Mediterranean Green Energy Forum (MGEF-13) Programme

Contents

Cover: Bou Inania Madrasa image courtesy of Bjørn Christian Tørrissen

Chair's Welcome Message

The Mediterranean Green Energy Forum 2013 (MGEF-13) was a major international conference organised by a partnership made up of KES International, the World Renewable Energy Network and LSIS Marseilles, France, hosted by the Universite Sidi Mohamed Ben Abdellah, Fes, Morocco.

MGEF-13 was a combination of the annual KES Sustainability in Energy and Buildings conference and a regional meeting of the well-known World Renewable Energy Congress.

At no time in modern history has energy played a more crucial role in the development and well-being of nations than at present. The source and nature of energy, the security of supply and the equity of distribution, the environmental impact of its supply and utilization, are all crucial matters to be addressed by suppliers, consumers, governments, industry, academia, and financial institutions. The World Renewable Energy Congress (WREC), a major recognised forum for networking between these sectors, addresses these issues through regular meetings and exhibitions, bringing together representatives of all those involved in the supply, distribution, consumption and development of energy sources which are benign, sustainable, accessible and economically viable.

The Sustainability in Energy and Buildings conference wlecomes participation and paper submissions across a broad range of renewable energy and sustainability-related topics relevant to the main theme of Sustainability in Energy and Buildings. Applicable areas include technology for renewable energy and sustainability in the built environment; also optimisation and modelling techniques, information and communication technology usage, behaviour and practice, including applications.

MGEF-13 formed a welcome opportunity for researchers in subjects related to sustainability, renewable energy technology, and applications in the built environment to mix with other scientists, industrialists and stakeholders in the field.

The conference featured six General Tracks:-

- Direct Solar
- Sustainable Building: Science and Technology
- Novel Technologies
- Bioenergy Technologies
- Wind and Ocean Energy Conversion, and
- Smart Energy Technologies

In addition there was one Specialist Workshop and 10 Special Sessions

The conference attracted submissions from around the world. Submissions for the Full-Paper Track were subjected to a two-stage blind peer-review process. With the objective of producing a high-quality conference, only the best of these were selected for presentation at the conference and publication in the Elsevier Procedia Energy proceedings. Submissions for the Short Paper Track were subjected to a 'lighter-touch' review and published in an online medium.

Thanks are due to the very many people who have given their time and goodwill freely to make MGEF-13 a success. We are grateful to the Universite Sidi Mohamed Ben Abdellah, Fes, Morocco, for its valued support for the conference. We would like to thank the members of the International Programme Committee who were essential in providing their reviews of the conference papers, ensuring appropriate quality. We thank the high-profile keynote speakers for providing interesting talks to inform delegates and provoke discussion. Important contributors to the conference were made by the authors, presenters and delegates without whom the conference could not have taken place, so we offer them our thanks.

It is hoped that you will enjoy the conference and find the proceedings an interesting, informative and useful resource for your research.

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Organisation

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MGEF-13 is under the patronage of His Excellency
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The organisation and operation of the MGEF-13 conference is the responsibility of KES International and the World Renewable Energy Network.

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Invited Keynote Talks

Prof Ali Sayigh
World Renewable Energy Congress/Network (WREC/WREN), UK

Solar and Wind Energy will supply 50% of Global Electricity by 2030

Abstract: During the last 10 years, the yearly increase in photovoltaic (PV) application was more than 30%. Similarly, the same annual growth for wind energy is achieved. Presently there is more than 74 GW installed PV around the world equivalent to more than 60 nuclear reactors of 1100 MW. As for Wind Energy, there are more than 300 GW power installations globally. Solar thermal applications in heating, cooling, processed heat and desalination are all widely spread. The most effective small system is the evacuated tube collectors. China and Taiwan are covering more than 70% of the global market. Regarding concentrating solar power (CSP), Spain and USA are leading the market. Again more than 200 CSP already built or in the process to be built ranging from few MW to 500 MW. In term of employment and job scenario for example in the USA, renewable energy attributed to 13.5% employment growth compared with 2.4% national growth. The cost of electricity generation is in par with that of oil and gas electricity in most countries in Europe and America.
The paper will demonstration the importance of solar and wind applications in generating electricity and creating employment for green economy in many parts of the world.

Biography: British Citizen, Graduated from London University, & Imperial College, BSC.DIC, PhD, C Eng in 1966. Fellow of the Institute of Energy, and Fellow of the Institution of Electrical & Mech. Engineers, called now Institution of Energy and Technology, Chartered Engineer, Chairman of Iraq Energy Institute.
From 1966- 1985, Prof Sayigh taught at Baghdad University, College of Engineering; King Saud University, College of Engineering, Saudi Arabia; fulltime; and also Kuwait University as part time professor. He was Head of Energy Department at Kuwait Institute for Scientific Research (KISR) and Expert in renewable energy at AOPEC, Kuwait from 1981-1985
He started working in solar energy in September 1969. In 1972, he established "The Journal of Engineering Sciences" in Riyadh, Saudi Arabia and in 1984 he established with Pergamon Press his first International Journal for Solar and Wind Technology as an Editor-in-Chief. This has changed name in 1990 to Journal of Renewable Energy. He has been Editor-in-Chief of Renewable Energy incorporating Solar & Wind Technology,

published by Elsevier Science Ltd, Oxford, UK. He is editor of several international journal published in Morocco, Iran, Bangladesh, Nigeria and India.

He has been a member of ISES since 1973 and founder and Chairman of the ARAB Section of ISES since 1979. He was chairman of UK Solar Energy Society for 3-years and consultants to many national and international organizations, among them, the British Council, ISESCO, UNESCO, UNDP, ESCWA, & UNIDO.
Since 1977, Prof Sayigh founded and directed several Renewable Energy Conferences and Workshops in International Centre for Theoretical Physics, (ICTP) - Trieste, Italy, Canada, Colombia, Algeria, Kuwait, Bahrain, Malaysia, Zambia, Malawi, India, West Indies, Tunisia, Indonesia, Libya, Taiwan, UAE, Oman, Czech Republic, West Indies, Bahrain, Germany, Australia, Poland, Netherlands, Thailand, Oman, Korea, Iran, Syria, Saudi Arabia, Singapore, China, USA and UK.
In 1990, he established the World Renewable Energy Congress (WREC) and in 1992 the World Renewable Energy Network (WREN) which hold their Congresses every two years, attracting more than 100 countries each time. In 2000 he and others in UAE, Sharjah founded ASTF (Arab Science and Technology Foundation) and Regional WREC Conferences have been held in Sweden, Malaysia, Korea, Indonesia, Australia, UAE, Libya, China to name but a few. Prof Sayigh has been running an annual international seminar on all aspects of renewable energy since 1990, in the UK and abroad. In total there have been 86 seminars.
Prof Sayigh had supervised and graduated more than 34 Ph D, and 64 M Sc students under his supervision at Reading University and University of Hertfordshire when he was Professor 1986-2004.
He edited, contributed, and written more than 32-books, and published more than 500-papers in various international journals and Conferences.
In 2000-2009 initiated and worked closely with Sovereign Publication Company, then in 2010 with Ten Alps Publishing Company, to produce the most popular magazine at annual bases called Renewable Energy which distributed freely to more than 6,000 readers around the world. Presently he is the Editor-in-chief of Comprehensive Renewable Energy coordinating 154 top scientists, engineers and researchers contribution in eight volume published in 2012 by Elsevier Publishing Company, Oxford, UK.

Dr Mark Barrett
University College London, UK

Integrating buildings into energy systems

Abstract: Providing people with services such as heating, lighting and appliances in buildings engenders a large fraction of national energy consumption in most countries. To improve energy security and control carbon emissions, energy efficiency and renewable energy supply will have to be increased. But many renewable energy sources - such as wind and solar energy - are variable and unpredictable and so technologies such as storage and controls are required to match demand and supply hour by hour.
Using energy models, the talk will describe how the demands for services in buildings vary in time with people's activities and the weather, and the impact of energy efficiency on these demands. The dynamic performance of building energy systems such as heat pumps and solar heating will be described, and how public supplies of heat, gas and electricity can be configured to deliver energy to buildings given renewable inputs such as wind. Given correlations between demands and renewables, the role of storage, dispatchable generation and CHP in matching supply to demand and 'smart' control strategies will be explored.

