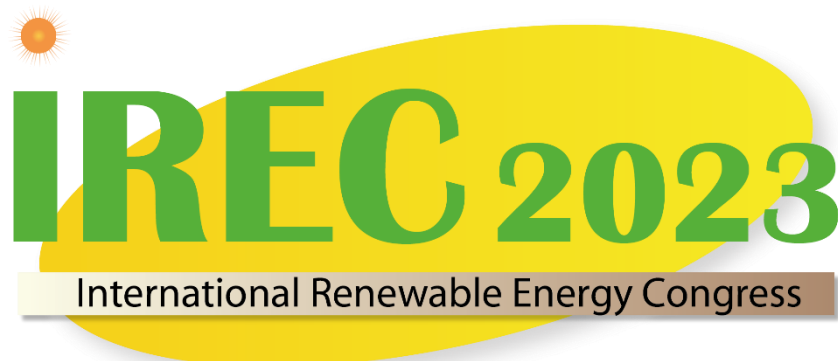


The 14th International Renewable Energy Congress

December 16 - 18, 2023 – Sousse, Tunisia



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The International Renewable Energy Congress (IREC) provides a forum for researchers, academicians, scientists, and industrial professionals around the world on recent developments in the fields of renewable energy. The congress consists of keynotes, oral sessions, and poster presentations. Considered as a catalyst for research works, the IREC publishes the best presented papers in partner journals.

The proceedings include works of authors from academia as well as industry working within the scope of the congress subjects. Submissions have been peer reviewed by our International Program Committee based on full manuscripts. Acceptance have been based on quality, originality and relevance. Contributions were checked to be original and neither published elsewhere nor submitted for publication during the review period.

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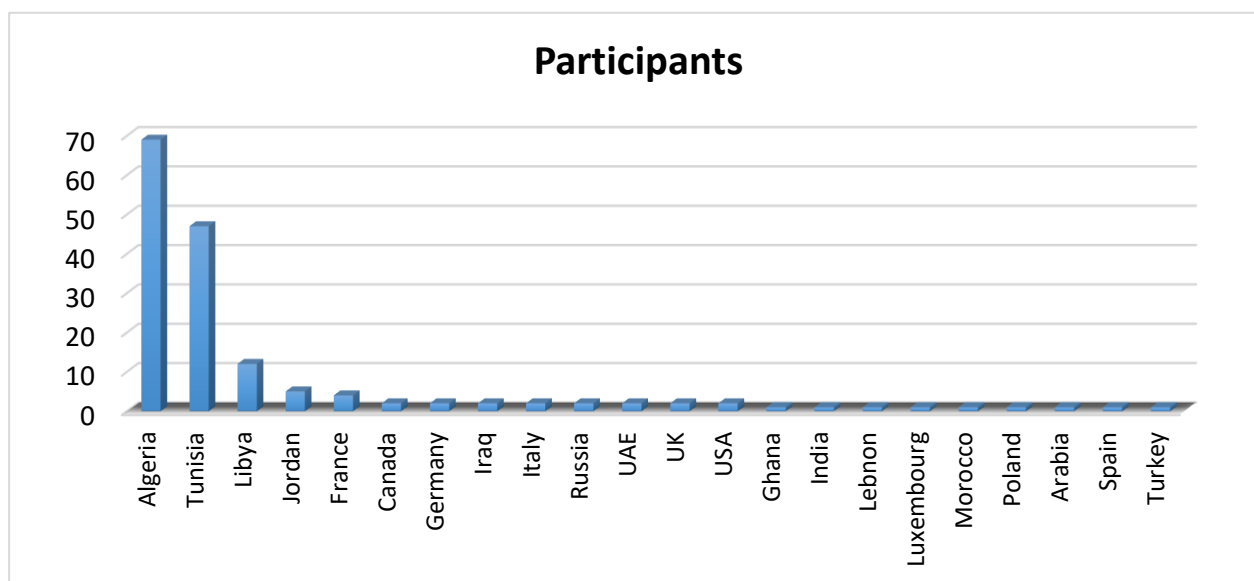
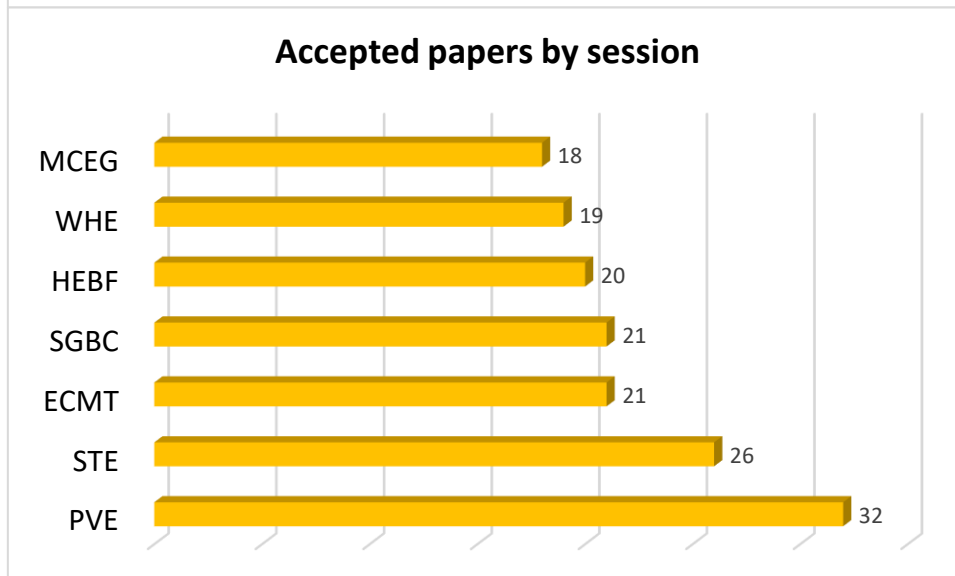
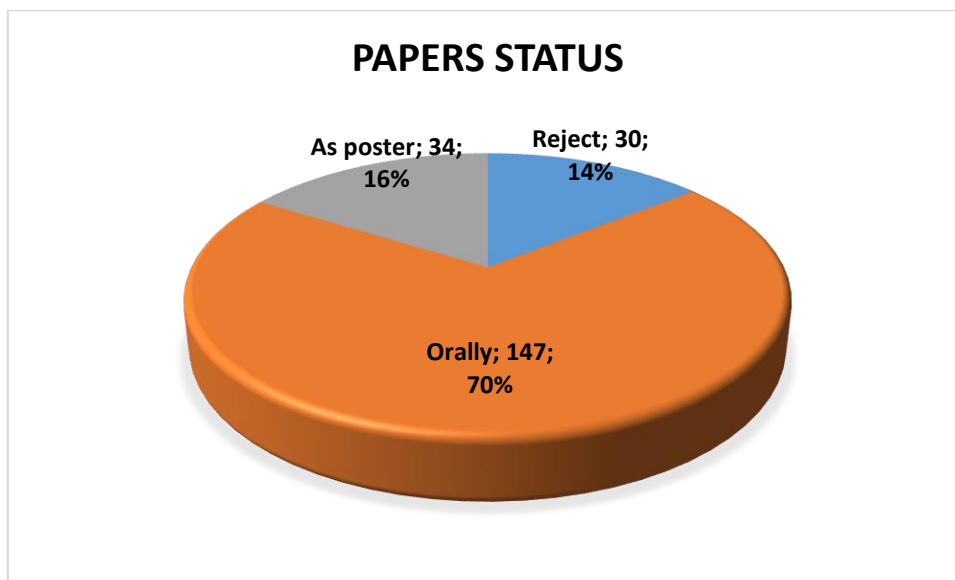
Publications in partner journals

Suitable papers will be selected by the Associated Editors based on their fitting to each journal topics.

