39th IAEE International Conference

Energy: Expectations and Uncertainty

19 - 22 JUNE 2016 Bergen, Norway
8. Renewable Electricity Generation
(Aud. A4/3, 10:00 a.m.)
Thomas Leutier, Presiding
TSE Researcher, Toulouse School of Economics

Comparative Scenarios in Islanded Systems: Energy Supply/Storage Sizing Problem Applied to Electricity and Mobility
Solja Joulia
Lyon University

8. Solar, Wind and Market Power in a Hydro Based Grid
Stephen Bolelli
Mina Giolami
University of Auckland

Impact of Variable Renewable Energy Production on Electricity Prices through a Modeling Approach
Cyril Martin de Lagarde
Jana Grei
Université Paris-Dauphine
Christophe Bornery
EDF

Miguel A. Castro
Michigan State University

Financial Risk and Electricity Markets
(Aud. A4/3, 10:00 a.m.)
Patrick Narkel, Presiding
Partner, ADAPT Consulting AS

Financial Arbitrage and Efficient Dispatch in Wholesale Electricity Markets
John E. Parsons
MIT Sloan School of Management
California ISO

Elna Mattrang
Jeremy Larre
Tjäder Martin
FERC

Zero-Variable Cost Power Systems: Implications for Electricity Market Design and Capacity Investments
Jesse D. Jenkins
Nevor Sehulveda
Massachusetts Institute of Technology
Fernando de Sátie

Risk Exposure in Electricity Markets: The Need for Interday Hedging
Rahul Jumadusay Douroumand
Assistant Professor of Economics, RSB Paris School of Business

Market and Policy Risks for VRE Investment and their Impacts on Effectiveness and Efficiency of RES-E Policy Targets - An Agent-Based Modelling Approach
Matthias Reig
German Aerospace Center (DLR) - Systems Analysis and Technology Assessment

The Corporate Social Responsibility of Hydropower Companies in Alpine Regions - A Welfare-economic Approach
Werner Hedges
HTW Chur

8. Innovations and Technologies
(Aud. Teine Hansen)

Roger Fouquet, Presiding
Professor, Grantham Research Inst LSE

Life Cycle Analyses of End-User Electricity Generation in Ten Major European Countries
Gorkem F. Uctug
Green Alevli
Boğaziçi University

The Welfare Effects of Energy Services and Technologies (1700-2010)
Roger Fouquet
London School of Economics and Political Science (LSE)

Technology Implications for an Integrated European Bioeconomy
Fabian Schloer
Rainhard Hass
Lukas Kranzl
Energy Economics Group

Structuring Public Support for Radical Low-Carbon Innovation in the Materials Sector: Bridging the Valley of Death
Vera Z. Opfer
Karsten Neuhoff
DIW Berlin
Gregory Nunn
University of Wisconsin Madison

Multinational Innovation, Product Life Cycles and Intellectual Property Rights Protection: Which is the Best Place to Invent Something?
Giulia Velacchi
IHEID

9. IAEE Best Student Paper Award Session
(Aud. A4/3, 10:00 a.m.)

Knut Einar Rosendahl, Presiding
Professor, Norwegian Univ. of Life Science

Carbon Taxes, Oil Monopoly and Petrodollar Recycling
Waldemar Marz
Johannes Pfeiffer
IFO Institute for Economic Research at the University of Munich

Estimating the Potential for Electricity Savings in Households
Nina Boogar
ETH Zurich, Center of Economic Research (CER-ETH)

Reliability, Congestion and Investment in Electricity Transmission
Martén Ovare
KU Leuven, Department of Economics

How to Sell Renewable Electricity - Interactions of the Intraday and Day-Ahead Market Under Uncertainty
Frank Obermüller
Andreas Knaut
Institute of Energy Economy, University of Cologne

10. Heat and Electricity (Aud. 23)
Benjamin Schlesinger, Presiding
President, Benjamin Schlesinger & Assoc LLC

CHP Plant Operation and Electricity Market Prices - Analytical Insights and Large-Scale Model Application
Björn Reifenber
Research Associate, University of Duisburg-Essen

Oxana Rosnes
Berta Byrs
Tariq Faehn
Statistics Norway

Endogenous Power and Heat Generation Modelling in various CHP Plant Types
Andreas Bloess
DIW Berlin

Status-quo Bias and Consumers' Willingness to Pay for Green Electricity: A Discrete Choice Experiment With Real Economic Incentives
Fabian Grabi
Roland Henges
Clausthal University of Technology

Technical-Economic Potential of PV Systems on Colombian Residential Sector
Rosa Esperanza Gonzalez-Mahecha
André Lucena
Alexandra Sales
Raul Miranda
PPC/COPPE
Ferreira Paula
Universidade do Minho

11. Prospects for Nuclear Power (Aud. 22)
Christian von Hirschhausen, Presiding
Professor, TU Berlin

Phasing Out Nuclear Power in Europe
Rolf Golumbek
Hilde H. Leissner
Frisch Centre
Finn R. Aune
Statistics Norway

Ambiguity, Aversion and the Expected Cost of Rare Energy Disasters: An Application to Nuclear Power Accidents
Roman Basler
François Lequeux
Mines ParisTech - CERNA Centre for Industrial Economics

