkader, American University of Beirut, Lebanon
S. Hamati, American University of Beirut, Lebanon
Maan Jawhari, American University of Beirut, Lebanon
Rewa Seblani, American University of Beirut, Lebanon
Z. Mrad, American University of Beirut, Lebanon
Youssef Mouneimne, American University of Beirut, Lebanon
Kamal Bou Hadir, American University of Beirut, Lebanon
I. Saoud, American University of Beirut, Lebanon
I. Tzovenis, EEXI, Greece
Youssef Abou Jawdah, American University of Beirut, Lebanon

16:10 – 16:30 Potential Biodiesel Production from Four Green Microalgae Cultures Collected off the Lebanese Coast
D. Saleh, American University of Beirut, Lebanon
L. Hanna, American University of Beirut, Lebanon
O. Abdelkader, American University of Beirut, Lebanon
Youssef Mouneimne, American University of Beirut, Lebanon
Kamal Bou Hadir, American University of Beirut, Lebanon
I. Saoud, American University of Beirut, Lebanon
I. Tzovenis, EEXI, Greece
Youssef Abou Jawdah, American University of Beirut, Lebanon
16:30 – 16:50 **Application of Waste Heat Recovery Concepts to Generators: Thermal Modeling and Analysis**
Mahmoud Khaled, *Lebanese International University, Lebanon*
Mohamad Ramadan, *Lebanese International University, Lebanon*
Mostafa Gad El Rab, *Lebanese International University, Lebanon*

16:50 – 17:10 **Investigating Waste to Energy Potential in the Eastern Region of Saudi Arabia**
Omer Aga, *University of Dammam, Saudi Arabia*
Omar K. M. Ouda, *Prince Mohamed Bin Fahd Univ., Saudi Arabia*
Syed Ahmed Raza Naqvi, *University of Western Ontario, Canada*

17:10 – 17:30 **Solid Waste to Energy Strategy in Lebanon: Potential, Technology and Design**
Ali Hammoud, *Lebanese University, Lebanon*
Mahamad Kassem, *Lebanese University, Lebanon*
Adel Mourtada, *ALMEE, Lebanon*

19:30 – 23:00 **Gala dinner**
Thursday, November 27, 2014

08:30 – 09:15  Registration

09:15 – 10:00  Plenary session

   Anne-Marie Giroux
   Hydro-Quebec Research Institute, Canada
   Renewable energy from large hydro-generating units at Hydro-Quebec: An overview of research activities and latest developments

10:00 – 10:30  Coffee break

10:30 – 12:30  Oral sessions

Session 5:  Wind Generation Systems and Smart Grids

Room:  A

Session Chairs:  Semaan Georges, Notre-Dame University, Lebanon
                Imad Mougharbel, Lebanese University, Lebanon

10:30 – 10:50  Effect on GPR of Earthing Connection between Wind Turbines
   Sokratis Pastromas, University of Patras, Greece
   Charalambos Nikolakopoulos, University of Patras, Greece
   Georgios Peppas, University of Patras, Greece
   Ioannis Naxakis, University of Patras, Greece
   Eleftheria Pyrgioti, University of Patras, Greece

10:50 – 11:10  Frequency Regulation Based on a Coordinator Unit in an Isolated Wind Power Network
   Seyedehnafiseh Mirniahari-kandehi, Semnan University, Iran

11:10 – 11:30  Sensor-less MPPT for PMSG Micro Wind Turbines based State-Flow
   Rana Ahmed, Aix-Marseille University, France

11:30 – 11:50  Pilot buses selection used in secondary voltage control
   Nivine Abou Daher, UL & USJ, Lebanon
   Imad Mougharbel, Lebanese University, Lebanon
   Maarouf Saad, Ecole de Technologie Supérieure, Canada
   Hadi Y. Kanaan, Saint-Joseph University, Lebanon