Authors of the selected papers will be invited just after the conference to revise extensively the manuscripts according to the following:

1. At least 50% should be added in fundamentals, material, validation, etc.
2. The title, the abstract and the conclusion should be changed.
3. The references should be updated (to add at least 30% to introduction).
4. The discussion of results should be updated.
5. The manuscript should be formatted according to the journal guidelines.
6. The revised paper should be submitted at the journal link before the deadline in the invitation email.

The revised paper will then go through a full review process according to the journal review process.



KEYNOTE 1

Saturday, December 16, 2023

(09:00 - 10:00) / Room 1

Role of the Smart Grid and Microgrid in Decarbonization

Saifur Rahman, PhD

Joseph Loring Professor & Director
Advanced Research Institute
Virginia Tech, USA

2023 IEEE President & CEO

Chairman: Pr. Ahmad Harb (Jordan)

Abstract

With the focus on environmental sustainability and energy security, power system planners are looking at renewable energy as agents of decarbonization to help with climate sustainability. But such generation sources have their own challenges - primarily intermittency. It is expected that the smart grid – due to its inherent communication, sensing and control capabilities – will have the ability to manage the load, storage and generation assets (including renewables) in the power grid to enable a large-scale integration of distributed generation. In a smart grid, information about the state of the grid and its components can be exchanged quickly over long distances and complex networks. It will therefore be possible to have the integration of sustainable energy sources, such as wind, solar, off-shore electricity, etc. for smoother system operation. But, in order to build smart grids engineers will need to start with intelligent microgrids as building blocks. This lecture introduces the operational characteristics of renewable energy sources, storage devices, and various aspects of the smart grid. It also addresses the interplay among distributed generation, storage and conventional generation to provide an efficient operational strategy in the context of the smart grid.

Biography



Professor Saifur Rahman is the founding director of the Advanced Research Institute at Virginia Tech, USA where he is the Joseph R. Loring professor of electrical and computer engineering. He also directs the Center for Energy and the Global Environment. He is a Life Fellow of the IEEE and an IEEE Millennium Medal winner. He is the 2023 IEEE President and CEO and was the president of the IEEE Power and Energy Society (PES) for 2018 and 2019. He is the founding editor-in-chief of the IEEE Electrification Magazine and the IEEE Transactions on Sustainable Energy. He has published over 150 journal papers and has made over five hundred conference and invited presentations. He is the founder of BEM Controls, LLC, a Virginia (USA)-based software company providing building energy management solutions. He has conducted several energy efficiency,

renewable energy, blockchain and sensor integration projects for Duke Energy, Tokyo Electric Power Company, the US National Science Foundation, the US Department of Defense, the US Department of Energy and the State of Virginia. He has a PhD in electrical engineering from Virginia Tech.

KEYNOTE 2

Sunday, December 17, 2023

(09:00 - 10:00) / Room 1

The Future of Wind Energy in the Energy Transition

Pr. James F. Manwell

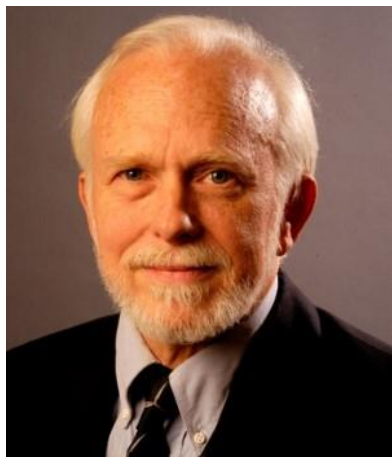
Director of the Renewable Energy Research Laboratory (RERL)
University of Massachusetts Amherst , USA

Chairman: Pr. Mohamed Kesraoui (Algeria)

Abstract

Wind energy has undergone a remarkable evolution over the last half century. The wind turbines of the 1970s were relatively small, simple machines of marginal reliability. Turbines today are far larger, more sophisticated, and more reliable. Now, the wind is expected to supply a large fraction of the world's energy supply in the transition away from fossil fuels. In order to accomplish this, however, there is still much to be done. The focus will shift from wind turbines per se to wind energy systems in which the turbines are an important, but not the only components. Turbines will be active, and in some cases primary, participants in larger power systems. Groups of turbines will form wind power plants whose combined output will be comparable to the largest conventional power plants of the present time. These wind power plants will operate together with energy storage, power electronics, integrative control systems and hydrogen based fuel production (power-to-X) in ways that were heretofore almost inconceivable. This presentation will provide an overview of the ongoing and emerging developments in wind energy science and technology that will enable the wind power systems of the future: atmospheric science, materials, turbine design, wind power plant control and power-to-X.

Biography



James F. Manwell is a Professor of Mechanical Engineering at the University of Massachusetts Amherst and the Founding Director of the University's Wind Energy Center. Prof. Manwell has been working in the field on wind energy for more than 35 years, both within the United States and internationally. His research interests have focused on wind turbine external design conditions, hybrid power systems, energy storage and offshore wind energy. He worked with the International Energy Agency's wind energy program on autonomous wind energy systems and is a member of International Electrotechnical Commission's working groups developing design standards for offshore wind turbines. He is the lead author of the text book *Wind Energy Explained: Theory, Design, and Application* as well as numerous other publications on various aspects of wind energy

KEYNOTE 3

Monday, December 18, 2023

(09:00 - 10:00) / Room 1

Low-cost Renewable Hydrogen using Anion Exchange Membrane Water Electrolysis

Pr. Steven Holdcroft

Department of Chemistry, Simon Fraser University
Burnaby, V5A 1S6, Canada

Chairman: Pr. Abdeslam-Hassen Meniai (Algeria)

Abstract

An inexpensive, environmentally friendly energy carrier must be employed to allow for the decarbonization of domestic heating, transportation, and many industrial processes. Hydrogen is widely regarded as being this primary energy carrier. Global demand of H₂ is ~70 Mt H₂ with just 2% produced by electrolysis. Many net zero CO₂ emission strategies suggest hydrogen demand could increase ten-fold by 2050 – there is a need for increased green hydrogen production. The electrolysis of water has the biggest potential for scalability and widespread adoption, of which three electrolytic types are of various levels of maturity: alkaline water electrolysis (AWE), proton exchange membrane water electrolysis (PEM-WE), and anion exchange membrane water electrolysis (AEM-WE). AEM-WE which has emerged as a promising competitor for green hydrogen production at scale, as it combines the known benefits of using inexpensive non-noble metal catalysis in alkaline media with the reduced ohmic losses of cells incorporating an ultrathin polymeric membrane. This presentation will report on latest advances towards achieving low-cost renewable hydrogen and address inherent challenges of AEM-WE technology that are rapidly being overcome.