Biography: Mark Barrett has a degree in Physics and Philosophy and a PhD in energy modelling. He has thirty five years experience modelling and developing policies for energy demand and supply systems, and transport systems so as to meet environmental, economic and energy objectives. He worked on solar energy, heat pumps and ventilation systems at the Building Research Establishment. He has developed overall scenarios of energy and emissions, and the transport (surface and aviation) and electricity sectors in European countries. He is currently working on dynamic energy systems including buildings and heat demand, renewable supply and storage. He has worked at both the international, national and regional level in the UK, Europe and Asia. He has worked for clients including Universities, the European Commission, the European Environment Agency, UK Government departments, the Japan Clean Air Programme, local authorities, private companies and consultancies, and non-governmental environmental organisations. He is now a Senior Lecturer at University College London and a Director of his own company, Sustainable Environment Consultants.

Dr Jazaer Dawody
Volvo Technology Corporation, Sweden

Fuel Cell based Auxiliary Power Units (FC-APU) for power generation in trucks with reduced CO2 release and sub-zero pollutant emissions

Abstract: To combat climate change and increase the EU's energy security while strengthening its competitiveness the European Commission has decided to implement the 20-20-20 targets to be met by 2020:

- A reduction in EU greenhouse gas emissions of at least 20% below 1990 levels
- 20% of EU energy consumption to come from renewable resources
- A 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.

Today EU depends on 50% import of energy and it is expected to increase to 70% the next 20 - 30 years. Greening road transport is necessary to achieve EU and world targets in emissions reductions. In the EU, 19% of total EU greenhouse gas emissions and 28% of CO2 emissions in 2005 are linked to the transport sector. More than 90% of total EU transport emissions are due to road transport. While total EU emissions declined, transport emissions increased continuously between 1990 and 2005 due to high growth in both passenger (28%) and freight transport (62%). EPA has estimated the emission from long haulage trucks in US at idling to;

- NO_x: 180 000 tons per year
- PM: 5 000 tons per year
- CO_2: 11 million ton per year

The increasing demand for electrical power when the vehicle stands still has lead to an increasing need for an onboard electric power generator which operates with high efficiency and very low emissions. A fuel cell based auxiliary power unit (FC-APU), with a diesel fuel processor is regarded as one of the most interesting options since it combines high efficiency, low emissions and the use of the same fuel as the main engine. FC-APU has been identified as an important way to increase efficiency of onboard power generation and reduce CO2 emissions and local pollution from truck, marine and aeronautic applications. This onboard generator or FC- APU, should be able to run when the main engine is shut off.

By developing a fuel cell based APU for truck application in Europe we can contribute to:

- Decarbonisation of transport
- Ensuring mobility: reliable, safe and secure transport
- Global competitiveness - growth & jobs

In this presentation, the development of Fuel Cell based power generators for mobile applications will be discussed in general. A particular attention will be given to an on-going European projects for the development of FC-APU systems for trucks application called FCGEN (Fuel Cell based power Generator) which is so far the first European project to develop and demonstrate a proof-of-concept complete fuel cell auxiliary unit in a real application, onboard a truck. The FCGEN project consortium is set up by leading OEMs, system integrators, components suppliers and research providers in Europe with long experience of collaborative research and development on the key components and subsystem needed for the APU.
The FCGEN project started in November 2011 and will be ended in October 2014. The FC-APU system which is developed within the FCGEN project consists of a low-temperature PEM fuel cell, a diesel fuel processor and necessary balance of plant components which are designed to meet automotive requirements regarding e.g. size, mechanical tolerances, durability etc. High targets are set for energy efficiency and therefore this will significantly lead to emissions reductions and greener transport solutions in line with EU targets.

Biography: Jazaer Dawody has a PhD degree in Materials Science from Chalmers University of Technology and a M.Sc. degree in Physical Chemistry from Gothenburg University. She is currently working at Volvo Technology Corporation in Gothenburg Sweden as project manager for both European and Swedish projects for the development of Fuel Cell-based Auxiliary Power Units s as well as energy efficient low emission exhaust gas aftertreatment systems for mobile applications. Dr. Dawody has also been working at Powercell Sweden as manager for the development of fuel converter systems and as senior researcher at Chalmers University of Technology in Gothenburg Sweden. She has a strong background in catalyst preparation, characterization, deactivation, performance optimization, reaction kinetics and modeling. She is a member of the scientific committee of CAPoC (Catalysis and Automotive Pollution Control) and chair for the Hydrogen and Fuel Cells technical committee of WREC.

Prof Ahmed Ennaoui
Helmholtz-Zentrum Berlin, Berlin, Germany

Thin-film Photovoltaic Technology: The Coming Decade of Opportunity

Abstract: Thin-film PV technology has the advantage using a semiconductor layer a few microns (μm) thick, which is about 100 times thinner than current c-Si cells. Most thin films are based on direct band gap absorbers, which mean they are able to absorb the energy contained in sunlight with a much thinner layer than indirect band gap semiconductors such as traditional c-Si. The most common thin-film semiconductor materials are cadmium telluride (CdTe), amorphous silicon (a-Si). However multinary chalcogenide such as $Cu(In,Ga)(SSe)_2$, CIGS are the most promising materials for PV. They offer opportunities for innovation and creativity with the common goal of cutting production costs for photovoltaic solar energy conversion. Highly absorbing layer is typically deposited on a substrate. Molybdenum coated Glass is a common substrate however thin films can also be deposited on flexible substrates such as metal and polymer, which allows for the potential for flexible lightweight solar modules. CIGS thin films PV are very sensitive to water vapor and therefore research on new encapsulation to maintain performance is required. Another problem related to CIGS is that Indium (In) is a rare element and could run low within the next 10-20 years, while the price is already now increasing rapidly. A new material namely kesterite $Cu2(Zn,Sn)(S,Se)_4$, CZTS have emerged replacing In(III) ion with Zn(II) and Sn(IV). The number of research groups on this material has increased dramatically, after the work of IBM team on CZTS with conversion efficiency exceeding 10% using low cost non-vacuum methods [1]. We believe that the use of non-vacuum methods will open many opportunities to achieve the electricity price parity resulting in large-scale world deployment of PV technologies. Other PV technologies referred to as third-generation PV are being developed. Dye-sensitized solar cells use dye molecules absorbed onto a nanostructured substrate to absorb solar radiation, Organic PV (OPV) solar cells, based on polymers or small molecules with semiconductor properties. Quantum dots with physical properties similar to both bulk semiconductors and discrete molecules have the potential to achieve higher efficiencies through multiple exciton generation. In this paper we describe current status of PV technologies and address a wide range of low cost non vacuum methods including the challenges to the commercialization of solution-processed PV technologies. Particularly we will present our research on low cost fabrication of metal chalcogenide materials such as CIGS and CZTS and devices as well as the characterization of their properties [2,3].
[1] S. Bag, O. Gunawan, T. Gokmen, Y. Zhu, T. K. Todorov and D. B. Mitzi, Energy Environ. Sci., 5 (2012) 7060.

[2] Xianzhong Lin, Jaison Kavalakkatt, Kai Kornhuber, Daniel Abou-Ras, Susan Schorr, Martha Ch. Lux-Steiner and Ahmed Ennaoui, RSC Advances, 2012, 2, 9894-9898
[3] Ahmed Ennaoui Renewable Energy 49 (2013) 68-71