11:50 – 12:10  Lebanon's qualifications to upgrade for a Smarter Grid
   Nabil Abdel Karim, Lebanese International University, Lebanon
   Khaled A. Chahine, Lebanese International University, Lebanon
   Omar K. Al Kaaki, LIU & KVA sal, Lebanon
Session 6: Solar and Thermal Energy

Room: B

Session Chairs: Khalil Khoury, Lebanese University, Lebanon
Elias Kinab, Lebanese University, Lebanon

10:30 – 10:50 Recovering Heat from Shower Water – Design Calculation and Prototype
Mohamad Ramadan, Lebanese International University, Lebanon
Mahmoud Khaled, Lebanese International University, Lebanon

10:50 – 11:10 Optimized Heater Control for Low Current Consumption
Nabil Karami, LSIS & Aix-Marseille University, Lebanon
Nazih Moubayed, Lebanese University, Lebanon

11:10 – 11:30 Comparison between PV Farm, Solar Chimney and CSP Tower in Lebanon – Economic Study for a 100 MW Power Plant
Claude Bayeh, EEE Group, Lebanon
Nazih Moubayed, Lebanese University, Lebanon

11:30 – 11:50 Thermodynamic Analysis of Power Generation from Solar Chimney
Mostafa Gad El Rab, Lebanese International University, Lebanon
Mohamad Ramadan, Lebanese International University, Lebanon
Mahmoud Khaled, Lebanese International University, Lebanon

11:50 – 12:10 Performance Evaluation of a Solar Ejector-Vapor Compression Cycle for Cooling Application
Karima Megdouli, ENIM, Tunisia

12:10 – 12:30 Comparison between PV Farm, Solar Chimney and CSP Tower in Lebanon - Influence of Temperature and Solar Irradiance on the Output Power
Claude Bayeh, EEE Group, Lebanon
Nazih Moubayed, Lebanese University, Lebanon

12:30 – 14:00 Lunch

14:00 – 14:30 Keynote session
Simon Abourida
Opal-RT Technologies, Canada
The Use of Real-Time Simulation in the Design of Renewable Energy Systems

14:30 – 14:40 Break

14:40 – 16:40 Oral sessions
Session 7: Power Converters and Energy Management

Room: A

Session Chairs: Hadi Y. Kanaan, Saint-Joseph University, Lebanon
Mazen Ghandour, Lebanese University, Lebanon

14:40 – 15:00 A Comparative Study of Three Switching Patterns Used in SV-PWM Control of a Matrix Converter
Chantal Chemaly, Saint-Joseph University, Lebanon
Carine Rouhana, Saint-Joseph University, Lebanon
Catherine Nasr El-Khoury, Saint-Joseph University, Lebanon
Hadi Y. Kanaan, Saint-Joseph University, Lebanon

15:00 – 15:20 A Flying-Capacitor-Based Multilevel Shunt Active Power Filter for Power Quality Improvement under Severe Operating Conditions
Antoine Hanna Nohra, CNAM, Lebanon
Hadi Y. Kanaan, Saint-Joseph University
Maurice Fadel, Laplace-ENSEEIHT, France

15:20 – 15:40 Sliding-Mode Current Control Design for a Grid-Connected Three-Level NPC Inverter
Fadia Sebaaly, Saint-Joseph University, Lebanon
Hani Vahedi, Ecole de Technologie Supérieure, Canada
Hadi Y. Kanaan, Saint-Joseph University, Lebanon
Nazih Moubayed, Lebanese University, Lebanon
Kamal Al-Haddad, Ecole de Technologie Supérieure, Canada

15:40 – 16:00 Hardware in the Loop Simulation for Optimal Management of Electrical Power Converters
Marc Anthony Mannah, Lebanese International University, Lebanon
Ahmad Haddad, Lebanese International University, Lebanon
Hassan Bazzi, Lebanese International University, Lebanon

