Workshop

Economic Challenges for Energy

Madrid, 22-24 January 2014

Wednesday, 22 January (open session)

19.30 -20.45	**Energy from a Societal Perspective**
	Muhammad Saggaf, KAPSARC

Thursday, 23 January

09.30 -10.00	Welcome coffee and introduction
10.00 -12.00	**Energy demand and energy efficiency**
	José M. Labeaga, UNED
	Michael Hanemann, Arizona State and Berkeley
12.00 - 12.30	Coffee break
12.30 - 14.30	**Energy security**
	Mariano Marzo, Barcelona
	David Robinson, Oxford Institute for Energy Studies
14.30 - 15.30	Lunch
15.30 - 17.30	**Energy and climate policies**
	Zhang Xiliang, Tsinghua
	Ottmar Edenhofer, PIK
17.30 - 18.00	Coffee break
18.00 - 19.00	**Presentation of the Economics for Energy Annual Report: Energy and Environmental Taxes in Spain (open session)**
21.00	Workshop Dinner

Friday, 24 January

10.00 - 12.00	**Innovation in energy**
	Antoine Dechezlepretre, LSE
	Diego Díaz, Iberdrola
12.00 - 12.30	Coffee break
12.30 - 14.30	**Long-term energy prospective**
	Antonio Soria, IPTS
	Arnulf Grubler, IIASA

Energy demand and energy efficiency | José M. Labeaga

Energy efficiency constitutes a key factor for development of the economies and it is particularly relevant in developed and energy dependent countries like Spain due to its vulnerability to external supply or prices shocks. The main aim of this presentation is to examine the best policies to encourage energy saving and energy efficiency based on empirical results obtained in demand equations for the sectors of domestic energy and transport. In late year, these sectors are those with higher consumption growth while their levels of consumption and emissions are difficult to control. In general, energy efficiency plans did not get their targets, when they were explicit, in most of the countries around the world. As a consequence, further analyses are needed to understand the key factors which can contribute to better opportunities of energy saving and energy efficiency. This analysis aims at describing the main determinants of energy consumption at the domestic domain and at the transport sector in order to better identify the most adequate paths towards these objectives. Moreover, we claim for better data and for an explicit specification of the targets which include evaluation and incentives for fulfillment (disincentives on the contrary). We consider as a special case the Spanish Plan de Ahorro y Eficiencia Energética 2011-2020 whose objectives lie within the 20-20-20 European strategy.

Energy demand and energy efficiency | Michael Hanemann

The presentation reviews alternative approaches to the formulation of an economic model of a consumer's demand for energy. This is of relevance for both energy analysts and energy policymakers. The formulation of demand has practical implications for the econometric modeling of demand, including the types of data required and the statistical estimation that can be performed. It also has implications for assessing the welfare effects – the economic benefits and costs -- of changes in price, in product attributes, and in energy system delivery, which form the basis for policy evaluation of energy efficiency, efficiency standards, and emission trading systems.

Energy security | Mariano Marzo

Many of the long-held tenets of the energy sector are being rewritten. Major importers are becoming exporters, while countries long-defined as major energy exporters are also becoming leading centres of global demand growth. The rise of unconventional oil and gas is transforming our understanding of the distribution of the world's energy resources. Awareness of the dynamics underpinning energy markets is essential for decisionmakers attempting to reconcile economic, energy and environmental objectives. Those that anticipate global energy developments successfully can derive an advantage, while those that fail to do so risk making poor policy and investment decisions.

Energy security | David Robinson

The US and China have swapped places in world energy markets. In the 1970's, the US was the largest energy consumer and importer of crude oil, while China was largely energy self-reliant. The US was alarmed when the Arab oil embargo demonstrated the extent of its vulnerability to world oil markets; this led, among other things, to the creation of the IEA. Today, China is the world's largest consumer of energy and the largest importer of crude oil, while the US is increasingly self-reliant with respect to fossil fuels. In this intervention, David Robinson will explore the evidence of China's increasing reliance on imported fossil fuels, and consider China's response to its concerns over security of supply. He will also explore some of the implications for world energy markets and China's relations with key counties and regions.

Technologies and policies for the transition to a low carbon economy in China | Zhang Xiliang

The presentation introduces the key energy and environmental issues in China's modernization process. It explores the technological and policy options for the transition to a low carbon economy in China. China has recently taken substantial efforts in decarbonizing its economy. The policy actions cover binding energy conservation and environmental pollution control targets, economic incentives for sustainable energy, and public R&D supports. In order to accelerate the transit process, however, China needs to take further actions such as strengthening energy conservation, restructuring the economy, and decarbonizing the energy supply mix.