Biography: Prof. Dr. Ahmed Ennaoui was born and brought up in Morocco. He studied Physics and Chemistry and holds in 1976 his M. Sc. degree in solid state electronics from the University of Bourgogne (France) and then earned a doctorate in solid state electronics in 1979 on solar energy conversion for water splitting using Titanium oxide electrodes. He joined the University Mohamed V, Morocco in 1979 and served as professor of physics. From 1983 to 1987 he worked for his Habilitation degree with Prof. Helmut Tributsch at the Hahn-Meitner-Institute, Berlin/Germany. He obtained in 1987, his Habilitation with the highest honor: summa cum laude for his work entitled "Iron Disulfide, FeS2: Synthesis, (photo) -electrochemistry, physical properties and application for solar energy conversion". Most important results of this habilitation-thesis were published as invited chapter in the journal Solar Energy Materials and Solar Cells, (Volume 29 (1993) Issue 4, Pages 289-370) with the title: Iron disulfide for solar energy conversion. Presently he is working as Senior Scientist and head of a research group in the institute of heterogeneous material systems at "Helmholtz-Zentrum Berlin für Materialien und Energie GmbH", HZB (the former Hahn-Meitner-Institute, HMI). His research covers the processing of new materials, properties and applications in Photovoltaic emerging technologies. He is supervising at HZB both PhD and M. Sc. students as well as postdoctoral associates. He is involved in different grant projects financed by the European commission, the Federal Ministry of Education and Research (Germany). He is executing HZB's strategy exploring the topic: Scaling up Cadmium free buffer layer for production scale Cu-chalcopyrite absorbers provided by different industry partners in collaboration with the competence center "PVcomB - Kompetenzzentrum Dünnschicht- und Nanotechnologie für Photovoltaik Berlin" Meanwhile he is supervising student at "Freie Universität" Berlin on the Renewable Energies Seminar "Lehrseminar Erneuerbare Energien". Since 2009 he work in collaboration with the Research Center for Solar Energy Chemistry at Osaka University, and taught several talks on the topics: Research Opportunities in Cu-chalcopyrite Materials and electroplating of binary and ternary compounds for PV applications. Ahmed Ennaoui is author and co-author of more than 160 scientific papers and 3 patents all of them on innovative materials for solar energy conversion. He published two special issues in the journal Solar Energy Materials and Solar Cells and 4 more other journals. He is also serving as Scientific Advisory Board member for the Moroccan "Institut de Recherche en Energie Solarie et Energies Nouvelles, IRESEN". His research interests are in advanced materials, nanosynthesis, photoelectrochemistry, solid state devices. He is now exploring Cu-Kesterite

Cu2ZnSn(S,Se)4 NPs ink, novel fabrication techniques, non-vacuum techniques and novel device concepts for next generation solar cell.

Prof Andrew Geens
Chartered Institute of Building Services Engineers (CIBSE), UK

Energy Efficiency - The new.....Energy Efficiency

Abstract: The cyclical nature of political interest in the energy performance of buildings in the UK can be traced back to the early 1970s when it was triggered by concerns over security of supplies at a time when oil was an imported commodity. With the development of North Sea oil and gas, security of supply became less of a concern and interest waned. More recently, interest has been driven by concerns over the effect that the burning of fossils fuels might be having on the climate, although it may be no co-incidence that the political will to tackle this problem is evident at a time that the UK, having depleted its reserves of gas and oil in the North Sea is once again a net importer of these fuels.
The implementation of the 2007 Energy Performance of Buildings Directive in the UK (and its re-cast) and other recent energy conservation initiatives such as the Green Deal have resulted in political enthusiasm and support for "new" technology like heat pumps and water turbines. However whilst innovation is being encouraged on the one hand, on the other hand attempts to manage energy better in existing buildings are being shunned. It is against this background that this paper aims to identify what, if anything has been learnt in the last 40 years and what the research community needs to do to avoid another wasted 40 years.

Biography: Professor Andrew Geens is Head of CIBSE Certification in London and an Associate Academic at Cardiff Metropolitan University where he is supervising a number of PhD projects related to the energy performance of buildings. Andrew was formerly a Principal Lecturer in the Faculty of Advanced Technology at the University of Glamorgan. A Chartered Engineer and Fellow of the Chartered Institution of Building Services Engineers, his particular interests in indoor air quality, energy performance of buildings and low energy design of buildings are reflected in his teaching, research and consultancy activities. Andrew is actively involved in examining, assessing, and training Non-Domestic Energy Assessors and is accredited to produce Certificates himself.

Rainer Hinrichs-Rahlwes
German Renewable Energy Federation, Germany

Renewable Energy for secure energy supply and climate protections - Experience from Europe and Germany in the global context

Abstract: Based on the experience of some frontrunner and pioneer countries, an increasing number of states and provinces world wide have developed policies for Renewable Energy in all sectors: electricity, heating & cooling and transport. They have set targets and developed specific policies to foster growth of Renewables. Investment in Renewables and significant growth rates can increasingly be observed globally, with the pioneer countries still as strong competitors but with global deployment accelerating quickly. Based on experience in Germany (in particular the success of the feed-in system for the electricity sector) and in the European Union as a whole, with China, India and other developing countries following suite Renewable Energies are bound to become major and increasingly dominant sources of global energy supply. I will discuss challenges and benefits for an ambitious transition towards Renewable Energy in an increasing number of countries - developed and developing, north and south.

Biography: Rainer Hinrichs-Rahlwes is the President of EREC, the European Renewable Energy Council, the umbrella organization of European renewable energy industry, trade and research associations. And he is the President of EREC's member Association EREF, the European Renewable Energies Federation, the voice of independent producers of energy from renewable sources.
He is a Board Member of the German Renewable Energy Federation (BEE). He is BEE's Spokesperson European and international affairs, and he is the Chairman of BEE's related working group.
From November 1998 to December 2005, he was a Director General in the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), in charge of - among others - renewable energies and climate protection. He was one of the two chairmen of the International Steering Committee preparing the renewables2004-conference in Bonn. After the conference, he served as BMU's representative and a co-chair and later a member of the Bureau of the Global Policy Network, now known as REN21.

Prof Yasser Gaber Dessouky
College of Engineering and Technology, Arab Academy for Science and Technology and Maritime Transport, Egypt

Renewable Energy and Energy Efficiency Policies

Abstract: A major transition of the energy sector is needed if the global issues of energy security, energy access, sustainable development and climate change are all to be adequately addressed this century. Whereas many of the policy initiatives and negotiations relating to energy and climate change are being undertaken at the national and international levels, in parallel many leading cities and towns are taking their own decisions concerning their energy destiny - and their actions are beginning to have an impact. Their collective voice is starting to be heard at the most recent climate talks which are aiming to reach a new framework agreement.
This keynote presents an overview of renewable energy resources and technologies and identifies and describes successful case studies. It will examine the potential for the greater deployment of renewable technologies in built-up environments, including implications for supporting policy development. It evaluates successful policies in selected towns and cities that have enabled the cost-effective deployment of renewable energy (including by investing in "green" electricity projects and purchases, distributed heat and power generation and transport biofuels). These initiatives are often developed in association with national policies and in accordance with supportive energy efficiency measures.
This keynote includes methods of identifying local renewable energy resources, overcoming barriers to implementation, and a review of state-of-the-art technologies. Technologies evaluated include district heating and cooling; combined heat and power from biomass and geothermal sources; distributed generation mainly from solar, wind, geothermal and biomass; smart metering; intelligent networks; and biofuel production. The focus is on technologies and policies that will enable the cost-effective deployment of renewable energy heat, power and transport fuel use in cities, towns and also island communities.

Biography: Yasser Gaber A. Dessouky is Currently a professor in the Electrical and Control Engineering, in the Arab Academy for Science, Technology and Maritime Transport (AASTMT) since 2006. He got his Ph.D. from Heriot-Watt University, UK in July 1998. He was the Vice Dean for International Affairs from August 2008 to Jan. 2011, and the Program Chair, Electrical & Control Eng. Department from Feb. 2011 to Sept. 2012. He is the AASTMT focal point to the Ministry of Scientific Research, RDIN.

He is a Senior Member in IEEE and Member in IET, the Chair of Industry Relations Subcommittee, IEEE Alexandria and the representative, BEIE/IET Alexandria Subsection. He is Member of the board of Reseau Mediterraneen des Ecoles d'Ingenieurs (RMEI), France. Professor Dessouky is an Editorial board member for many Journals and a consultant with the two Industrial Companies, Alexandria. He is a leading and working in many Scientific Research projects. He has a patent from the Patent Office in UK. He supervised many MSc and PhD projects and Peer Reviewed in many international journals, Transactions and Conferences. He has more than 45 papers in international conferences and journals.