16:00 – 16:20 Smart Home Energy Management Systems Survey
Motaz Amer, Aix-Marseille University, France

George El-Jamal, Saint-Joseph University, Lebanon
Hussein Ibrahim, Wind Energy TechnoCentre, Canada
Mazen Ghandour, Lebanese University, Lebanon
Session 8: Green Buildings and Energy Efficiency

Room: B

Session Chairs: Talal Salem, Notre-Dame University, Lebanon
Adnan Jouni, ALMEE, Lebanon

14:40 – 15:00 For Better Energy Consumption and Management in Future Cellular Networks
Michel Nahas, Lebanese International University, Lebanon
Milad Ghantous, Lebanese International University, Lebanon
Khaled Al Haj Ismaiil, Lebanese International University, Lebanon
Bachir Assaf, Lebanese International University, Lebanon

15:00 – 15:20 Detailed Thermal Transfer through an Innovative Wall Section
Emilio Sassine, Green Future Holding, Lebanon

Adel Mourtada, Lebanese University, Lebanon
Adnan Jouni, ALMEE, Lebanon
Rayan Mourtada, Ecotech Engineering, Lebanon

15:40 – 16:00 Structural Analysis of a New Building Technology in Lebanon Made of Wood Structure
Emilio Sassine, Green Future Holding, Lebanon
Charbel Koussaify, Ecole Centrale de Nantes & COWOB, France
Bernard Ammoun, COWOB & Green Future Holding, Lebanon

16:00 – 16:20 The Use of Phase Change Material in the Design of Heat Recovery and Energy Storage System
Wassim Salameh, Lebanese International University, Lebanon
Ibrahim Elabed, Lebanese International University, Lebanon
Zaheer Kaddoura, Lebanese International University, Lebanon
Ali. H. Assi, Lebanese International University, Lebanon
Mostafa Gad El Rab, Lebanese International University, Lebanon
Mohamad Hammoud, Lebanese International University, Lebanon

16:20 – 16:40 Hotel Renovation - from Grey to Green: A Case Study Validating a Proposed Guide for Sustainable Hotel Renovation
Wissam Khoury, Notre-Dame University, Lebanon
Talal Salem, Notre-Dame University, Lebanon
Taline Zgheib, Notre-Dame University, Lebanon
Session 9: Photovoltaic Systems

Room: C

Session Chairs: Tilda Akiki, USEK, Lebanon
Ali Assi, Lebanese International University, Lebanon

14:40 – 15:00 Roadmap for the Promotion of PV Electricity in Lebanon
Adel Mourtada, ALMEE, Lebanon
Adnan Jouni, ALMEE, Lebanon

15:00 – 15:20 A Geometric Approach for PV Modules Degradation
Bechara Nehme, USEK, Lebanon
Nacer K. M’Sirdi, LSIS, France
Tilda Akiki, USEK, Lebanon

15:20 – 15:40 Using Double-Layer Thin Film Coating on Glass for Increased Transmission for Solar Cell
Mohamad Habli, Lebanese International University, Lebanon
Zahraa Bou Hamad, Lebanese International University, Lebanon
Mohammad Haidar, Lebanese International University, Lebanon

15:40 – 16:00 BIPV Building Integrated Photovoltaic Systems in Mediterranean Climate
Elias Kinab, Lebanese University, Lebanon
Talal Salem, Notre-Dame University, Lebanon
Ghimar Merhy, Saint-Joseph University, Lebanon

16:00 – 16:20 Paving the Way towards Micro-grids: PV-Based Micro-grids to Replace Diesel Generators in Lebanon
Nour Ezzeddine, Lebanese International University, Lebanon
Samer Mansour, Lebanese International University, Lebanon
Ali H. Assi, Lebanese International University, Lebanon

16:20 – 16:40 Dimensioning a Residential PV System for a Cost Minimization when Operating under Abnormal Situations: Case Study for Lebanon
Fady Melhem, UL & USJ, Lebanon
Imad Mougharbel, Lebanese University, Lebanon

16:40 – 17:00 Closing session
## List of Reviewers

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<th>Affiliation</th>
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Institute of Electrical and Electronics Engineers (IEEE)

About IEEE

IEEE, an association dedicated to advancing innovation and technological excellence for the benefit of humanity, is the world’s largest technical professional society. It is designed to serve professionals involved in all aspects of the electrical, electronic and computing fields and related areas of science and technology that underlie modern civilization.

