

Levelised Costs of Renewable Energy: What if costs continue to drop?

Recent developments and policy implications up to 2015

Invitation only workshop jointly organised by IRENA and IEA-RET D

Friday 26 October 2012, Robert-Schuman-Platz 3, Bonn (BMU building), GERMANY

MODERATOR, SPEAKERS AND PANELLISTS BIOGRAPHIES

Workshop Introduction



Matthew Kennedy

Moderator

Co-chair IEA-RET D, Sustainable Energy Authority of Ireland, Ireland

Matthew Kennedy is responsible for energy technology and research development in SEAI where he manages the National Renewable Energy Research, Development and Demonstration Programme. He is a member of Ireland's Official Negotiation Panel for the United Nations Framework Convention on Climate Change (UNFCCC) and a member of the UNFCCC Technology Executive Committee. He is the Programme Chair for the Renewable Energy and Energy Efficiency Partnership (REEEP), and is Vice Chair for the International Energy Agency (IEA) Implementation Agreement on Renewable Energy Technology Deployment (RET D). He is a founding member of the UN Sustainable Energy Finance (SEF) Alliance and previously was Irish National Delegate to the European Commission's RTD Framework 6 and 7 Programmes. Matthew has been responsible for technology strategy across the Irish Government for the past 12 years and holds a Masters degrees from NUI Galway and University College Dublin.



Dolf Gielen

Workshop Host

Director of the Innovation and Technology Centre (IITC), IRENA, Germany

Dolf Gielen is director of the IRENA Technology and Innovation Centre IITC in Bonn. The centre focuses on energy technology planning support, renewable energy technology costing and markets and enabling frameworks for accelerated innovation. Mr Gielen has twenty years of experience in energy planning and worked prior to his current assignment for the International Energy Agency and UNIDO. He has a PhD from Delft University of Technology in the Netherlands.



Hans Jörgen Koch

Workshop Host

IEA-RETD chair, Denmark

Hans Jörgen Koch is the Deputy State Secretary of the Danish Energy Agency, Ministry of Climate, Energy and Building, and has been a leading voice in the energy policy of Denmark as well as in the international energy arena for more than thirty years. Prior to his current position, he served as the Deputy State Secretary at the Ministry of Transport and Energy (2005-2007), and the Ministry of Economic and Business Affairs. From 1994 to 2002 he held the position as Director of Energy Efficiency, Renewables, Technology and R&D at the International Energy Agency (IEA) in Paris. He served as Director General at the Ministry of Energy between 1982 and 1994. Mr. Koch takes a leading role at the IEA as a long-time Governing Board member, chairman of the Renewable Energy Technology Deployment, and chairman of Renewable Energy Working Party of the International Energy Agency (IEA).

Session 1: Levelised costs of energy

Presentation of recent IRENA and IEA-RETD work



Michael Taylor

Speaker 1:1 Cost status and determining factors for renewable power generation

Renewable Costing Analyst, IITC IRENA, Germany

Michael Taylor is an energy analyst at IRENA specialising in energy modelling and the economic analysis of energy sector issues. Michael has almost 20 years' experience in energy modelling, the economic analysis of energy sector issues and energy policy development. Michael has been involved in IRENA's analysis of power generation technologies and costs, as well as IRENA's scenarios and strategies work for Africa. Prior to working with IRENA Michael worked at the IEA in the Economic Analysis Division on the World Energy Outlook (WEO) and in the Energy Technology Policy Division where he was responsible for leading the division's modelling and analysis of the buildings sector including the development of IEA roadmaps for the buildings sector. He was one of the lead authors of the IEAs ground-breaking *Energy Technology Perspectives: Scenarios and Strategies to 2050* series of publications and has contributed to numerous other publications at the IEA (and externally) that focus on the energy sector and the economic and environmental challenges it faces.



Mercedes Mostajo

Speaker 1:2 IEA-RETD Study on cost and business case comparisons of renewable versus non-renewable technologies

Prysm S.A., Spain

Mercedes Mostajo is one of the directors of PRYSMA, a Spanish consulting firm specialized in the Energy, Sustainability and Environment sectors. She leads the strategy and business transformation division of PRYSMA, a group that focuses on devising and implementing innovative and value-enhancing strategies for multinational enterprises and institutions. Prior to PRYSMA she was a partner in Roland Berger Strategy Consultants, and in Booz Allen Hamilton (today Booz&Co). In her 20 years as a consultant she has worked for more than 60 clients in five continents. Mercedes holds a BS/MS in aeronautical engineering by ETISA (Madrid) and an MBA by the Graduate School of Business at Stanford University.