Prof Anne Håkansson
KTH The Royal Institute of Technology, Sweden

Environmental Impact Assessment - Assess for Sustainability

Abstract: Environmental Impact Assessment (EIA) method assesses the implications of construction, such as, a building, dam site and hydropower development and river regulation, road or motorway, or an airport, will have on surrounding environment. The implications include the effects on the nature, natural resources, as well as, society and economics.
One of the benefits of the EIA method is the growing awareness of and concern with environmental issues at all levels of society. The impacts on society, the social impact assessment (SIA) reviews the social effects caused by the constructions, like infrastructure, agriculture and other projects [1].
Society increasingly recognises the need to incorporate environmental considerations into economic development. Here, the economic development refers to sustained and concerted actions of policymakers and communities promoting critical infrastructure, environmental sustainability and standard of living and economic health.
Adopting social impact assessment as a part of the environmental impact assessment in formal planning systems and including economic development give a unique assessment combination that promotes sustainability.
The EIA method ensures that the implications are considered before making any decisions about building the constructions. These judgements, often based on social and economic criteria, reflect the political reality of impact assessment in which significance is translated into public acceptance and desirability.
An applied EIA method facilitates the integration of environmental factors into the development process and generates alternatives that minimise the wasteful use of natural resources and reduce the impact on the environment [2]. Furthermore, EIA is centred on the effects of human activities and involves society making value judgements concerning the significance and importance of these effects.
Hence, EIA method is a sequential set of activities designed to identify and predict the consequences an action has on the bio-geophysical environment and on man's health and well-being. It is also designed to interpret and communicate the information about the consequences. The set of activities and the consequences can be provided and pinpointed via knowledge-based systems [3].
In this talk, the technology for sequential set of activities of EIA is the focus. The computer systems can support and give tools to carry out the set of activities to achieve the best and most sustainable solution for the environment and the construction to be built. It makes use of large data sets and satellite images to provide

data, information and knowledge about the area that will be affected by the construction. With this information at hand, the evaluations of the impacts are more valid, which makes the decision sustainable.

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Biography: Anne Håkansson is an Associate Professor in computer science at KTH The Royal Institute of Technology, Stockholm, Sweden. In 2004, she received a PhD in Computer Science at Uppsala University, Uppsala, Sweden and her research has focused on intelligent systems and knowledge based systems for different application areas, such as, environmental impact assessment, large data sets and context. For her work through the years, 2012 she received a KES Award for outstanding contributions to the activities and status of the KES organisation and become an ambassador for Uppsala, Sweden, 2009.

1993, Associate Professor Håkansson participated in developing computer systems for assessing environmental impacts at dam sites and hydropower projects for developing countries in tropical climate. Moreover, she has arranged conferences including, SEB'12 Sustainability in Energy and Buildings, Stockholm, Sweden and is the editor of IJSEB, International Journal of Sustainability in Energy and Buildings.

Dr Anders Hellman
Chalmers University of Technology, Sweden

Hematite, a promising photoelectrochemical material

Abstract: In the novel "L île mystérieuse" Jules Vernes writes "water will be the coal of the future". This is the passing conclusion of the main characters after a lengthy discussion on whether the known coal reserves of that time would be depleted within the near future. The discussion in the novel is still very relevant. Although Vernes will never be right about water being used as fuel (thermodynamics considerations), water still is a key element in the envisioned future hydrogen-based energy infrastructure. With enough supply of energy, water can be separated into its elementary components, hydrogen and oxygen, in which hydrogen for example; can be used as fuel in a fuel cell.

Absorption of sunlight can be coupled directly to electrochemical processes in photoelectrocatalytic devices that produce fuel directly. However, there are a number of processes that are important for the concept; the first is the actual capture of photons, the second is the creation of electron-hole pairs that should be separated. The separated electron-hole pair then needs to be transported to a site, preferable catalytically active, on which the transformation to chemical energy can occur. In order to find new and improved catalysts for the photoinduced water oxidation reaction it is necessary to have an atomistic understanding of the underlying multifarious physicochemical phenomena [1]. Recently developed modeling methodology provides first-principles insights into the thermodynamics of photoelectrochemical reaction energetics [2].

I will show what can be addressed using this methodology, and I will use recent results for water oxidation on hematite [3] as case study. For instance, under steady state photoelectrochemical reaction condition, the presence of the photogenerated hole at the VBE will destabilize many surface terminations and only O3-Fe-O3-R and O3-R are stable. Further, water oxidation is thermodynamically feasible only on (HO)3-Fe-H3O3-R, (HO)3-Fe-O3-R, O3-Fe-O3-R terminations. Thus, the modeling studies suggests that if (HO)3-Fe-H3O3-R is present in the system, it will be converted to O3-Fe-O3-R at steady state illumination, and over this termination, photoinduced water splitting is allowed thermodynamically.

However, although the water oxidation reaction is allowed on hematite, there are some problematic properties that prohibit us to utilize hematite in photoelectrochemical devices. Two important ones are the weak photoabsorption and the short diffusion length of the generated electron-hole pairs. I will also discuss recent development [4] in the use of metal nanoparticles (MNP) that interact strongly with light (plasmon active particles). Combining hematite with MNP results in

improvement of the photoabsorption properties of hematite as well as the real-space position where the necessary electron-hole pairs are created.
To conclude, the there are some promising developments in the use of hematite as the photoanode material in photoelectrochemical devices.

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2. Valdes, A et al., J. Phys. Chem. C. 112, 9872 (2008)
3. Hellman, A et al., J. Phys. Chem. C 115, 12901 (2011)
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Biography: Anders Hellman received his PhD in theoretical physics in 2003 from University of Gothenburg, Sweden. Since then he has worked on various topics related to surface science, heterogeneous catalysis and materials for energy harvesting. He works as associate professor at Chalmers University of technology, Sweden, and is also associated with the Competence Centre for Catalysis, Sweden. His research interests range from automotive catalysis to plasmon-assisted water oxidation. His research portfolio includes charge transfer and non-adiabaticity in surface reaction, ammonia synthesis, CO and methane oxidation, thin oxides supported on metals, and photoelectrochemical studies of water oxidation.

Dr John R Littlewood
Cardiff Metropoltian University, UK

To be or not to be that is the question for quantitative and/or qualitative holistic building performance assessment

Abstract: There has been a rise in post occupancy evaluation (POE) of buildings in the UK since 2010, following numerous EU and UK research council grants and also the UK Technology Strategy Board's Building Performance Evaluation (BPE) scheme. The TSB BPE initiative has seen hundreds of domestic and non domestic buildings, their design teams and occupants assessed and monitored; using both quantitative and qualitative methodologies and finishes in 2014. One of the outcomes of these various initiatives funding schemes is a call for a 'light touch yet holistic' BPE methodology, which can be adapted to both new low and carbon neutral buildings and existing buildings being retrofitted with energy saving measures.
Research undertaken by Dr Littlewood on a number of BPE projects involving in-construction testing (iCT) using thermography (iCT:Th) during the construction process and the POE of low carbon dwellings led to the creation of the invited session 'assessment and monitoring the environmental performance of buildings' (AMEPB) at SEB'11 and the further enhancement at SEB'12. This presentation gives an overview of the dilemma on occasions facing researchers, practioners and scientists "To be or not to be that is the question for quantitative or qualitative holistic building performance assessment" and what this really means in practice, particularly using science and technology to deliver sustainable buildings. Hence the expansion of the AMEPB invited session into the Sustainable Building: Science and Technology general track launched at SEB'13.

Biography: John has studied, practised and lectured in the built environment since 1986 in both craft and professional roles, with a particular focus on sustainable housing, assessing and monitoring the thermal performance and occupant attitudes of and in dwellings, and also architectural technology. His PhD was entitled 'A study of the design and thermal performance of two-storey earth sheltered houses for the UK climate', which he completed in 2001. He is currently managing numerous EU & UK industry funded applied research projects developing methodologies for assessing environmental performance during and post construction of new and existing dwellings and also investigating end user energy demand and use and behaviour. Furthermore, he has been practising as a sustainability consultant and building performance evaluator with a number of housing associations since 2007. He co-

foundered and has led the Ecological Built Environment Research & Enterprise group (EBERE) and also the Professional Doctorate: Ecological Building Practices (DEBP) since 2009 at Cardiff Metropolitan University. He is supervising six DEBP students from the UK, South Africa and Canada. He is also supervising five PhD students from the UK, Abu Dhabi, Kuwait and Iran; having already supervised to completion two PhD projects and examined three PhDs and one MPhil research project.

John is always interested in developing collaborative projects with higher education organisations and industry and will be happy to be back in Morocco after 11 years; when he trekked to the top of Jebel Toubkal, in the Atlas Mountains in April 2002.