IEEE’s roots, however, go back to 1884 when electricity was just beginning to become a major force in society. There was one major established electrical industry, the telegraph, which—beginning in the 1840s—had come to connect the world with a communications system faster than the speed of transportation. A second major area had only barely gotten underway—electric power and light, originating in Thomas Edison’s inventions and his pioneering Pearl Street Station in New York.

IEEE, pronounced "Eye-triple-E", stands for the Institute of Electrical and Electronics Engineers. The association is chartered under this name and it is the full legal name.

However, as the world’s largest technical professional association, IEEE’s membership has long been composed of engineers, scientists, and allied professionals. These include computer scientists, software developers, information technology professionals, physicists, medical doctors, and many others in addition to our electrical and electronics engineering core. For this reason the organization no longer goes by the full name, except on legal business documents, and is referred to simply as IEEE.

Corporate Identity and Strategy

IEEE creates an environment where members collaborate on world-changing technologies – from computing and sustainable energy systems, to aerospace, communications, robotics, healthcare, and more. The strategic plan of IEEE is driven by an envisioned future that realizes the full potential of the role IEEE plays in advancing technology for humanity.

Governance

IEEE is led by a diverse body of elected and appointed volunteer members. The governance structure includes boards for operational areas as well as bodies representing members in the 45 Societies and technical Councils and ten worldwide geographic regions.

Membership & Services

The key values of IEEE membership are technical innovation, access to cutting-edge information, networking opportunities, and exclusive member benefits.

IEEE memberships support IEEE's mission to advance technology for humanity and the profession. At the same time, memberships build a platform to introduce technology careers to students around the world.

Education & Careers

IEEE offers a wide range of learning, career enhancement, and employment opportunities within the engineering sciences, research, and other technology areas.

The goal of these programs is to ensure the growth of skill and knowledge among professionals and to foster individual commitment to continuing education among IEEE members, the engineering and scientific community, and the general public.
ESCWA in Brief

Stability and prosperity are the watchwords of the United Nations Charter. They are prerequisites for sound and cordial relations between nations, based on respect for the principle of equal rights that ensures and provides equality self-determination of opportunity to pursue a higher standard of living and employment for all through consistent economic growth and social development.

The five regional commissions were created by the United Nations in order to fulfill the economic and social goals set out in the United Nations Charter by promoting cooperation and integration between the countries in each region of the world. Those commissions are: the Economic Commission for Europe (ECE, established in 1947); the Economic and Social Commission for Asia and the Pacific (ESCAP, 1947); the Economic Commission for Latin America and the Caribbean (ECLAC, 1948); the Economic Commission for Africa (ECA, 1958); and the Economic and Social Commission for Western Asia (ESCWA, 1973).

ESCWA

The Economic Commission for Western Asia (ECWA) was established on 9 August 1973 pursuant to the Economic and Social Council’s resolution 1818 (LV). The purpose of setting up the Commission was to raise the level of economic activity in member countries and strengthen cooperation among them. It was also intended to meet the need of the countries in Western Asia for the services of a regional economic commission to promote the development efforts in the region.

In recognition of the social component of its work, the Commission was entrusted with new responsibilities in the social field by virtue of Economic and Social Council resolution 69/ 1985 of July 1985. Its name therefore became the Economic and Social Commission for Western Asia (ESCWA).