Athanaisia Arapogianni

Panellist

Senior Research Officer, EWEA, Belgium

Arapogianni Athanasia is working as a senior research officer in the European Wind Energy Association. During the last 3 years she has been engaged in research for the cost of wind energy and its evolution compared with other technologies through participating in the IEA wind task 26 and developing a tool on the cost calculation and projection for the EWEA. She is also working on issues related to offshore wind technology and market evolution as well as macroeconomic benefits of wind power in Europe. She holds a mechanical engineering degree and a MSc in wind energy.



Marco Baroni

Panellist

Senior Energy Analyst, International Energy Agency, France

Marco Baroni is Senior Energy Analyst in the Directorate of Global Energy Economics of the International Energy Agency and has co-authored several editions of the World Energy Outlook, the IEA's flagship publication. He is in charge of the power and renewables team and responsible for the related analysis in the World Energy Outlook. He has also been co-responsible for scenario designing, climate analysis, gas, subsidies and energy efficiency. Marco re-joined the IEA after three years spent in the private sector as Senior Market Analyst in Essent Trading – a power and gas Dutch utility – responsible for coal and power markets mid- and long-term analysis. He holds a Master Degree in Electrical Engineering from the University of Padova, Italy.



Christoph Kost

Panellist

Scientist, Fraunhofer Institute for Solar Energy Systems ISE, Germany

Christoph Kost is a scientist in the group “Renewable Energy Innovation Policy” at the Fraunhofer Institute for Solar Energy Systems (ISE), Freiburg, Germany. He studied “Business Engineering” (Diplom-Wirtschaftsingenieurwesen) at the University of Karlsruhe (Germany) and Groningen (Netherlands) between 2003 and 2009. His current scientific work includes the topics of policy analysis and financing in the field of renewable energy sources, the derivation of technology costs and market introduction strategies for renewable energy technologies. He has worked in several international energy projects related to the MENA region for the World Bank, GIZ, AFD, kfw and Masen in the last years. In 2010 and 2012 he published the Fraunhofer study “Levelized costs of renewable energy technologies.”



Marietta Sander

Panellist

Executive Director, International Geothermal Association (IGA), Germany

Marietta Sander is the Executive Director of the International Geothermal Association (IGA). In her function for the IGA Marietta Sander manages the IGA headquarters, provides technical expertise on geothermal energy and networking opportunities to practitioners, international organisations, civil society and others. Prior to her work for the IGA Marietta Sander managed an international technical assistance project with a focus on promoting the use of geothermal energy in countries along the East African rift system. She is a certified Project Manager Renewable Energies and has extensive work experience in East and southern Africa, Latin America and South-East Asia. Through her previous work in international development cooperation she has extensive experience in advising decision-makers, government representatives, scientists, industry representatives as well as civil society.

Session 2: System Integration Costs



Carsten Hoyer-Klick

Speaker Session 2:1 External costs of system integration for variable RE, comparing options on equal power quality

Head of Department, German Aerospace Center, Germany

Carsten Hoyer-Klick earned his diploma in physics at the University of Oldenburg (Germany) with a thesis on modelling concentrating solar power plants in 1998. He then continued to work in the energy meteorology group of the University and worked on the assessment of solar resources from satellite data. In 2003 he changed to DLR to develop the SOLEMI (Solar Energy Mining) database. Within this work he is active in UNEP's SWERA (Solar and Wind Energy Resource Assessment Programme) and the IEA Task on "Solar Resource Knowledge Management". He is the technical coordinator of the Clean Energy Ministerial / IRENA "Global Atlas for solar and Wind Energy". Since Oct. 2009 he is one of the intermediate heads of the department. The main topic of the department is the development of national and international scenarios for the deployment of high shares of renewable energies.