Prof Nacer Kouider M'Sirdi
Laboratoire des Sciences del'Information et des Systèmes, France

Different Models of HRES that can be used locally in mediterranean cities: A research point of vue

Biography: M'Sirdi Kouider Nacer is professor at Polytech Marseille and Aix Marseille University (AMU). He got the Phd in Electronics at INPG Grenoble (1983) and the Doctorat d'Etat in adaptive signal processing for non-stationary signals at the INPG, Grenoble, in 1988 (Laboratory of Automatic of Grenoble). He was assistant professor, in signal processing and automatic control, in University of Paris 6 in 1987 and Professor at University of Versailles in 1993 where he created a master specialised in Mechatronic of Robotic Systems (Option MSR in the DEA of Robotics). His research was done in the Laboratory of Robotics of Paris.
He was the dean of the research Laboratory of Robotics of Versailles (the LRV that he has created in 2000), from 2000 to 2004. From 2005 up to now, he is a research member of the LSIS (UMR CNRS 7296). His main research activities deal with adaptive and robust control, signal processing, diagnosis and observation for complex systems such as vehicles and robots.
In 2009 he has created the VSAS research project on Variable Structure Automatic Systems (SASV), for fundamental research in automatic control and optimization of Variable Structure Systems with commutations. The considered class of systems (VSAS) is multi components (using multiple connected models with commutations) involving exchanges between several parts of the system and the environment. This the case in one of vehicules and mobile systems application and also the case of Systems with Multiple Renewable Energy Sources. Applications of his research activities deal in one hand on vehicles and autonomous robots applications and in another hand on MACSyME project (Modeling Analysis and Control of Systems with Multiple Energy sources). Recently he has proposed to create the MERIE group (Mediterranean Efficient and Renewable Intelligent Energies) in the RMEI network. The aim of this group is to promote compatible and efficient renewable energies in merditerranean countries.

Dr Catalina Spataru
University College London, UK

Renewable Energy and Electricity Grid: WITH or WITHOUT fear of blackouts?

Abstract: The renewable energy use is increasing and in the future we will be looking at a completely different power grid. Sources such as solar and wind provide power intermittently and have actually made the system more delicate. In addition, more people will be driving electrical cars, energy which needs to be delivered by the power grid. We need a better understanding of power grid that can cope with intermittent conditions and find new ways to stabilize the power grid. Unfortunately, across the world, in many countries not enough has been done to address this problem. In the future, this could create more disruptions and potential for more frequent blackouts. If we look at US, electric supplies have usually been fairly efficient. However, when it comes to outages, the essential issue is whether we can get connected to the grid and whether you can island from the grid, in other words what it is linked with and not the type of power we use. Therefore, the main challenge to prevent such blackouts is having a self- constructive network that can synchronize spontaneously and recover from failures in real time, with fast respond. This presentation gives illustrations of blackouts cases which happened when power demand outstrips the capacity and when renewable energy (such as wind) was the main source in ending the blackout. Possible approaches which could help reduce both the frequency of blackouts and the cost of electricity and ways to handle the intermittent power sources of renewable energy to destabilize the network will be discussed.

Biography: Catalina's past and current research is interdisciplinary, being interested in practical research problems, which can inform policy decision makers. Her main research interests are in the technical and economic integration of renewable energy alongside energy efficiency in dynamic energy systems, security of supply and prevention of electricity blackouts, smart super grids. Her background is in mathematics and physics, but her research is interdisciplinary in nature and she collaborates closely with experts from different disciplines: medicine, mathematics, electrical engineering, economics, political science, social science.

Prof Fernando Tadeo
University of Valladolid, Spain

Osmotic Energy: a promising renewable energy source

Abstract: Osmotic Energy is a renewable energy technology based on exploiting the chemical differences between liquids with different concentrations of salts. It has been successfully developed during the last decades, with one pilot plant already in operation in Norway, based on the Pressure Retarded Osmosis (PRO) concept. The potential of using Osmotic (also known as Salinity Gradient) Energy worldwide, as a continuous renewable energy source will be discussed, showing how these membrane-based systems could transform the osmotic energy of seawater into electricity, as long as there is an abundant source of low-salinity water, from a nearby river or wastewater treatment plant.

Biography: Fernando Tadeo is Professor of the School of Engineering at the University of Valladolid since 2010. He graduated from the same university, in Physics and in Electronic Engineering. After completing an M.Sc. in Control Engineering in the Univ. of Bradford, U.K., he got his Ph.D. from the Univ. of Valladolid. His main interest area is Advanced Process Control, focused on applications in Desalination and Renewable Energies (Wind, Solar and Osmotic).

Prof Anastasia Zabaniotou
University of Thessaloniki, Greece

Biomass Thermochemical Technologies and Biorefineries

Abstract: Biomass solids can be converted to liquid and gaseous biofuels in a variety of processes. A crucial step in developing the bio-industry is to establish integrated bio-refineries that are capable of efficiently converting a broad range of biomass feed stocks into commercially viable biofuels, biopower, and other bioproducts.
Integrated bio-refineries are similar to conventional refineries in that they produce a range of products to optimize both the use of the feedstock and production economics. Integrated bio-refineries use novel technologies and diverse biomass feedstocks, requiring significant investments in research, development, and deployment to reduce costs and improve performance to achieve competitiveness with fossil fuels.
There are many types of non-food sources (organic matter such as plants, residue from agriculture and forestry, the organic component of municipal and industrial wastes, algae and other micro-organisms that can now be used to produce fuels, chemicals, and power. This flexibility in feedstock has resulted in increased use of biomass technologies.
The technological development on energy production from biomass focuses for higher efficiently of processing complex feed stocks. Decentralized electricity production is likely to play an important role in future energy supply.
For Mediterranean Countries, facilities utilizing indigenous renewable sources and designed to supply local communities and decentralized energy users are in the forefront of energy and environmental policies. The approach of biomass energy utilization very close or at the place of origin minimizing transportation and logistics cost provides a means of boosting sustainable development in rural areas. Agricultural and forestry activities incorporation in energy production sector enhances the potential of decentralized energy market creation bio-businesses in rural areas.

Biography: Anastasia Zabaniotou is Prof. at the Chemical Engineering Dept. of the Faculty of Engineering of University of Thessaloniki, Greece and member of the Board of the centre for sustainable development of the Aristotle University. She holds a Ph.D. from Ecole Centrale de Paris and has been working for 4 years in the European Commission in DG research. For the 10 last years she is the leader of the Biomass and Waste Group of AUTh, which carries out fundamental and applied research in cooperation with several public and private organizations in the field of renewable energy production, with emphasis in biomass and waste valorisation by using

innovative technologies of fast and slow pyrolysis, high temperature fixed and fluidized bed gasification and in topics of green chemistry and biorefinery. Group's mission is to stimulate and promote know how and innovative solutions that meet the specific technological needs of the Greek and European bio-energy and waste management companies. She has been involved in more than 25 national and international research projects. She is author and co-author of more than 75 papers in international journals and more than 100 conference presentations.

Conference Schedule

	Sunday 16 June 2013	
18.00 - 20.00	Early Registration and welcome reception	

	Monday 17 June 2013	
8.00	Registration & Networking	
9.30-10.30	Conference Opening and Welcome	Dr Abdulaziz Othman Altwajiri, Director General of ISESCO Prof Serghini Farissi, President of University Sidi Mohammed Ben Abdellah, Fes Prof Ali Sayigh, Chairman of World Renewable Energy Congress Prof Robert J. Howlett, Executive Chair, KES International Dr Osman Benchikh, UNESCO Prof Driss Aboutajdine, Head of CNRST, Morocco
10:30-11.00	Coffee & Networking	
11:00-11.45	Invited Keynote Talk	Ali Sayigh -- Solar and Wind Energy will supply 50% of Global Electricity by 2030
11.45-12.30	Invited Keynote Talk	Osman Benchikh -- The UNESCO Programme in Sustainability and Renewable Energy
12:30-13.30	Lunch	
13.30-14.15	Invited Keynote Talk	Andrew Geens -- Energy Efficiency - The new.....Energy Efficiency
14.15-15.00	Invited Keynote Talk	Rainer Hinrichs-Rahlwes -- Renewable Energy for secure energy supply and climate protections - Experience from Europe and Germany in the global context
15:00-15.30	Coffee & Networking	
15.30-18.10	Session M1	IS01a: Buildings Energy Performance in the Mediterranean area Chair: Brahim Benhamou, Cadi Ayyad

		University, Marrakech
15.30-17.30	Session M2	IS02: Impact of innovative integrated solar technologies on the energy performance of buildings. Chair: Antonio Gagliano
15.30-17.30	Session M3	IS03: Improving Building Energy and Environmental Assessment Rating Chair: Emeka Osaji
15.30-17.30	Session M4	IS07: Smart Technologies for Renewable Energy Chair: Nader Anani
18.00	Sessions close	
Evening	Free	