Biography



Dr. Steven Holdcroft is a Professor of Chemistry and Canada Research Chair, and former President of the Canadian Society for Chemistry. He researches materials for electrochemical energy conversion & storage. He is author of 300 peer-reviewed articles and 20+ patents. He was a board of director of the Canadian Fuel Cell and Hydrogen Association for more than 10 years. He serves on the Editorial Advisory Board of the journals Chemistry of Materials (ACS) and Energy and Environmental Science (RSC). With three former students, he cofounded Vancouver-based Ionomr Innovations Inc., a thriving 50+ person SFU spin-out commercializing materials for clean energy. Dr. Holdcroft has received numerous awards for research and service. In 2021, he was elected to the fellowship of the Royal Society of Canada, and in 2023 received a Gutenberg prize award from the Cercle Gutenberg (France).

IREC 2023 SCHEDULE

	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
Friday December 15th , 2023								Registration				
Saturday December 16th, 2023	Welcome and Opening	Keynote 1	Slot 1 4 rooms			Lunch		Slot 2 4 rooms				
Sunday December 17th , 2023		Keynote 2	Slot 3 4 rooms			Lunch		Social program Excursion to Kairouan				
Monday December 18th , 2023		Keynote 3	Slot 4 4 rooms			Closing	Lunch		WISH YOU ALL SAFE AND NICE TRIP BACK HOME			

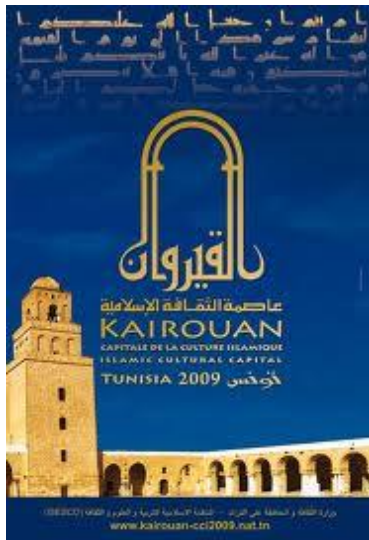
SESSIONS

- **ECMT:** Energy Conversion, Management and Transmission
- **HEBF:** Hydrogen Energy and BioFuels
- **MCEG:** Materials For Clean Energy Generation
- **SGBC:** Smart-Grids, Zero Energy Buildings and Sustainable Cities
- **PVE:** Photovoltaic Energy
- **STE:** Solar Thermal Energy
- **WHE:** Wind and Hybrid Energies

Excursion to Kairouan: (20 Euros/ 70 DT)

Departure: Sunday 17th, at 2:30 pm

Social Program 1: Excursion to Kairouan city; Tunisia's Islamic heritage



Kairouan is referred to as the Islamic Cultural Capital. The city was founded by the Arabs around 670. In the period of Caliph Mu'awiya, it became an important centre for Islamic and Quranic learning, and thus attracting a large number of Muslims from all over of the world, next only to Mecca and Medina. The holy Mosque of Uqba is situated in the city. It is considered as Islam's fourth holiest city.



DISPATCHING OF PRESENTATIONS

ID	Room 1							Room 2					Room 3					Room 4					
Slot 1	Poster : HEBF MCEG							Oral : STE					Oral : SGBC					Oral : ECMT					
	31	41	61	91	134	146	148	157	27	44	54	56	84	96	98	119	122	125	108	113	114	124	126
	221	229	42	86	109	165	196	197	100	103	182	105		144	154	162	167	97	129	139	166	193	253
	199	213	231	241	254	206	218																
Slot 2	Poster : STE WHE							Oral : PVE					Oral : MCEG					Oral : ECMT					
	46	47	52	121	140	153	183	195	29	43	48	51	60	30	90	142	171	180	3	18	19	23	35
	34	73	151	205	141				234	99	112	115	123	239	247	248			45	85	93	95	107
Slot 3	Poster : ECMT							Oral : PVE					Oral : WHE					Oral : STE					
	188	2	39	63	69	72	75	130	131	135	201	225	233	25	26	53	55	68	106	133	156	184	187
	163	170	204	232	250				62	236	237	238	78	77	127	168	220		207	216	224	249	252
Slot 4	Poster : PVE							Oral : HEBF					Oral : SGBC					Oral : ECMT					
	32	33	50	70	87	150	169	172	101	102	132	137	138	4	20	21	36	57	116	200	208	210	214
	173	186	235						145	149	223	243	190	66	71	76	81	179	215	217	219	244	246

ECMT : Energy Conversion, Management and Transmission

Slot 1 : December 16th , 10:00 AM - 12:30 PM

Room 4

Chairs:

Ahmad Harb , Jordan
Karima Megdouli , France

Order	ID	Paper
1	108	Active and Reactive Power Limits of Grid-Connected Converters Ahmad Ammar NAASSANI, Mohamed Wissem NAOUAR, Ahmad Diea SUKARY, Eric MONMASSON
2	113	The impact of institutional quality and environmental tax on the energy transition Amal BEN KHALED, Rami BEN HAJ KACEM, Nathalie LAZARIC
3	114	Analysis of Feasible Solutions for the Improvement of Voltage Profile in Alkufra Network Containing PV Generation Unit Salahuddin I. Abdrabba, Aiman Nouh, Saad T.Y. Alfalahi, Faisal Mohamed
4	124	Enhanced NARX Neural Network Model for Specific Time-Series Prediction. Case Study: Battery State of Charge in Electric Vehicles Marwa Ben Saïd-Romdhane, Zina Boussaada, Octavian Curea, Sondes Skander-Mustapha
5	126	Investigation of the Modes of the Electric Network Operating on the Energy Internet Principle Elena Sosnina, Rustam Bedretdinov, Evgeny Kryukov, Daniil Gusev
6	129	Performance Analysis of GRU, LSTM and Feedforward Neural Networks for the State of Charge Estimation of a Lithium-Ion Battery for e-Bike Applications Mariem Loussif, Sejir Khojet El Khil, Lotfi charaabi, Sofiane Sayahi
7	139	Modeling of a Three-Phase Diode Bridge Rectifier Connected to a Three-Phase AC Source via an Inductive Filter Ahmad Ammar NAASSANI, Mohamed Wissem NAOUAR, Manel JEBALI BEN GHORBAL
8	166	Thermal behaviour of an Organic Phase Change material at microscale for the manufacturing of a non-leakage composite C. Coin, P. Legros, S. Ben-Ali, F. Achchaq

Order	ID	Paper
9	193	Micro scale modeling of heat transfer and entropy generation in a porous channel using Lattice Boltzmann method and design of experiments Mokhtar Ferhi, Dorra Khilifi, Ridha Djebali
10	253	Machine Learning-based Wind Speed Prediction: A Study on Gradient Boosting Regressor Algorithm Nabiha BRAHMI, Leila HAJ MEFTAH, Maher CHAABENE

Slot 2 : December 16th , 03:00 PM - 05:30 PM

Room 4

Chairs:

Mohamed wissem Naouar , Tunisia

Order	ID	Paper
1	3	Simulation and Optimization of a Microgrid Energy Management System Abdelmadjid Recioui, Fatma Zohra Dekhandji
2	18	Reactive power control using STATCOM device in weak power transmission system Mohammed K. Almamoori, Mohamed A. Almaktar
3	19	Dynamic and Operational Characteristics of Three-Phase Induction Motor Powered by Lead-Acid Battery Driving Centrifugal Pump Mohammad Widyan, Ghassan Marji, Ahmad Harb
4	23	Efficient Design for PMSM Control and Real-Time Diagnosis based on FreeRTOS for e-bike application Mariem Loussif, Maissa Ayari, Lotfi charaabi, Sejir Khojet El Khil, Sofiane Sayahi
5	35	Comparative Analysis of Droop Control Techniques for Voltage Stability in DC Microgrids Mehdi Allagui, Mohamed Abbas
6	45	Improved approach for online monitoring of second-life lithium-ion batteries to optimize their performance in stationary battery storage systems Mussab Najeeb, Ulf Schwalbe, Mathias Herget
7	85	Probing based Real time Inertia Estimation Tool Xinlan Jia, Zhihao Jiang, He Yin, Yi Zhao, Yilu Liu, Jin Tan, Andy Hoke, Jiangkai Peng, Przemyslaw Koralewicz, Emanuel Mendiola, Ezequiel Hernandez, Juan Bellido, Kelsey Horowitz, Aaron Madtson, Brad Rockwell, Cameron Kruse

Order	ID	Paper
8	93	Co-simulation Framework OpenDSS-Python to Consider Distribution Grid Constraints in a Transactive Energy System Daniel Camilo Galeano Suarez, Juan Carlos Oviedo Cepeda, Nilson Henao, Kodjo Agbossou, David Toquica, Michaël Fournier
9	95	Study of the Simulated power Flow in a Single-Phase Standalone PV/Battery System supplying Residential Loads Sameh Romdhani, Monia Ben Khader Bouzid, Rafik Absi
10	107	New anti-crystallization design for solar absorption refrigeration system operating with the R718/LiBr mixture Haifa ARFAOUI, Nizar BEN EZZINE, Salwa BOUADILA, Mariem LAZAAR

Slot 3 : December 17th , 10:00 AM - 12:30 PM

Room 1

Chairs:

Deneche salima Lekhchine , Algeria
Faisal Mohamed , Libya

Order	ID	Paper
	188	Experimental study of the effect of the arrangement of micro-pillars on the lifetime of Total oil droplet in the Wenzel-like regime D.Khilifi, M.Ferhi, R.Djebali, and S.Harmand
	2	An Overview of the Role of Solid State Transformer in Extreme Fast Charging of Electric Vehicles Nasiru B. Kadandani, Sahalu Hassan, Abdullah Al-khalidi
	39	Optimal Energy Management of Standalone Hybrid PV/Wind/Battery System Based On Pattern Search Algorithm: A case study in Skikda, Algeria Rochdi Bouchebbar, Mabrouk Atrouche, Nouredine Bouaziz
	63	Design and Performance Evaluation of a Pumped Hydro Storage Power Plant at an Academic Campus Working on the Principle of Pumps as Turbines (PAT) Yara Haddad, Ibrahim Rahoma
	69	Evaluation of Bovine Carbonic Anhydrase for Promoting CO2 Capture via Reaction with KOH and High-Salinity Reject Brine Aya Mourad, Ameera Mohammad, Ali Al Marzouqi

Order	ID	Paper
	72	GEOMETRY OPTIMIZATION OF AN EJECTOR BASED ON THE TWO-DIMENSIONAL DISTRIBUTION MODEL FOR SUPERMARKET APPLICATION IN WARM CLIMATES Karima Megdouli
	75	A machine learning approach for hydroelectric power forecasting Sarah Di Grande, Mariaelena Berlotti, Salvatore Cavalieri, Roberto Gueli
	130	Influence of magnetic field on the laminar forced convection of hybrid nanoliquid in a channel Mohamed Ammar Abbassi, Rached Miri
	163	Investigation of synthetic jets cooling efficiency# Ridha DJEBALI, Mokhtar FERHI Ridha Djebali, D. Khilifi, and M. Ferhi
	170	Online Energy Supervision Inside Industrial Companies: Towards R&D Kamel Mkaouar, Maher Chaabene
	204	Computational and DOE Assessment of thermodynamic second law in closed medium with internal fan Ridha Djebali, M. Ferhi, and D. Khilifi
	232	Tracking Controller Design for a Small Scale Unmanned Helicopter kared saber, Mechhoud elarkam, ahmida zahir
	250	State and fault estimation for discrete-time descriptor T-S systems with input saturation Nadjet Bououden, Ines Righi, Sabrina Aouaouda, Fayçal Bourahala

Slot 4 : December 18th , 10:00 AM - 12:30 PM

Room 4

Chairs:

Abbes Mohamed , Tunisia

Order	ID	Paper
1	200	Simulation of transpiration cooling with phase change using OpenFOAM Aroua Ghedira, Zied Lataoui, Adel M. Benselama, Yves Bertin, AbdelMajid Jemni
2	208	Enhancing Stirling Engine Efficiency through Multi Sub-Regenerator Design: a Numerical Investigation using MVCEF Method Ines Marzougui, Houda Hachem, Ramla Gheith, Fethi Aloui

Order	ID	Paper
3	210	Study of an internal combustion engine fueled partially with green hydrogen via the recovery of its exhaust gases Zakaria Solaani, Ramla gheith, Fethi Aloui
4	214	Modeling of the exhaust gas-pressurized nitrogen exchanger equipped with a Stirling engine as a cogeneration device HOUDA HACHEM, Ramla GHEITH, Fethi ALOUI
5	215	Enhancement of heat transfer using nanofluids in High-efficiency vortex (HEV) multifunctional heat exchanger Insaf MEHREZ, Houda HACHEM, Ramla GHEITH, Fethi ALOUI
6	217	Heat transfer and irreversibility response due to MHD natural convection in a micro tall porous cavity: micro-electronic cooling application Mokhtar Ferhi, Dorra Khilifi, Ridha Djebali
7	219	Numerical analysis of coupled pore-scale heat and mass transfer during stationary and intermittent convective drying Monia Khereddine, Mohamed Hamdi, Daoued Mihoubi
8	244	Practical Implementation of Route Optimization to Minimize Energy Consumption by Electric Vehicles Mahmoud Allan, Muhannad Al-Tarifi, Murad Yaghi, Moussa Habib
9	246	Machine learning techniques for forecasting daily global solar radiation ahead A. Takilalte, S. Harrouni, L. Mora-López, M. Laissaoui, A. Bouhallassa
10	116	Robust Grid Synchronization PLL Algorithms for Harmonic Distorted and Unbalanced 3-Phase Grid conditions. smail toufik, Boumaza Hassan

HEBF : Hydrogen Energy and Bio Fuels

Slot 1 : December 16th , 10:00 AM - 12:30 PM

Room 1

Chairs:

Mejdi Jeguirim , France

Abdeslam-Hassen Meniai , Algeria

Order	ID	Paper
	31	Production of bioalcohol from dates with low market value in the Adrar region Tahri Ahmed, Khelafi Mostafa
	41	Patent mapping and analysis for Hydrogen production technology Nawel OUTILI, Abdeslam Hassen MENIAI
	61	Synthesis of biochars from date palm and marble wastes and use for phosphorus recovery from aqueous solutions: static and dynamic investigations Salah Jellali, Majida Al-Harrasi, Maram Al-Balushi, Ahmed Al-Raeesi, Yassine Charabi, Jamal Al-Sabahi, Mejdi Jeguirim
	91	Enhancement of indigenous microalgae cultivation using cheese whey as carbon source for bioenergy and coproducts production Mohammed Amouri, Sarah Belkhodja, Sarah Masrouf, Fayrouz Kaidi, Majda Aziza
	134	A Sizing and Dynamic Model for a Green Hydrogen as Energy Storage Technique for The Hybrid System 50KW Solar PV With PEM Fuel Cell Ibrahim Tawil, Mohamed Albarghot, Ezuldeen Abraheem
	146	Technical Economic study for Electricity and Hydrogen Production by Using hybrid solar-wind energy in Tunisia Slah Farhani, Faouzi Bacha
	148	Evaluation of sustainable hydrogen production from off-grid solar power Arthur Devaux, Meriem Nachidi, Fernando Tadeo
	157	Hydrogen desorption properties by the Mg50Ni50 amorphous alloy Chaker Briki, Sihem Belkhiria, Abdelmajid Jemni
	221	Effect of placing alternated baffles in flow channels on performance of a solid oxide fuel cell Asma Naouar, Hacen Dhahri, Abadallah Mhimid

Order	ID	Paper
	229	Hydrogen recovery from wastewater by an electrochemical process: Feasibility study Fatiha LASSOUANE, Abdelhamid MRAOUI, Camelia CHEMLAL, Ishak BENSLIMANE

Slot 4 : December 18th , 10:00 AM - 12:30 PM

Room 2

Chairs:

Ahmed Mediani , Algeria

Abdeslam-Hassen Meniai , Algeria

Order	ID	Paper
1	190	Performance analysis and optimization of stand-alone solar PV system for green hydrogen production: Case study in Constantine, Algeria Ilyès Nouicer, F. Meziane, S. Menia, N. Kabouche, C. Ghenai
2	101	Optimal Design of Methane Reforming Reactor: Numerical Analysis of Two and Three- Dimensional Microchannel-Type Reactors Using OpenFOAM Bouchra Elarfaoui, Abdelhakim Settari, Khaled Chatehouna
3	102	Structural and hydrogen storage properties of the Fe ₂ O ₄ Ni _{0.5} Cd _{0.5} doped iron oxide Sihem Belkhiria, Chaker Briki, Abdemajid Jemni
4	132	Coffee grounds and Orange Peels: An innovative resources for Hydrogen generation through Pyrolysis Sana Kordoghli, emna fassatoui, besma khiari, jean largeau, fethi zagrouba
5	137	Scaling down a PEM electrolysis system for lab-scale test bench: a power performance perspective Hamid Hamza, Marcos Da Conceicao, Zhifeng Zhang, Mohamed Keddar, Mamadou Lamine Doumbia
6	138	Hydrogen storage performance of LaNi _{3.6} Al _{0.4} Mn _{0.3} Co _{0.7} metal hydride powder HARRAT Safia, BRIKI Chaker, SAHLI Mounir, SETTAR Abdelhakim, CHETEHOUNA Khaled, JEMNI Abdelmajid
7	145	To what extent can animal manure meet Tunisia's biomass target? Amani Jemili, Essia Znouda, Chiheb Bouden

Order	ID	Paper
8	149	Anaerobic digestion of the textiles wastewater: Enhancement of the fermentation conditions Ahlem HOUCINE, Ahlem SAKLY, Souheil EL ALIMI, Abdelmajid JEMNI
9	223	Levelized Cost of Hydrogen Analysis for Alkaline Water Electrolysis-Photovoltaic Energy Technology in The Near Future (2025-2050) of Algeria Hammou TEBIBEL, Abdelhamid M'raoui, Sabah Menia
10	243	Advancements, Challenges, and Outlook of Fuel-Cell Electric Vehicles (FCEVs) Hashem Alaraideh, Moussa Habib, Murad Yaghi, Muhannad Al-Tarifi

MCEG : Materials For Clean Energy Generation

Slot 1 : December 16th , 10:00 AM - 12:30 PM

Room 1

Chairs:

Mejdi Jeguirim , France

Abdeslam-Hassen Meniai , Algeria

Order	ID	Paper
	42	Optimisation of binder formulation for sawdust pellets Amani Amairi, Boutheina Benkhaoua, Chahinez Azzaza, Nawel Outili, Abdeslam Hassen Meniai
	86	Synthesis and characterization of CdCO ₃ -CdO nanocomposite thin films as a potential material for renewable energy applications Billal Saadi, Redouane Miloua, Mohamed Ouassini Bensaid, Samir Kadi, Abdelkader Nakrela, Attouya bouzidi, Mourad Medles, Mohammed Khadraoui
	109	Effect of Reaction Time on Epoxidation Efficiency of Waste Cooking Oil Hania Chenni, Nawel Outili, Abdeslam-Hassen Meniai
	165	Evaluation of DC Performance of Buffer-free AlGaIn/GaN HEMT on SiC Relative to the Thickness of AlN Nucleation Layer Sahalu Hassan, Nasiru B. Kadandani, Mahmud Dwidar, Kaivan Karami, Edward Wasige, Abdullah Al-khalidi
	196	Study of reactivity of Moringa Oleifera Seed as biocoagulant for removal of hexavalent Chromium ARRIS Sihem, Metnani nourelhouda, Benaidja Noudjoud, Debache Fares, Aissaoui Halima, Meniai Abdeslem-Hassen
	197	The use of pomegranate peels as low-cost adsorbent in the removal of cationic dye from wastewater: kinetic study Amina Abbaz, Sihem Arris, Abdeslam-Hassen Meniai
	199	Recovering agricultural waste as adsorbents to remove antibiotics from wastewater Naima Gherbi
	213	Study of biomaterial use in coagulation flocculation of cutting oil emulsion Halima Aissaoui, Sihem Arris, Abdeslam hassen Meniai

Order	ID	Paper
	231	Biofertilizers production from lignocellulosic biomass Meryem Saber, Khaled Latreche, Houda Bouhoui, Brahim Miourigh
	241	Photocatalytic evolution of hydrogen by the new spinel ZnMn ₂ O ₄ under visible light irradiation Souaad Douafer, Rima Laouici, Imen Kihal, Hicham Lahmar, Mohamed Trari, Messaoud Benamira
	254	Heat treatment effect on CdS thin films grown by Chemical Bath Deposition for photovoltaic application S. BOULAHDJEL, S. SALI, S. BOUAFIA, S. KERMADI, M. SIDIALI, L. ZOUGAR, H. LABECHE, M. AYACHI
	206	Simultaneous Recovery of Sulfate and Ammonia from Treated Brine: A Comprehensive Approach Utilizing Chemical Precipitation and Electrocoagulation Ameera F. Mohammad, Aya A-H. I. Mourad, Ali H. Al-Marzouqi
	218	Integrated Brine Salinity Reduction, CO ₂ Capture, and Valuable Product Recovery via Modified Solvay Process: An Overview Ameera F. Mohammad, Aya A-H. I. Mourad, Ali H. Al-Marzouqi

Slot 2 : December 16th , 03:00 PM - 05:30 PM

Room 3

Chairs:

Mejdi Jeguirim , France
Slah Farhani , Tunisia

Order	ID	Paper
1	30	Bacterial activity of onion seed oils extracted by supercritical CO ₂ at different operating conditions Selma Mestour, Sarra Melloul, Abdeslam-Hassen Meniai
2	90	Utilizing the controlled hydropower system to Harness the collected Water in drainage sinks for power generation. O. Hussein, Faiz F. Mustafa, Sadoon Radhi Daham, waleed K. S. AL-JUMAILI, Ameer Hussein Morad
3	142	Incorporation of pomegranate peels powder and extracts with gelatin films for active foods packaging Nihel Ben Slimane, Maria del carmen Garrigos, Alfonso Jimenez, Marina Ramos, Mohamed Bagane

Order	ID	Paper
4	171	Cellular aluminum structure for enhancing heat transfer in PCM storage system Krzysztof Naplocha, Anna Dmitruk, Natalia Ra?ny, Martyna Piechowska
5	180	Substitution effect of chloride by bromide atoms on efficiency and stability of the perovskite solar cells Wahiba Tlili, Sarra Bouazizi
6	239	Optimization of the binary interaction coefficient for prediction of the solubility of Geranyl butyrate and 10-udecen-1-ol in supercritical carbon dioxide using a genetic algorithm GA Hassina Bezaze, Sacia Kachi, Ahmed Zaidi, Mohamed Kerikeb, M.A. Yallese
7	247	Study The Operating Variables Of Reactive Distillation By HYSYS Software Khaled M. Elmarimi, Khaled Saad Saad Ghitoun
8	248	Numerical simulation of fins' effect on the Performance of a Metal Hydride Reactor) DADDA Bachir, BOUHADDA Youcef, BABOU Allal, AISSA Mohamed, BAMMOUNE Abdelazize

SGBC : Smart-Grids, Zero Energy Buildings and Sustainable Cities

Slot 1 : December 16th , 10:00 AM - 12:30 PM

Room 3

Chairs:

Mohamed Keddar , Canada

Mohamed Kesraoui , Algeria

Order	ID	Paper
1	96	Optimal Operation Strategies of Vanadium Redox Flow Battery for Residential Peak Shaving Stanislav Bogdanov, Sergei Parsegov, Petr Vorobev, Federico Ibanez, Mikhail Pugach
2	98	Sensorless Dead-beat Control of Three-Phase Inverter for Stand-Alone Distributed Generation Systems Meriem Dardouri, Khaled Jelassi, Slim Tnani, Mahrane Khalfoun
3	119	An efficient Harris Hawk Optimization strategy for optimal microgrid energy planning Naoual Seddaoui, Sabri Boulouma, Hocine Belmili, Toufik Smail, Lazhar Rahmani
4	122	A Comparative Study of Airtightness in Modern Buildings within a Semi-Arid Climate Using Blower Door Tests Houda ER-RETTY, Niima ES-SAKALI, Mohamed Oualid MGHAZL, Mohamed EL MANKIBI, Mostafa BENZAAZOUA
5	125	Energy Management Algorithm of Hybrid DC Microgrid Using MPC Approach Laabidi Houda, Mami Abdelkader
6	144	Feasibility Study of a Micro-Grid Based on Renewable Sources and its Impact on the Energy Transition in the Building Sector Hatem Oueslati, Neila Bedioui, Rania Loukil, Majdi Hizami
7	154	MOGA-Based Design and Control of a DC-DC Buck Converter with Voltage and Current Loops Asma Alfergani, Salma Elkawafi, Tasneem Mohamed Nour, Ashraf Khalil, Faisal Mohamed
8	162	EMT Modelling of a Laboratory Platform with integrated PV systems for Voltage Unbalanced Analysis H. Helali, I. Slama-Belkhodja

Order	ID	Paper
9	167	Towards Net Zero Energy Buildings in Different North African Climates: A Case Study Islam Shahboun, Samah Alghoul, Elhadi Dekam
10	97	Super-Twisting Sliding Mode Control of Three-Phase Grid-Connected Converter for PV applications Meriem Dardouri, Khaled Jelassi, Slim Tnani, Mahrane Khalfoun

Slot 4 : December 18th , 10:00 AM - 12:30 PM

Room 3

Chairs:

Meriem Dardouri , Tunisia

Mohamed Kesraoui , Algeria

Order	ID	Paper
1	4	An investigation into Power quality improvement in smart grids with electric vehicles Fatma Zohra Dekhandji, Abdelmadjid Reciou
2	20	On the Impacts Renewable Energy on Distribution Power Systems Wesam AbAsaleek, Ahmad Harb, Mutasem Alhusseini
3	21	The improved low cost grid connected EV charging station with PV and energy storage systems Nedim Tutkun, Shamsul Aizam Zulkifli, Zarafi Bin Ahmad
4	36	Measurements of the frequency-dependent on-board impedance of ships with AC and DC grids Michael Terörde, Thanh Trung Do, Tönjes Alberts, Klaus Brand, Edward Sciberras
5	57	Energy Efficiency Performances for a Modular House via Air Conditioning Mohamed Ali Djebiret, Maamar Ouali, Ali Tetbirt, Mehdi Mokrane, Mohand Berdja, Ferhat Yah
6	66	Optimal Control of Smart Grid Energy Distribution Naziha Labiadh, Imen Amdouni, Lilia El Amraoui
7	71	Analyzing the Pattern of the Jordanian Electricity Peak Load Amid Renewable Energy Transition Considering the GDP and Population Growth Rafat Aljarrah, Mohammad Ghazal, Tayma Afaneh
8	76	Design and Implementation of an IOT solution for Energy Management (Smart Building Application) Rania Loukil, Neila Bedioui, Hatem Oueslati, Majdi Hazami

Order	ID	Paper
9	81	Energy Rationalization by PV Domestic Refrigerator with CTES Maamar Ouali, Mohamed Ali djebiret, Mehdi Mokrane, Ali Tetbirt, Mohand Berdja, Ferhat Yah
10	179	Distributed Energy Resources for Smart Energy System Eng. Sayed Ajaj, Eng. Marai khalifa

PVE : Photovoltaic Energy

Slot 2 : December 16th , 03:00 PM - 05:30 PM

Room 2

Chairs:

Mebrouk Bellaoui , Algeria
 Abdeslam-Hassen Meniai , Algeria

Order	ID	Paper
1	29	Conception and optimization of Photovoltaic Thermal collector- Parametric study Khaled Touafek, Abdelkrim Khelifa, Mohamed Lebbi, Lyes Boutina, Hafsia Haloui, Yehya Houam, Abdelkader SI Tayeb, Oulad Sidi Amar Zighem
2	43	Contribution of CEEMDAN decomposition in enhancing the forecast of short-term global solar irradiation Kacem Gairaa, Mawloud Guermoui, Mohammed Zaiani, Sabrina Belaid, Said Benkacali
3	48	"Strategies for integrating PV systems into the building envelop ""PVIB"": Rational sizing of standalone photovoltaic system" bensaha Abdelmadjid, Bekkouche Sidi Mohamed El Amin, Djeflal Rachid, Hamdani Maamar, Cherier Mohamed Kamal
4	51	New configuration of solar photovoltaic energy conversion cascade based single-phase three-level NPC inverter Practical application in south Algeria Oum kalthoum LAHOUDJI
5	60	Performance Analysis and Investigation of a 9.8-kW Grid-Connected Solar PV Facility in KSA Mounir Bouzguenda
6	234	DC Component Rejection in SOGI-PLL Algorithm for single-phase grid-connected Photovoltaic systems Abdalbaset Mnider, Mohamed Dahidah
7	99	Solar Power Optimization in Dynamic Environments Based on Hybrid Intelligent Robust MPPT Approach Hsen ABIDI, Lilia SIDHOM, Ines CHIH
8	112	Assessment of the thermal loads of a cold store using a solar photovoltaic system in a Saharan environment Tizzaoui Mouloud