Renée Heller

Speaker 2:2 The need for storage and backup capacity

Unit manager, Ecofys, Netherlands

Renée Heller (PhD) is an energy expert specialized in the development of new (renewable) energy systems. She leads the unit Integrated Energy Systems at Ecofys. She conducted PhD research on hydrogen storage in thin films for applications in fuel cell driven cars (Utrecht University, 2000). In 2000 she started working at Ecofys as a consultant in the field of energy system development and energy planning. From 2003-2009 Renée was energy advisor and research manager for Innogrow, the subsidiary company of Econcern that manufactured and supplied the closed greenhouse. Renée specialized in the integration of heat pumps, underground heat storage, (bio)CHP and solar energy in areas such as housing estates, mixed industrial areas and horticultural areas. From 2010-2011 she was unit manager Built Environment Netherlands.



Anders Bavnhøj Hansen

Speaker Session 2:3 The TSO/DSO perspective

Chief Consultant Msc, Energinet Denmark

Anders Bavnhøj Hansen is working as chief consultant in strategic planning at the Danish electricity and gas TSO, Energinet.dk. Previous to this he worked as a head section in the Energy System Planning section at the Danish Energy Agency and with the Power System R&D division of ABB Corporate Research. Mr Bavnhøj Hansen graduated in Energy technology (MSc) from Aalborg University, Denmark. Special fields of expertise are Strategic planning of energy systems with a high degree of renewables.



Matthias Herrmann

Panelist

Head of Market Intelligence, E.ON Climate & Renewables GmbH, Germany

Matthias Herrmann is Head of Market Intelligence at E.ON Climate & Renewables (EC&R), covering a range of topics from regulatory attractiveness to levelized cost of energy and RES technological development. Although initially specializing in nuclear reactor technology at Imperial College London he has worked in various positions in the renewable energy industry before joining EC&R in 2008, which has since grown into a leading global renewable energy player with 8bn€ invested and 4.2GW of assets in operation across 11 countries.



Jami Hossain

Panelist

Treasurer, WWEA & Chief mentor and co-founder of WinDForce Management Services Private Limited, India

A mechanical engineer, **Jami Hossain** over the last twenty seven years has consistently worked in the Energy-Environment Sector. Since 1985, when he got involved in setting up the first wind farms in Asia, he has continued to work on wind energy development and is known as a wind energy lobbyist and an acknowledged expert. His major contribution has been the assessment of potential for wind farms in India. Jami's past and current affiliations include TERI, Enercon, Industry Associations in India, and Winrock International. He was elected as Treasurer of World Wind Energy

association in 2011. Jami founded Windforce Management Services Private Limited with investing partners in 2008. The company has carried out 3000 MW of wind resource assessment and 300 MW of wind farm project implementation as Owner's Engineers and 1000 MW of Technical Due Diligence of wind farm assets.



Simon Müller

Panelist

Energy Analyst, IEA, France

Simon Müller leads the IEA's work on the Grid and System Integration of Renewables. He is currently focusing on the technical and economic determinants of power system flexibility. Prior to working on system integration, he authored the IEA publication *Deploying Renewables – Best and Future Policy Practice*, which provides a comparative assessment of the impact and cost-effectiveness of RE support policies. Before joining the IEA, Mr. Müller worked for a technical cooperation project in the Mediterranean and the German Government. He holds a M.Sc. in Physics from the University of Bremen.

Session 3: Electric vehicle prospects for accelerated deployment of renewables



Michael Taylor

Introduction

Please see Session 1 for Michael Taylor's full biographical details.



Thomas Dederichs

Speaker 3:1 IEA-RETD Project RETRANS The co-evaluation of the electricity and transport sector

Bundesnetzagentur, Germany

Thomas Dederichs is currently working on the national grid development plan with the German Regulator (Bundesnetzagentur). He studied Electrical Engineering as well Economics and Business Administration at RWTH Aachen University. His technical research focuses on

the efficient design of sustainable energy supply structures using distributed PV, CHP and electric vehicles. With regards to his economical studies he is very involved in technology diffusion and innovation management. He was awarded an IDEA League research grant in 2009 to study the impacts of externalities on Smart Grids at Imperial College, London.



Carsten Hoyer-Klick

Speaker 3:2 Perspectives of EV in a power system with high shares of decentralised and renewable power

Please see Session 2 for Carsten Hoyer-Klick's full biographical details.