	Tuesday 18 June 2013	
8:00-9.00	Registration & Networking	
9:00-9.45	Invited Keynote Talk	Ahmed Ennaoui -- Thin-film Photovoltaic Technology: The Coming Decade of Opportunity
9.45-10.30	Invited Keynote Talk	John Littlewood -- To be or not to be that is the question for quantitative and/or qualitative holistic building performance assessment
10.30-11.00	Coffee & Networking	
11:00-13.00	Session T1	GT01a: Direct Solar Chair: Rainer Hinrichs-Rahlwes
11:00-13.00	Session T2	GT02a: Sustainable Building: Science and Technology Chair: John Littlewood
11:00-13.10	Session T3	IS01b: Buildings Energy Performance in the Mediterranean area Chair: Brahim Benhamou, Cadi Ayyad University, Marrakech
11:00-13.00	Session T4	IS10a: Solar Energy Harvesting Chair: Mahieddine Emziane
13:00-14.00	Lunch	
14:00-14.45	Invited Keynote Talk	Anne Håkansson -- Environmental Impact Assessment - Assess for Sustainability
14:45-15.30	Invited Keynote Talk	Jazaer Dawody -- Fuel Cell based Auxiliary Power Units (FC-APU) for power generation in trucks with reduced CO2 release and sub-zero pollutant emissions
15.30-16.00	Coffee & Networking	
16.00-18.00	Session T5	GT01b: Direct Solar Chair: Rainer Hinrichs-Rahlwes
16.00-18.00	Session T6	GT02b: Sustainable Building: Science and Technology Chair: John Littlewood
16.00-18.00	Session T7	IS10b: Solar Energy Harvesting Chair: Mahieddine Emziane

18.00	Sessions close	
Evening	Free	
	Wednesday 19 June 2013	
8:00-9.00	Registration & Networking	
9.00-9.45	Invited Keynote Talk	Mark Barrett -- Integrating buildings into energy systems
9.45-10.30	Invited Keynote Talk	Fernando Tadeo -- Osmotic Energy: a promising renewable energy source
10:30-11.00	Coffee & Networking	
11:00-13.00	Session W1	GT02c: Sustainable Building: Science and Technology Chair: John Littlewood
11:00-13.00	Session W2	GT05a: Wind and Ocean Energy Conversion Chair: Fernando Tadeo
11:00-13.00	Session W3	GT06a: Smart Energy Technologies Chair: Catalina Spataru
11:00-13.00	Session W4	IS09: Monitoring, diagnosis and evaluation of Photovoltaic Systems Chair: Ali Tahri
13:00-14.00	Lunch	
14:00-14.45	Invited Keynote Talk	Catalina Spataru -- Renewable Energy and Electricity Grid: WITH or WITHOUT fear of blackouts?
14.45-15.30	Invited Keynote Talk	Anders Helman -- Hematite, a promising photoelectrochemical material
15:30-16.00	Coffee & Networking	
16:00-18.00	Session W5	GT05b: Wind and Ocean Energy Conversion IS06: Novel Converters for Ocean Energy Chair: Fernando Tadeo
16:00-18.00	Session W6	GT06b: Smart Energy Technologies Chair: Catalina Spataru
16:00-18.00	Session W7	GT03: Novel Technologies Chair: Jazaer Dawody GT04: Bioenergy Technologies Chair: Anastasia Zabaniotou, Aristotle University of Thessaloniki, Greece
16:00-18.00	Session W8	Mediterranean Renewable Energy Cup (MedRECup)
18.00	Sessions close	

19:30	Conference Dinner	

	Thursday 20 June 2013	
8:30-9.00	Registration & Networking	
9:00-9.45	Invited Keynote Talk	Anastasia Zabaniotou -- Biomass Thermochemical Technologies and Biorefineries
9.45-10.30	Invited Keynote Talk	Yasser Gaby Dessouky -- Renewable Energy and Energy Efficiency Policies
10.30-11.00	Coffee & Networking	
11:00-13.00	Session H1	WS01a: Mediterranean Efficient Renewable Intelligent Energies Chairs: Nacer Kouider M'Sirdi and Aziz Naamane
11:00-13.00	Session H2	IS04a: Renewables in Algeria -- Messaouda Azzouzi
11:00-13.00	Session H3	IS08a: Power Electronics -- Kouzou Abdellah
13:00-14.00	Lunch	
14:00-14.45	Invited Keynote Talk	Nacer Kouider M'Sirdi -- Title to Follow
14.45-15.30	Invited Keynote Talk	
15.30-16.00	Coffee & Networking	
16:00-18.00	Session H5	WS01b: Mediterranean Efficient Renewable Intelligent Energies Chairs: Nacer Kouider M'Sirdi and Aziz Naamane
16:00-18.00	Session H6	IS04b: Renewables in Algeria -- Messaouda Azzouzi
16:00-18.00	Session H7	IS08b: Power Electronics -- Kouzou Abdellah
18.00	Conference close	

Paper Presentations

MONDAY 17 JUNE: 15.30-17.30

M1: Session IS01a: Buildings Energy Performance in the Mediterranean area
Chair: Brahim Benhamou, Cadi Ayyad University, Marrakech
15.30-18.10

Energy Performances of a Passive Building in Marrakech: Parametric Study
Brahim Benhamou, Amin Bennouna

Nearly Zero Energy Buildings. Application in Mediterranean hotels
Theocharis Tsoutsos

The energy balance behavior in streets of different geometry
Moufida Boukhabla, Djamel Alkama, Noureddine Moummi

Identification of thermal characteristics of a building
Toufik Bouache, Walter Bosschaerts, Stephane Ginestet, karim Limam, Guilherme Lindner

A case study of Energy Efficiency Retrofit in social housing units
Antonio Gagliano, Francesco Nocera, Francesco Patania

The identification of the environment disposal of the traditional Algerian houses
Sabrina Kacher

Energy qualification in buildings. The effect of changes in construction methods in the Spanish A4 climate zone
Xavier Lastra-Bravo, Víctor Fernández-Membrive, Isabel Flores-Parra, Alfredo Tolón-Becerra

Study of thermal comfort quality of a passive solar building in Tunis
D Yosr Boukhris

M2: Session IS02: Impact of innovative integrated solar technologies on the energy performance of buildings.
Chair: Antonio Gagliano

New patented solar thermal concept for high building integration: Test and modelling
Gilles Notton, Dr Jean Louis Canaletti, Christian Cristofari, Fabrice Motte

Photovoltaic glazing: analysis of thermal behavior and indoor comfort
Giuseppe Tina, Antonio Gagliano, Francesco Nocera, Francesco Patania

Historic buildings in Mediterranean area and solar thermal technologies: architectural integration vs preservation criteria
Angela Moschella, Maurizio Detommaso, Alessandro Lo Faro, Azzurra Privitera, Angelo Salemi, Giulia Sanfilippo

M3: Session IS03: Improving Building Energy and Environmental Assessment Rating
Chair: Emeka Osaji

An assessment of low energy design practices in housing retrofit projects
Mohamed Osmani, Philip Davies

Solar System and Ground Heat Exchanger at Bragadiru Passive House – Amvic Office Building
Ruxandra Crutescu, Viorel Badescu, Mihai Ceacaru, Alexandru Tudor

Influence of phase change materials on the inertia of wall buildings
Abdelaziz Oubarra, Bouchra Abouelkhayrat, Hamid Hamza, Jawad Lahjomri

M4 Session IS07: Smart Technologies for Renewable Energy
Chair: Nader Anani

High Speed Generator for Turbocharger based Domestic Combined Heat and Power Unit Employing the Inverted Brayton Cycle
Bashar Zahawi, Bobby James

Location Based Security for Smart Grid Applications
Bamidele Adebisi, Bahram Honary, Eraj Khan

Maximum Efficiency or Power Tracking of Stand-Alone Small Scale Compressed Air Energy Storage System
Vorrapath Kokaew, Suleiman Sharkh, Mohamed Torbati

A CAD Package for Modeling and Simulation of PV Arrays under Partial Shading Conditions
Nader Anani, Omar Al-kharji, Joao Ponciano, Mohd Shahid

A Novel Algorithm for Demand Reduction Bid based Incentive Program in Direct Load Control
Essam Al-Ammar, Imthias Ahamed, Muhammad Babar, Aqueel Shah

TUESDAY 18 JUNE: 11.00-13.00

T1: Session GT01a: Direct Solar
Chair: Rainer Hinrichs-Rahlwes

MPPT with Inc.Cond method using conventional interleaved boost converter
Zahra Mirbagheri, Saad Mekhilef, Mohsen Mirhassani

Estimation of tilted solar irradiation using Artificial Neural Networks
Gilles Notton, Said Diaf, Christophe Paoli