Order	ID	Paper
9	115	Overheating in Residential Solar Systems: Towards Efficient Cooling Solution Ahmad Al Takash, Razan El Kassar, Adie Msadi
10	123	Assessment of solar photovoltaic system performance Alhassan Teyabeen, Abdulmageed Algareu, Faisal Mohamed

Slot 3 : December 17th , 10:00 AM - 12:30 PM

Room 2

Chairs:

Ahmad Harb , Jordan
Abdalbaset Mnider , UK

Order	ID	Paper
1	131	Viable Sustainable Development Solutions through PV Solar Technology: A Case Study for Libyan future Perspectives Shoroug Alweheshi, Zakariya Rajab, Ashraf Khalil, Ali Asheibi, Faisal Mohamed
2	135	Fault Response Analysis of Distribution Networks with Inverter-Based Resources using ATP/ATPDraw Simulations and Grid-Following Inverters: A Study on IEEE 9 Bus Saad Elshamikh, Naser El Naily, Haytham Yousef Mustafa, Faisal Mohamed
3	201	Estimating Power Outputs of Polycrystalline Silicon PV Modules Using Neuronal Approach: A case study in arid environment Idriss Hadj Mahammed, Kacem Gairaa, Amor Fezzani, Antar Beddar
4	225	Fuzzy Logic Modeling of stand-alone Solar System Hasan Shakir, Fatma Ben Salem
5	233	Study and test of a refrigerator powered by solar energy installed on a mountainous Mediterranean region djohra saheb, Melissa Oumedjekane, mustapha koussa, Khaled Bakria, Houria Assem, Farid Hadjriaoua, Billal Taghzouit, Nasreddine Belhaouas
6	62	Evaluating MPPT Techniques: Optimizing Photovoltaic Systems Under Partial Shading Conditions akram Djerourou, Azzeddine Dekhane, Ahmed Bouraiou, Issam Atoui
7	236	The Potential of the Rooftop Grid-Connected PV Systems in Libya Hana Shamatah, Salima Azouz, Zakariya Rajab, Ashraf Khalil, Gamal Hashem, Faisal Mohamed

Order	ID	Paper
8	237	Using Machine Learning to Compare the performance of two different technologies of PV module Farid hadjrioua, Hichem Hafdaoui, Nasreddine Belhaouas, El Amin Kouadri Boudjelthia, Houria Assem, Nadira Madjoudj
9	238	Aging effect simulation for Lithium-ion battery under operating conditions Aicha DEGLA, Madjid CHIKH, Samer BOUMECHETA, Mohammed Bilal DANOUNE, Youssef REHOUMA
10	78	Enhanced Sensor-Less Control of DFIG-Based Generators Using Hybrid MRAS-ANN Observer and PSO Parameter Optimization Lakhdar Saihi, Fateh Ferroudji, Khayra Roummani, Khaled Koussa

Slot 4 : December 18th , 10:00 AM - 12:30 PM

Room 1

Chairs:

Farid Hadjrioua , Algeria
Faisal Mohamed , Libya

Order	ID	Paper
	32	Bandwidth Extension and Absorption Enhancement in Amorphous Silicon Using cluster of Plasmonic Nano-Discs Abdalem Rasheed, Khalil Sayidmarie, Khalid Khalil
	33	Solar Energy in Algeria: Geographical Advantages, Photovoltaic Potential, and Policy-driven Initiatives in the Saharan Region Ahmed Bouraiou, Azzeddine Dekhane, Abdeldjalil Slimani, Abdelkrim Rouabhia, Ammar Necaibia, Abdeldjalil Dahbi, Salah Lachtar, Nadir Boutasseta
	50	Deep learning model for multivariate time series forecasting of global solar radiation in desert climate bellaoui mebrouk mebrouk, Bouchouicha kada, oulimar ibrahim, babahadj abdeljabar
	70	Realization of photovoltaic conversion cascade based single-phase five-level H bridge inverter for stand-alone application in south Algeria K. Benamrane, T. Abdelkrim, B. Benlahbib, N. Bouarroudj, A. Borni, A. Lakhdari, A. Bahri
	87	Towards new polymeric antireflection materials for silicon PV Panels: A multiscale simulation approach Mohammed Ouassini Bensaid, Redouane Miloua, Mohammed Khadraoui, Armand Soldera

Order	ID	Paper
	150	Control and optimization for a photovoltaic pumping system using induction motor vector control Salima Lekhchine, Tahar Bahi, Idris Laouar, Rayane Leulmi
	169	The degradation of the electrical performance of photovoltaic panels in south Algeria (Adrar) Asmaa MOHAMMED KRARROUBI, Aebelkarim ROUABHIA, Chaimaa MOHAMMED KRARROUBI, Mourad OTHMANI
	172	Outdoor study of efficiency of photovoltaic power plants with sun tracking in hot desert climate Layachi Zaghba, Messaouda Khennane, Amor Fezzani, Abdelhalim Borni, Abdelhak Bouchakour
	173	Design and implementation of efficient Low cost MPPT controller for Photovoltaic application Abdelhalim Borni, Layachi Zaghba, Abdelhak Bouchakour, Mohamed Louzazni
	186	Investigation of Optimal Sizing Processes for a Real Photovoltaic Pumping System for Agricultural Irrigation In Arid and Semi-Arid Climates Abdelhak Bouchakour, Noureddine Benbaha, Borni Abdelhalim, Seif Eddine Boukebbous, Hachemi Ammar, Zaghba Layachi, Fazzani Amor
	235	Electric Production and Losses: Off-Grid Photovoltaic Systems in Bou-Ismaïl Site Zarede Toufik, Ayad Mohammed and Mahfoud Abederezek

STE : Solar Thermal Energy

Slot 1 : December 16th , 10:00 AM - 12:30 PM

Room 2

Chairs:

Bashar Hammad , Jordan

Order	ID	Paper
1	27	High Power Tubeless Solar Water Heater Abderrahmane DIAF, Ferhat Kamel BENABDELLAZIZ
2	44	Experimental Study of the Drying of hot Red Pepper in the Solar Greenhouse dryer system Nadia Metidji, H. Bendjebbas
3	54	Efficiency evaluation of a hybrid solar water heating system applied to the greenhouse climate issam attar, Mariem Zaghdoudi, Hatem Oueslati
4	56	CFD Model Verification and Aerodynamic Analysis of crop number effect on soilless greenhouse climate Hasna Abid, Olfa Zghal, Mariem Lajnef, Hamza Chiboub, Giovanni Gugliuzza, zied Driss
5	84	Modeling and Analysis of Passive Solar Trombe Wall Systems Through Computational Fluid Dynamics Imane LANEZ, Brahim REKIK, Abdelhamid BOUHELAL
6	100	Numerical simulation of the thermal behavior of a Trombe wall with TRNSYS under realistic climatic conditions in Tunisia Nour Lajmi, Narjess Gudich, Noureddine Boukadida
7	103	Thermodynamic study of a mono-pressure cycle with propylene/n-decane mixture NESSRINE SOLI, KHAOULA HIDOURI, BECHIR CHAOUACHI
8	182	Feasibility study and performance investigation of a Munters-Platen cycle using new alkane mixtures as absorbents NESSRINE SOLI, KHAOULA HIDOURI, BECHIR CHAOUACHI
9	105	A Comparative Analysis of Low-Temperature Applications in CO2 Cascade Refrigeration Systems with Various Natural Refrigerants MARWA Romdhane, Nihel Chekir