Logistics of Dismantling Nuclear Power Plants - A Model-Based Analysis of Low- and Intermediate-Level Waste Management in Germany
Tom Schwenk
German Institute for Economic Research (DIW Berlin)
Raman Menon
Technische Universität Berlin (TU Berlin)
Overview
The existing EU climate and energy package sets binding targets for all Member States (MS) for the share of renewable energy in gross final energy demand in 2020. The details for applicable promotion schemes for renewable energies and market access for investments in appropriate technologies are regulated by Directive 2009/28/EC. The Directive was also adapted on the 18 October 2012 by the Energy Community (EnC) and as such sets binding targets in 2020 and a similar framework for its eight Contracting Parties (CPs) (2012/04/MC-EnC).

Examined research questions:
- How does the historic deployment of renewable energy sources (RES) in the electricity-, heat- and transport sector fit to the self-constituted interim-targets formulated in the National Renewable Action Plans (NREAP) of the 28 EU MS and eight EnC CPs?
- What results do the model-based assessments of the energy policy framework provide for the sector of renewable energies of the respective countries with regard to the 2020 target achievement?
- How do the dynamics of RES deployment in EnC CPs compare to the EU MS, and what does this reveal about the state of the energy policy framework for the sector of renewable energies in the EnC CPs?

Methods
In a first step, the actual deployment of RES technologies is compared to the MS and CPs NREAPs to assess their current progress.
In a second step, scenarios for the assessment of the energy policy framework for RES in all MS and CPs are developed with the application of the Green-X model. The Green-X model incorporates an extensive database on the costs and potentials for the expansion of renewable energies in Europe and the Mediterranean countries. These scenarios show the chances of a possible target achievement for all individual countries and for the EU wide 20% target share of renewable energies in 2020. There exists no overall target for the EnC for 2020. The Directive 2009/28/EC and 2012/04/MC-EnC respectively include a reporting obligation for the first time on the 31st of December, 2011 for the EU MS and on the 31st of December, 2013 for the CPs and thereafter every two years. The so-called progress reports have to be compiled in a uniform format including a list of policy measures concerning the conditions for investments in renewable energy. This information about currently implemented and planned policies to stimulate investment renewable energies is collected for all MS and CPs. A distinction is made between the following measures:
  - Political initiatives to improve the financial support framework for renewable energy.
  - Measures to reduce non-economic barriers that reduce investment readiness in renewable energy.
This information obliges for an in-depth assessment of the current framework conditions for investments in RES technologies.
In a last step, the past progress and target achievement perspectives are compared between selected MS and CPs. This comparison should show the improvements or deficiencies concerning policy framework conditions on the subject of the deployment of RES technologies in selected countries.
The data gathering and scenario development work for this analysis for the EU were conducted within two projects with the title „Renewable energy progress and biofuels sustainability“ published in 2012 and 2014 (Hamelink et al., 2012 and 2014). Additionally the results of comparable work for the “Keep-on-track” project are included, to comprise the most actual data available for the EU perspective (Resch et al., 2015). The past RES deployment progress and modelling-based assessment for a target achievement in the EnC CPs was published in Veum et al., 2015.
Results and Conclusions

Based on the data of 2013 of 28 MS, 21 were on track regarding the RES trajectories defined in the NREAP and 7 underachieved. Regarding the interim targets defined in the RES Directive, 25 Member States have already met the 2013/2014 milestone (Resch et al., 2015). This is not surprising, given the relatively low ambition level of the interim targets in the early years. Trajectories will become steeper just before 2020. The picture looks worse regarding the CPs of the EnC. A reason may be that the minimum trajectory for the overall RES share in the gross final energy consumption in 2011/2012 defined by the RES Directive (2012/04/MC-EnC) sets a relatively strict interim target. Only one CP of the EnC, namely Montenegro, achieved its RED target for 2011/2012. To the contrary all CPs except Moldova achieved their interim targets set in the NREAP (Veum et al., 2015).

A comparison of the model results reflecting the current policy initiatives for the EU shows an underachievement by 1.6 percentage points of the renewable energy target of a 20% RES share in 2020 (Resch et al., 2015). Out of the 28 Member States analysed in 2015, only ten are expected to meet their 2020 targets (Austria, Bulgaria, Croatia, Cyprus, Estonia, Ireland, Italy, Lithuania, Romania, and Sweden). A target achievement in 2020 is even more challenging for the CPs of the EnC. Montenegro is expected to reach the given 2020 target with currently implemented and planned policy measures. Another CP, Moldova may be added to that list where expected 2020 RES deployment is slightly below the given target. All other CPs appear to fail in complying with their binding 2020 RES target whereby a comparatively small gap is expected for Serbia (Veum et al., 2015).

If the market situation for RES technologies is compared between the EU and the EnC, it can be seen that the framework conditions in the EnC are less desirable than in the EU. A more detailed picture incuding a specific view on the historic and expected deployment rates and absolute deployment of RES technologies in the electricity, heating and cooling and transport sectors will be incuded in the final version of this analysis.

References