Solar Tracking with Photovoltaic Panel
Student Lalia Miloudi, Dalila Acheli, Ahmed Chalb

Evaluation of the Moroccan Power Grid Adequacy with introduction of Concentrating Solar Power (CSP) using solar tower and parabolic trough mirrors technology
Mohamed Oukili, Mohamed El hafyani, Taoufik Ouchbel, Mohammed Seddik, François Vallée, Smail Zouggar

A Non linear control technique used for photovoltaic water pumping System
Azeddine Draou, Abdelaziz Al Ghonamy, Ridha Andoulssi, Houssem Jerbi, Brahim Khiary

PV System Performance and the Potential Impact of the Green Deal Policy on Market Growth in London, UK
Trevor Sweetnam, Mark Barrett, Billy Cliffen, Catalina Spataru, Spyridon Zikos

T2: Session GT02a: Sustainable Building: Science and Technology
Chair: John Littlewood

Opportunities in Spanish energy efficiency. Current situation, trends and potential in the building sector
Alfredo Tolón-Becerra, Víctor Fernández-Membrive, Isabel Flores-Parra, Xavier Lastra-Bravo

Granular cork content dependence of thermal diffusivity, thermal conductivity and heat capacity of the composite material / Granular cork bound with plaster.
Abou-bakr Cherki, Dominique Baillis, Abdelhamid Khabbazi, Benjamin Remy

Heat transfer analysis of the transpired solar façade
Hoy-Yen Chan, Saffa Riffat, Jie Zhu

Quantitative Evaluation of the Performance of a Wind Tower for a Natural Ventilation and a Passive Cooling in the Hot and Semi Areas Arid Case of Study Ouled Djellal in Algeria
Said Mazouz, Torkia Assil

T3: Session IS01b: Buildings Energy Performance in the Mediterranean area
Chair: Brahim Benhamou, Cadi Ayyad University, Marrakech
11.00-13.10

Methods and results of experimental researches of thermal conductivity of soils
Tetiana Nikiforova, Limam Karim, Savytskyi Mykola, Belarbi Rafik, Bosschaerts Walter

Calculation of indoor convective heat transfer coefficients under forced convection in buildings. Approximating 3D models from 2D equivalent models
Alejandro Rincón Casado, Enrique Ángel Rodríguez Jara, Ismael Rodríguez Maestre, Francisco José Sánchez de la Flor

A comparative analysis of the energy performance of traditional wooden shutters and contemporary aluminium roller shutters in Istanbul
Fatih Yazicioglu

Numerical simulation of heat transfers in a room in the presence of a thin horizontal heated plate
Lahcen Boukhattem, Hassan Hamdi

Fault Detection Analysis of Building Energy Consumption Using Data Mining Techniques
Imran Khan, Alfonso Capozzoli, Stefano Corgnati, Cerquitelli Tania

Thermal characterization of a Tunisian gypsum plaster as construction material
Sadok Ben Jabrallah, Mohammed Ben Mansour, Brahim Benhamou, Amel Soukaina Cherif

T4: Session IS10a: Solar Energy Harvesting
Chair: Mahieddine Emziane

In situ Study Tracker Parabolic Solar Concentrator and compare with Solar Flux
Mohammed Bensafi, Belkacem Draoui, Mohammed Hasnat, Noureddine Kaid, Boudjamaa Ouradj

Design, realization and optimization of the photovoltaic systems
Kassmi Khalil, Baghaz El Hadi, Yaden Faysal, Mahroug Kamal, Melhaoui Mustapha

Latitude Based Model for Tilt Angle Optimization for Solar Collectors in the Mediterranean Region
Driss Lahjouji, Hassane Darhmaoui

Design and realization of an autonomous PV system equipped with a regulator of charge/dischargeand digital MPPT command
Kassmi Khalil, Baghaz ElHadi, Yaden Faysal, Hirech Kamal, Melhaoui Mostapha

Improvement In Perturb and Observe Method Using State Flow Approach
Rana Ahmed, Aziz Naamane

TUESDAY 18 JUNE: 16.00-18.00

T5: Session GT01b: Direct Solar
Chair: Rainer Hinrichs-Rahlwes

Estimation of Global Solar Radiation Using Three Simple Methods
Abdelhak Ben Jemaa, Najib Essounbouli, Abdelaziz Hamzaoui, Faicel Hnaien, Souad Rafa, Farouk Yalaoui

Multi-technologies photovoltaic pilot plant of 12.5KWp connected to the grid at UDES, Algeria
Achour Mahrane, Fethi Akel, Douadi Bendib, Ingénieur Zouheir Boudeheb, Madjid Chikh, Mohamed Laour

A comparative study of three topologies of inverter three-phase (5L) for a PV system
Abdelaziz Fri, Rachid El bachtiri, Abdelaziz Elghzizal

Sustainable Industrial Growth in Turkey & An assessment of the EU's Carbon Dioxide Emissions
Erhan Atay

Modeling of photovoltaic pumping system using centrifugal pump and DC motor
Sarah Abdourraziq and Rachid EL Bachtiri

T6: Session GT02b: Sustainable Building: Science and Technology
Chair: John Littlewood

Modelling and optimisation in terms of CO2 emissions of a solid oxide fuel cell based micro-CHP system in a four bedroom house in London
Alexandros Adam, Dan Brett, Eric Fraga

Thermal properties of a sample prepared using mixtures of clay bricks
Laaroussi Najma Najma, Khabbazi Abdelhamid Abdelhamid, Cherki Aboubaker Aboubaker, Feiz Amir Amir, Garoum Mohammed Mohammed

Feedback from occupants in 'as designed' low carbon apartments, a case study in Swansea, UK,
Masoudeh Nooraei, Nick Evans, John Littlewood

Compact cities as a response to the challenging local environmental constraints in hot arid lands of Algeria
Ammar Bouchair, Mustapha Blibli, Amar Hammouni, Med Cherif Lehtihet, Hocine Tebbouche

T7: Session IS10b: Solar Energy Harvesting
Chair: Mahieddine Emziane

Optical transmission enhancement of Fluorine doped Tin Oxide (FTO) on glass for thin film photovoltaic applications
Farsad Chowdhury, Thomas Blaine, Adel Gougam

Performance Analysis of Rooftop PV Systems in Abu Dhabi
Mona Al Ali, Mahieddine Emziane

Design of Si/Ge Dual Junction Solar Cell Devices
Sara Alshkeili, Mahieddine Emziane

Modeling and Simulation of a Thermophotovoltaic System with NaF Heat Storage
Mohamed Al Hosani, Mahieddine Emziane

Tecnoeconomic Analysis of Medium and Large-Sacle Desalination Plants Driven by Concentrated Solar Systems in the Mena Region
Abdel Hakim Hassabou, Wolfgang Polifke, Markus Spinnler

WEDNESDAY 19 JUNE: 11.00-13.00

W1: Session GT02c: Sustainable Building: Science and Technology
Chair: John Littlewood

The Evaluation of a palette of Low Carbon Measures applied to a Conservation Area Victorian Terraced House
Jon Moorhouse, John Littlewood

Hybrid Green Technologies for Retrofitting Heritage Buildings in North African Medinas: Combining vernacular and high-tech solutions for an innovative solar powered lighting system for hammam buildings
M Sibley, M Sibley

Building Energy Consumption Modeling with Neural Ensembling Approaches for Fault Detection Analysis
Fiorella Lauro, Alfonso Capozzoli, Stefano Pizzuti

Design Philosophy of the traditional Kuwaiti house
Mohammad Alhazim, Keireine Canavan, Paul Carey, John Littlewood

W2: Session GT05a: Wind and Ocean Energy Conversion
Chair: Fernando Tadeo

Investigation of Electricity Generation from Wind Energy in Malacca, Malaysia
M.R. Islam, S. Mekhilef, R. Saidur

Power Control of Wind Turbine based on Fuzzy Controllers
Abdel Ghani Aissaoui, Mohamed Abid, Najib Essounbouli, Frederic Nollet, Ahmed Tahour

Fuzzy Predictive Control of a Variable Speed Wind Turbine
Bououden Sofiane, Chadli Mohammed, Filali Salim

Model based design of wind energy systems
Ingénieur Jamila Elhaini, PH mohammed Radouani, PES Abdelmjid Saka

W3: Session GT06a: Smart Energy Technologies
Chair: Catalina Spataru

HPLEMS: Hybrid Plug Load Energy Management Solution
Sunil Vuppala, Kiran HS

SWITCH: Case studies in the demand side management of washing appliances
Rob Shipman, Mark Gillott, Eldar Naghiyev