Slot 2 : December 16th , 03:00 PM - 05:30 PM

Room 1

Chairs:

Ridha Djebali , Tunisia
Mohamed Kesraoui , Algeria

Order	ID	Paper
	46	Numerical study of Sensible thermal storage in solar collectors for air heating applications Amel Boulemtafes
	47	Accurate meso-scale simulation heat transfer in vented cavities with obstacles raoudha chaabane, nejia khoudi
	52	Parametric numerical study of micro/nanoparticle fluid flows energy-weight in heat exchanger for cooling PV-system Ali Tetbirt, Mohamed Ali Djebiret, Mehdi Mokrane, Maamar Ouali, Mohand Berdja, Ferhat Yahi, Sidali Guers
	121	Effect of solar drying on Agriculture Crops in rural Adrar region, Algeria mediani ahmed, akil loumani, larbi ahmed amine, braham chaouch wafa, foulanine meriama
	140	Efficient Solar Irradiance Prediction and Interpretation using Hybrid Nelder-Mead Optimization-Symbolic Regression Aleksandr Gevorgian, Giovanni Pernigotto, Andrea Gasparella
	153	Dynamic modeling and simulation of commercial R717-H2O absorption chiller powered by Fresnel solar collector Ismail BOUKHOLDA, Nizar BEN EZZINE, Ahmed BELLAGI
	183	Concentrating Solar power plant in algeria Mohammed LAISSAOUI, Housseyn KAROUA, Sabrina LECHEHEB, Amar BOUHALASSA, Abdelatif TAKILALT, Messaoud HAZMOUN
	195	Evaluation of solar collector mathematical models by experimental data for various modules under local conditions of Libya Mukhtar BenAbeid, Noaman Elsherif, Esra Rahem, Hussam Elsaadi

Slot 3 : December 17th , 10:00 AM - 12:30 PM

Room 4

Chairs:

Abdeslam-Hassen Meniai , Algeria

Order	ID	Paper
1	106	Modelling and simulation of a solar absorption refrigeration machine yosra ounis

Order	ID	Paper
2	133	Numerical simulation of non-isentropic compressible homogeneous sheared turbulence: thermodynamic effect of initial gradient Mach number Mohamed Riahi, Taieb Lili
3	156	Influence of mechanical ventilation on Greenhouse Microclimate in Sfax City Hasna Abid, Ahmed ketata, Mariem Lajnef, olfa zghal, Slim Zoouari, Giovanni Gugliuzza, Maroua Mejri, Emilia Arrabito, zied driss
4	184	Modeling and Performance Estimation of 153 MWe parabolic trough power plant in Djamaa Algeria karoua housseyn, laissaoui mohammed, Bouhallassa Amar, lecheheb sabrina
5	187	Study of solar energy storage system ability for greenhouse heating Ali BENHMIDENE, Marwa MEMI, Naima ANAYED, Khaoula HIDOURI, Bechir CHAOUACHI
6	207	Experimental Investigation of Solar Air Heaters with Different Absorber Plates Bashar Hammad, Ahmad Kattan, Nidal Abdalla, Mohammad Al-Abed
7	216	Experimental investigation and thermal performance analysis of a two-phase closed thermosyphon system Mohamed Sghaier Elmosbahi, Mohamed Hamdi, Majdi Hazami
8	224	Modeling of compressible homogeneous sheared non-isentropic turbulence: comparison between isothermal and isobaric initial conditions results Mohamed Riahi, Taieb Lili
9	249	Comparative Study between Two Greenhouses with Different Covering Methods Mohammed Aissa, Salah Bezari, Bachir Dadda, Azeddine Boutelhig, Salima Laouar
10	252	Influence of draw-off volume on the performance of an integrated storage solar water heater Bendjebbas Hichem, Mezidi Ahmed, , Abbas Mohamed, Metidji Nadia

WHE : Wind and Hybrid Energies

Slot 2 : December 16th , 03:00 PM - 05:30 PM

Room 1

Chairs:

Ridha Djebali , Tunisia

Mohamed Kesraoui , Algeria

Order	ID	Paper
	34	Windscares of Algeria: Assessing Potential, Challenges, and Future Prospects in Renewable Energy Ahmed Bouraiou, Azzeddine Azzeddine Dekhane, Abdeldjalil Slimani, Abdelkrim Rouabhia, Ammar Necaibia, Abdeldjalil Dahbi, Salah Lachtar, Nadir Boutassetta
	73	Improvement of the Wind Map using interpolation methods for a region in southwestern Algeria Sabiha Kheder-Haddouche, Hafida Daaou Nedjari, Samira Louassa
	151	Optimal sizing of a Hybrid Microgrid System using HOMER Pro in a Mediterranean Climate Aicha Melit, F. Chekired, N. Metidji
	205	Feasibility Assessment of Large–Scale Offshore Power Plants in Western Algeria Fares Meziane, Sidi Mohammed Boudia, Ilyes Nouicer, Nourdine Kabouche
	141	Analysis detailed on the steady state of the wind turbine based on DFIG with two different magnetization techniques Rayane Leulmi, Ammar Medoued, Salima Lekhchine

Slot 3 : December 17th , 10:00 AM - 12:30 PM

Room 3

Chairs:

Hatem Oueslati , Tunisia

Slah Farhani , Tunisia

Order	ID	Paper
1	25	Validating applied loads on Horizontal axis wind turbine blades using an Open-source software (Qblade) at various loading conditions Caden Huish, Praveen Shakya, Abdenmour Seibi, Mohammad Shekaramiz, Mohammad Masoum

Order	ID	Paper
2	26	Prediction of Wind Turbine Blades Fatigue Life Using the National Renewable Energy Laboratory Open-Source Software Matthew Thomas, Noah Boettcher, Abdennour Seibi, Mohammad Shekaramiz, Mohammad Masoum
3	53	Stability analysis of a composite VAWT blade under operating conditions Fateh Ferroudji, Lakhdar Saihi, Khayra Roummani, Khaled Koussa
4	55	CFD study of the effect of wind lens on the wake generated by a two-bladed Savonius wind turbine ahmed bekhti, mohamed debbache, fares meziane, madjid tata, dawoud hamane, ali boudis
5	68	Wind wake analysis under thermal stratification conditions Salima ADJIRI, Hafida DAAOU
6	77	Multi-objective optimization of windy sites in the north-west region of Algeria Hafida Daaou-Nedjari, Sabiha Kheder
7	127	Zephyr wind rotor performance enhancement: experimental and numerical investigation Mariem Lajnef, Mabrouk Mosbahi, Hasna Abid, Zied Driss, Tullio Tucciarelli
8	168	Improvement of the Meca-electrical wind pumping system Achour Djalloul, Mohamed Kesraoui
9	220	Numerical and experimental study of a twisted Delta-bladed Darrieus Wind rotor Mariem Lajnef, Mabrouk Mosbahi, Hasna Abid, Zied Driss, Tullio Tucciarelli