Meeting of
The Mechanical & Manufacturing Division of Engineers Ireland
&
The Republic of Ireland Region of The Institution of Mechanical Engineers

An Evening with National & International Experts on Sustainable Energy

In co-operation with the 5th International Conference on Sustainable Energy and Environmental Protection (SEEP)

18:30, Wednesday June 6th 2012
Engineers Ireland, 22 Clyde Road, Dublin 4

Evening Introduction

We have selection of speakers covering areas including Irish policy directions, biomass based fuel additives, smart energy systems, solar energy and hydrogen & fuel cells.

Talks begin at 18:30, running in short sections, with a question & answer sessions after a short break. Attendees will have opportunities for informal discussion over tea & coffee with the speakers, organisers and other attendees

Speaker & Presentation Summaries

Speaker - Prof. Michael H.B. Hayes

Prof. Hayes MRIA is the leader of the Carbolea research group at the University of Limerick. With degrees from UCD (BAgrSc) Cornell (MS) & Ohio State University, he taught & researched in the Chemistry Dept., Uni. of Birmingham before coming to University Of Limerick as a research Professor. His major interest is in Second Generation Bio-refining. He was elected to Honorary Memberships of IHSS, SSSA, and ASA.

Presentation Summary - Platform Chemicals and Fuel Additives from Lignocellulosic Biomass

The use of food crops to produce fuels is not sustainable; interest must focus on organic wastes and lignocellulose materials for the production of liquid fuels, fuel additives, and platform chemicals.

Speaker - Prof. J Owen Lewis

Prof. Lewis qualified as an architect, building services engineer & energy technologist and practised professionally in Ireland & Zambia. As UCD's former Dean of Engineering & Architecture, Principal of UCD's College of Engineering, Mathematical & Physical Sciences and Emeritus Professor of Architectural Science, he has taught in Ireland, Jordan, & USA and lectured in most EU member states. He was responsible for co-ordinating many European Commission energy research & dissemination activities and has held positions as Bord-na-Mona's Director for Innovation & R&D and Chief Executive of the Sustainable Energy Authority of Ireland

Presentation Summary - Sustainable Energy for Ireland: Challenge and Opportunity

Ireland currently imports 89% of our primary energy needs; dependence on imports risks our security of supply and makes us vulnerable to price volatility. By improving the efficiency of our energy use - Ireland is implementing ambitious efficiency programmes in buildings & industry – and developing indigenous sources of energy - onshore wind energy potential represents more than 120% of our electricity demand - we have the opportunity to reduce dependence on imports and prepare for a low carbon future.

Speaker- Prof. Noam Lior

Prof. Lior has 44 years' of experience in energy/power & water desalination research and over 350 technical publications in the fields of energy, desalination, heat transfer, thermodynamics & fluid mechanics. He is a Fellow of the American Society of Mechanical Engineers, Associate Fellow of the American Institute of Aeronautics and Astronautics, Professor at University of Pennsylvania, Department of Mechanical Engineering and Applied Mechanics, Philadelphia. He is a member of the many international groups promoting management, international-studies and environmental-leadership and has held the position of director & chairman on many societies & divisions for sustainable energy development. He has held editorial positions on eight international energy, desalination and thermal-science journals over two decades.

Presentation Summary - Sustainable Energy Development: The Present Situation and Possible Paths to the Future

Recent forecasts of energy-resources & uses, their economic, environmental & social sustainability and recent "game-changing" events - the postponement of "peak-oil", nuclear power's future following the disaster in Japan - are leading some to conclude we are running out of environment faster than resources. Others conclude that recent fluctuations in oil & gas prices are unrelated to supply & demand effects and strongly impede discovery of effective ways for curbing energy demand and meeting energy needs. Sustainability's emergence as a science must be developed and applied to provide analysis and evaluation tools. Prof. Lior will present his views on promising energy R&D areas, their potential and foreseen improvements.

Speaker - Prof. Henrik Lund

Prof. Henrik Lund, M.Sc.Eng., Ph.D., is the Dr.Techn. Professor in Energy Planning at Aalborg University, Denmark and Editor-in-Chief of Elsevier International Journal Energy.

Presentation Summary - From Electricity Smart-Grids to Smart Energy Systems

The utilization of renewable energy conversion to other carriers (including heat & biofuels), combined with energy conservation & efficiency improvements, has the potential to replace fossil fuels and improve fuel efficiency. However, these activities contribute to electricity balancing problems & excess electricity production. Combined with the problem of integrating fluctuating power from renewable energy sources, the use of smart grids should be seen as a means of approaching sustainable energy systems. This presentation also emphasises the inclusion of flexible CHP production in electricity balancing & grid stabilization and presents highlights from recent developments in the Danish electricity market.

Speaker – Prof. Brian Norton

Prof. Norton is President of the Dublin Institute of Technology and holds doctorates from Cranfield University and the University of Nottingham. He is a Fellow of the Energy Institute, Engineers Ireland and Irish Academy of Engineering and been awarded the Napier Shaw Medal of the Chartered Institute of Building Services Engineers and the Roscoe Award of the Institute of Energy. He is an Honorary Fellow of the Chartered Institute of Building Services Engineers and Honorary Professor at Universities in the U.K. and China.

Presentation Summary - Solar Energy

More solar energy falls on the earth in one minute than humans currently consume in energy conversion processes in one year. Despite this, the technological utilisation of solar energy has challenges achieving economic viability due to low conversion efficiencies, low power density and inefficient energy storage. The challenges are increasingly being overcome in both photovoltaic and thermal systems through new systems & components, adoption of advanced materials, manufacturing economies of scale and better design for ease of installation & integration. These developments will be discussed with a view as to likely medium-to-long-term future innovations.

Speaker - Dr Abdul Ghani Olabi

Dr. Olabi is a senior lecturer in the Dublin City University's School of Mechanical & Manufacturing Engineering and is chairman & founder of SEEP. Having graduated from Damascus University, he achieved his Masters Degree & PhD at DCU. He worked in R&D for 4 years after graduation before spending a number of years at HIAST (Higher Institute of Applied Science & Technology), Damascus. He has also worked at FIAT's research centre, developing new generations of feeding & injection components. His research interests are in the areas of transportation, CAD & Design and Sustainable Energy with specific interest in hydrogen & fuel-cell, bio-fuel, wind and solar energy technologies. With over 100 technical publications, he is a subject editor for Elsevier's Energy Journal and is on the editorial board of other journals.

Presentation Summary - Hydrogen, Fuel Cell & Biomass Developments

Dr. Olabi's presentation deals with the design and continuing development of Proton Exchange Membrane (PEM) fuel cells, SOFC & Anaerobic Digestion (AD) of organic material and will present the opportunities & obstacles for their future commercialisation. He will focus on AD's potential, the controversy surrounding the use of agricultural land to produce energy instead of food & consequent price impacts on food crops. Algae have the advantage of not directly competing with food industry while still being appropriate for bioenergy. New technological approaches are been developed to increase the yield of biogas produced from biomass via AD, involving mechanical pre-treatment of the biomass to increase its surface area exposed to the process.

There is no charge for this lecture and it is open to the public. Registration is required, please email Paul Dillon Paul.Dillon@ittdublin.ie

The address will have complimentary tea & coffee where the attendees will have the opportunity for further discussion.

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