ESCWA has been located in a number of Arab capitals. It started in Beirut (1974-1982), moved to Baghdad (1982-1991), then to Amman (1991-1997), and returned to Beirut in 1997, its permanent headquarters.

Membership

ESCWA comprises 17 Arab countries in Western Asia: Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, The Sudan, The Syrian Arab Republic, Tunisia, The United Arab Emirates and Yemen.

Objectives

- To support economic and social development in the countries of the region.
- To promote cooperation between the countries of the region.
- To encourage interaction between member countries and promote the exchange of experience, best practice and lessons learned.
- To achieve regional integration between member countries, and to ensure interaction between Western Asia and other regions of the world.
- To familiarize the outside world with the circumstances and needs of the countries in the region.

Mission

ESCWA provides a framework for the formulation and harmonization of sectorial policies for member countries, a platform for congress and coordination, a home for expertise and knowledge, and an information observatory. ESCWA activities are coordinated with the divisions and main offices of the Headquarters of the United Nations, specialized agencies, and international and regional organizations, including the League of Arab States and its subsidiary bodies, and the Gulf Cooperation Council.
Association Libanaise pour la Maîtrise
de l’Energie et pour l’Environnement (ALMEE)

The Lebanese Association for Energy Saving and for Environment is involved in a wide range of activities related to sustainable practices and other “green” issues. Known by its French-language acronym, ALMEE (Association Libanaise pour la Maitrise de l’Energie et pour l’Environnement), the group describes itself as “a non-political & non-profit association” committed to better handling of multiple issues and technologies associated with Energy and Environment, not just in Lebanon but also across the Mediterranean Basin and worldwide.

Specifically, ALMEE’s overriding goal is to develop, increase and promote scientific methods and means contributing to better management of energy and related economic policies, including the following:

- Renewable energy sources like solar, wind, biomass, hydraulic, wood, etc.;
- Technical issues designed to improve energy efficiency, such as insulation, glazing, and the latest heating and air-conditioning technologies;
- Techniques like cogeneration that lessen the waste associated with power generation and industrial processes.

For more than 2 decades, ALMEE has pursued a philosophy of sustainable and harmonious development for Lebanon and the region, gaining a wealth of experience from cooperation with some of the world’s leading organizations.

In short, ALMEE has worked with local, regional and international partners – from governments and multilateral institutions of civil society and the private sector – to buttress calls for more sustainable policies and practices related to energy and environment. ALMEE’s main goal is building awareness and support for better management – and to keep the business community apprised of the tremendous growth potential exhibited by this new and exciting sector.

As the public becomes more and more concerned about environmental issues, the marketplace continues to reflect changing attitudes, opening up significant opportunities for forward-thinking companies to increase sales and revenues and be good corporate citizens at the same time. ALMEE constitutes an excellent venue to communicate these and other possibilities tied to the use of renewable energy and other means of better and more sustainable environmental practices.

ALMEE worked on developing proposed mechanisms for greenhouse gases emissions in several projects.
Sponsors:

- Order of Engineers and Architects in Beirut (OEA)
- Institute of Electrical and Electronics Engineers (IEEE)
- Lebanese Association for Energy Saving and for Environment (ALMEE)
- IEEE Lebanon Section
- ESCWA

Co-Sponsors:

- IEEE Industrial Electronics Society (IES)
- Ecole de Technologie Supérieure (ETS)
- Lebanese University
- Saint-Joseph University (USJ)
- Notre-Dame University (NDU)
- Holy-Spirit University in Kaslik (USEK)
- IEEE Lebanon CAS/PE/PEL Joint Chapter
- Université Libano-Française (ULF)
- American University of Beirut (aub)
- Institut Méditerranéen des Énergies Renouvelables (IMEDER)
- Association Méditerranéenne des Agences de Maîtrise de l’Énergie (MEDENER)
- Water Energy Environment Research Center
- Agence de l’Environnement et de la Maîtrise de l’Énergie (ADEME)