A Highly Configurable Simulator for Assessing Energy Usage
Naveed Arshad, Usman Ali, Fahad Javed

Intelligent Control of Renewable Holonic Energy Systems
Fouzia Ounnar, Nacer-Kouider M'Sirdi, Aziz Naamane, Patrick Pujo

W4: Session IS09: Monitoring, diagnosis and evaluation of Photovoltaic Systems
Chair: Ali Tahri

PV power plant for decentralized suply of electricity
Abdelkader Outzourhit, Amine Elfathi

Competing risk of degradation processes of a photovoltaic system under several conditions
Iberraken Fairouz, Aissani Djamil, Medjoudj Rabah

Performance assessment of different roof integrated photovoltaic modules under Mediterranean Climate
Marco D'Orazio, Elisa Di Giuseppe, Costanzo Di Perna

Monitoring and evaluation of photovoltaic system
Ali Tahri, Azzedine Draou, Takashi Oozeki

Sustainable development by Sahara Solar Breeder plan: Energy from the desert of Algeria
Amine Boudghene Stambouli, Hideomi Koinuma

WEDNESDAY 19 JUNE: 16.00-18.00

W5: Session GT05b: Wind and Ocean Energy Conversion and IS06: Novel Converters for Ocean Energy
Chair: Fernando Tadeo

Wind power systems: environmental aspects and impacts
Louiza haddad, Zeroual Aouachria

Evaluation of the Potential of Osmotic Energy as Renewable Energy Source in Realistic Conditions
Khaled Touati, Schiestel Thomas

Fault detection and isolation in DFIG driven by a wind turbine with a variable rotor resistance
Hakim Ouyessaad, Houcine Chafouk

W6: Session GT06b: Smart Energy Technologies
Chair: Catalina Spataru

Storage in energy systems
Mark Barrett, Catalina Spataru

A New VSAS approach for Maximum Power Tracking for Renewable Energy Sources (RES)
Nacer M'Sirdi, Mouna Abarkan, Abdelhamid Rabhi

W7: Session GT03: Novel Technologies
Chair: Jazaer Dawody

Energy analysis of single effect absorption chiller (LiBr/H2O) in an industrial manufacturing of detergent
Chougui Mohamed Lamine, Zid Said

Proton conductivity of Nafion membrane in actual direct methanol fuel cell operation
Chaiwat Prapainainar, Stuart Holmes

W7: Session GT04: Bioenergy Technologies
Chair: Anastasia Zabaniotou, Aristotle University of Thessaloniki, Greece

Biofuel: policy, standardization and recommendation for sustainable future energy supply
Mofijur Rahman, Shahabuddin Ahmmad, Masjuki Hassan, Abul Kalam

A Study of Wear Properties of Different Soybean Oils
Kraipat Cheenkachorn

Evaluation of techno-economic feasibility biomass-to-energy by using ASPEN Plus: A case study of Thailand
Phavanee Narataruksa, Piyapong Hunpinyo

W8: Mediterranean Renewable Energy Cup (MedRECup)

Chargeur solaire à port USB
Lahlou Houda, Karim Karima, Rachidi Fatim Ezzahra, Mehdaoui Khadija, Laanaya Alae

Commande de l'éclairage par la technologie des Courants Porteurs en Ligne.
El Fellahi Hassan (Chef de groupe), Moubarik Yassine, Miquas Oussama, Salama Jihad, Marzaq Hafida

Contrôleur des consommations électriques
BRAHMI Amine, IDRISSI Mohammed, ZATTI Mohamed, CHABBAR Houria

Réalisation d'un panneau publicitaire autonome et intelligent
Mama Yassine, El Bahaoui Abdelmajid, Oudra Wassim, Boukhris Mohamed Ayoub.

Chauffe-eau et chauffage solaire à système photovoltaïque intégré
Boukdir Youssef, El Omari Hamid

THURSDAY 20 JUNE: 11.00-13.00

H1: Session WS01a: Mediterranean Efficient Renewable Intelligent Energies
Chairs: Nacer Kouider M'Sirdi and Aziz Naamane

Optimization of Hybrid Renewable Energy Resources Using PSO for Cost Reduction
Motaz Amer

Adaptive Sliding Mode Observer for estimation of State of Charge
Belhani Ahmed, Naamane Aziz, M'sirdi Nacer Kouider

Analysis of Energy Consumption for a Building using Wind and Solar Energy Sources
Abarkan Mouna, Naamane Aziz, Errahimi Fatima, M'Sirdi Nacer Kouider

Maximum power point tracking using P&O control optimized by a neural network approach: a good compromise between accuracy and complexity
Mohamed Aymen Sahnoun, Jean-Claude Carmona, Julien Gomand, Héctor Manuel Romero Ugalde

H2: Session IS04a: Renewables in Algeria
Chair: Messaouda Azzouzi

Technical and economic assessment of wind farm power generation at Adrar in Southern Algeria
Said Diaf, Djamila Diaf, Gilles Notton

Feasibility Study of Parabolic trough Solar Power Plant under Algerian Climate
Abdou Messai, Younes Benkedda, Mohammed Benzerga, Sofiane Bouaichaoui

Assessment of a solar parabolic trough power plant for electricity generation under Mediterranean and arid climate conditions in Algeria
Mohamed Abbas, Aburidah Hanane, Kasbadji Merzouk Nachida, Belgroun Zoubir

Field Diagnostic Testing of Current Transformers Using Modern Techniques
Mohamed Bouchahdane, Messaouda Azzouzi, Aissa Bouzid

H3: Session IS08a: Power Electronics
Chair: Kouzou Abdellah"

Performance of wind energy conversion systems using a cycloconverter to control a doubly fed induction generator
Abderraouf Boumassata, Nedjoua Bennecib, Naim Cherfia, Djallel Kerdoun

Nine-to-Three Phase Direct Matrix Converter with Model Predictive Control for Wind Generation System
Omar Abdel-Rahim, Haitham Abu-Rub, Abdellah Kouzou

Control of a PMSG Based Wind Energy Generation System for Power Maximization and Grid Fault Conditions
Youssef Errami, Mohamed Maaroufi, Mohammed Ouassaid

Development and Realization of an Intelligent Power Strip for Energy Consumption Management in Hybrid Wind/Photovoltaic Systems
Souad Rafa, Said Diaf, Fouad Khenfri

THURSDAY 20 JUNE: 16.00-18.00

H5: Session WS01b: Mediterranean Efficient Renewable Intelligent Energies
Chairs: Nacer Kouider M'Sirdi and Aziz Naamane

Minimization of the Operation Costs of a Solar/Gas Air-conditioning System using Duration-based Predictive Control
Johanna Salazar, Maria del Mar Castilla, Francisco Rodriguez, Fernando Tadeo

Concentrating Solar Power Using Parabolic Trough, Pilot Project at the Islamic University of Gaza
Yunes Mogheir

H6: Session IS04b: Renewables in Algeria
Chair: Messaouda Azzouzi

Sliding Mode Control of a variable speed wind power generation with DFIG
Kerrouche Kamel, Mezouar Abdelkader

Decoupled Control of Doubly Fed Induction Generator by Vector Control for Wind Energy Conversion System
Djamel Kerrouche kamel

PWM Converters and Its Application To The Wind-Energy Generation
Adel Mehdi, Hocine Benalla, Abdelmalek Boulahia, Houssam Medouce, Fateh Mehazzem, Salah Eddine Rezgui

H7: Session IS08b: Power Electronics
Chair: Kouzou Abdellah

Characterization and Control of Supercapacitors Bank for Stand-Alone Photovoltaic Energy
Nabil Benyahia, Nacereddine Benamrouche, Mustapha Bouheraoua, Hakim Denoun, Salah Tamalouzt, Mustapha Zaouia

A Comparison Between Static and Dynamic Performances of a Z-source and a Dual-Stage Boost Converter Under SMC for PV Energy Applications
Abdelali El Aroudi, Cid-Pastor A, Kouzou Abdellah, Reham Haroun, Luis Martinez Salamero

Energy and power quality efficiency of a new three cell inverter structure
Kelaiaia Mounia Samira, Hocine Hocine, Kelaiaia Samia, Mesbah Tarek

Efficient conversion of solar energy by a new multi-cells inverter structure applied in isolated mode
Labar Hocine, Kelaiaia Mounia Samira, Kelaiaia Samia, Mesbah Tarek