Francisco Carranza

Speaker 3:3 Status of EV and battery development.

Manager, Nissan Europe, France

Francisco Carranza is manager of the Nissan Europe External Affairs; he is responsible for the European strategic collaboration initiatives, the environmental and zero emissions support and the corporate reputation activities. He has been initiating partnerships between Renault-Nissan and some of the major stakeholders in the zero emissions mobility since 2008. Francisco is also actively contributing to the IEA implementing agreements related to the electric vehicles, to the fuel cell vehicles and to hydrogen production. Francisco has more than 10 years of experience in the automotive sector, including management responsibilities in the R&D, business development and external affairs. He has an engineering degree from Seville Engineering School and a MSc from the French Institute of Petroleum, he also have a MBA from EM Lyon and an MBA from Cranfield Management School.



Konrad Pütz

Panellist

Transnova, Norway

Konrad Pütz is responsible for environmental analysis at the Norwegian public funding agency Transnova, a Norwegian governmental tool for climate efficient transport. Transnova supports projects contributing to sustainable mobility – amongst them projects facilitating the substitution of fossil fuels with hydrogen, electricity and selected biofuels. Konrad has a degree in

Engineering from the Norwegian Naval Academy and a Master of Science in Environmental Economics from the Norwegian Agricultural University. After some years as a chief engineer and technical inspector he started working as researcher at the Norwegian Institute of Transport Economics. Konrad Pütz worked at the Bellona Foundation from 2006, mainly with environmental consequences of transport before he joined Transnova in 2010.



Andreas Zucker

Panellist

Scientific Technical Officer, European Commission, Joint Research Centre, Institute for Energy and Transport, Petten, The Netherlands

Andreas Zucker is working as an official of the European Commission at the JRC in Petten, Netherlands. His work includes Research and Policy advice on a number of topics related to energy storage, RES market integration, energy systems modelling and technology development. He has worked for two German utilities for more than 8 years on topics ranging from power generation investment projects, nuclear strategy, market analysis, corporate R&D and corporate strategy before joining the European Commission in May 2012.

Session 4: Consequences for policy makers and other stakeholders



Dolf Gielen

Panellist

Please see Workshop Introduction for Dolf Gielen's full biographical details.



Hans Jörgen Koch

Panellist

Please see Workshop Introduction for Hans Jörgen Koch's full biographical details.



Martin Schöpe

Panellist

Head of Division, International Affairs of Renewable Energy, German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Berlin

Martin Schöpe has been working at the Federal Ministry for the Environment on linkages between energy and the environment on both the international and European level since 2003. Specializing in international cooperation in the field of renewable energy, he was actively engaged in preparing for the international conference *renewables 2004* and its various follow-up trajectories. In this context, he also led the Ministry effort and German initiative to establish the International Renewable Energy Agency (IRENA), founded in January 2009 in Bonn. At the European level, he has been following the EU climate and energy policy leading to the new Renewables Directive at EU level. He is also Vice-President of the Renewable Energy Working Party of the IEA and Member of the Board of Directors of an International Fund investing in renewable energy and energy efficiency in developing countries (GEEREF). Martin Schöpe studied law at the University of Bonn. He holds a PhD in European law.



Maria Sicilia

Panellist

Deputy Director-General, Spanish Ministry of Industry, Energy and Tourism Spain

Maria Sicilia is Deputy Director-General for Energy Planning at the Spanish Ministry of Industry, Energy and Tourism. As such she is responsible for long-term energy policy and prospective, including network expansion, renewables, energy efficiency and R&D. She is also a member of the Board of IDAE. Prior to this current assignment she was Head of Prospective at Iberdrola Renovables, and a member of the steering committees of the main renewable industry associations (EWEA, GWEC, AEE, etc.) and of REN-21. Before that she worked in the International Energy Agency as Senior Electricity Markets Expert, and in the UK Office of Gas and Electricity Markets (Ofgem) as a Regulatory Economist in the Markets Directorate. Ms. Sicilia is a senior official for the Spanish Government and holds an MPA in Economic Policy from the London School of Economics and Political Science (LSE), where she specialised in Industrial Organisation.