Closing the emission price gap | Ottmar Edenhofer

The Fifth Assessment Report of the Intergovernmental Panel on Climate Change has reaffirmed the potentially disastrous consequences of unabated climate change. Yet, an international agreement seems unlikely to emerge by 2015, as free-rider incentives undermine incentives to participate in the provision of the global public good of emission reduction. Nevertheless, despite the lack of an internationally binding climate agreement, several countries (including 18 of the world's 20 largest emitters) have implemented policies to reduce their emissions. We identify four reasons why putting a price on carbon could be desirable for domestic policy makers: a) using the least distortionary taxes to finance government spending, b) increasing macro-economic efficiency and intergenerational justice, c) reaping co-benefits occurring on the national level , and d) increasing flexibility and political feasibility when policy instruments are pledged instead of emission targets and timetables. These four motivations might reinforce each other and gradually lead to more international cooperation.

Climate change policies, innovation and growth | Antoine Dechezlepretre

The presentation will revolve around the links between environmental policies, innovation and economic growth. We will start by explaining that policies are needed to encourage the development of clean energy technologies, because of the existence of environmental externalities associated with polluting technologies and because of the higher knowledge spillovers generated by new technologies. We will show that climate change and energy policies are able to induce innovation in clean technologies, and that the path-dependence in the direction of technological change means that public support to innovation needs only be temporary. We will then ask what are the benefits of policies to encourage the development of clean energies. In particular we will analyse the impact of these policies on the competitiveness of domestic inventors and the potential consequences of these policies for economic growth.

Disruptive innovation in sustainable energy | Diego Díaz

PERSEO is IBERDROLA's corporate venture capital program (70M€) to invest in the technologies that will help shaping the future of energy. Since its creation in 2008, more than 40 M€ have already been invested through this program in start-up companies around the globe that develop technologies and new businesses in the energy sector.
The main goals of this initiative are:

- To ensure IBERDROLA's access to the energy technologies of the future.
- To monitor and pursue new business opportunities to IBERDROLA.
- To foster entrepreneurship and the development of an innovative business in the energy sector.

Estimating the physical and economic impact of climate change in Europe: a methodological discussion and some sector-wise results | Antonio Soria

The presentation will focus on the discussion of the existing alternatives to address the impacts of climate change (a variety of scenarios) form the economic standpoint. The preferred approach (bottom-up methodology) has been chosen due to the capability of analyse specific adaptation policies adopted vis-à-vis specific damaging patterns, and therefore the ease to address the cost-effectiveness of adaptation policies.

Lessons from historical energy transitions and implications for energy technology innovation systems | Arnulf Grübler

The presentation reviews major characteristics and drivers of historical energy transitions and relates those to the recent findings from the Global Energy Assessment on energy technology innovation systems. The major conclusions are: Current innovation efforts and portfolios are both insufficient and too supply-side biased, and current policy frameworks are insufficiently aligned and globalized to enable a massive and swift sustainability transition

Muhammad Saggaf

Dr. Saggaf is President of the King Abdullah Petroleum Studies and Research Center (KAPSARC), an independent, non-profit research institution dedicated to researching energy economics, policy, technology, and the environment. Prior to that, Dr. Saggaf was the head of Saudi Aramco's Strategic Transformation Office, responsible for pushing forward a transformation that would allow SA to achieve ambitious aspirations in the following decades. In Saudi Aramco he was also Chief Petroleum Engineer, responsible for the development and management of its oil and gas fields with the implementation of some of the most cutting-edge technologies in petroleum engineering during his tenure. He has received several international awards, including the J. Clarence Karcher Award from the Society of Exploration Geophysicists (SEG), the Lester C. Uren Technical Excellence Award and the Distinguished Member Award from the Society of Petroleum Engineers (SPE), and the Eisenhower Fellowship. He has authored numerous refereed technical papers, books, a U.S. patent, and founded and edited a technical journal in this area. Dr. Saggaf holds a B.Sc. degree in Mathematics from King Fahad University of Petroleum and Minerals (KFUPM), M.Sc. and Ph.D. degrees in geophysics from the Massachusetts Institute of Technology (MIT), and a MBA from KFUPM.

José M. Labeaga

Dr. Labeaga is professor of Economic Analysis at the Spanish Open University (UNED). He holds a degree in Economics from the University of Zaragoza and a Ph.D from the Autonomous University of Barcelona (UAB). He was general director of the Spanish Institute for Fiscal Studies between 2008 and 2012. Prior to that he was director of the FEDEA-BBVA research chair on new consumers. He has been mainly interested in the analysis of individual behavior in consumption and labor decisions, and in the simulation and assessment of the effects of different public policies. He has published several papers and book chapters on energy demand estimation and on the impact of energy and environmental policy changes.

Michael Hanemann

Dr. Hanemann is Julie A. Wrigley Professor in Sustainability and Distinguished Sustainability Scientist at the School of Sustainability and Department of Economics of Arizona State University (ASU). Prior to coming to ASU, he was Professor of environmental and resource economics in the Department of Agricultural and Resources Economics at the University of California at Berkeley for more tan 40 years, where he still collaborates. Michael earned a B.A. from Oxford University in Philosophy, Politics and Economics, a M.Sc. in Economics from the London School of Economics and Ph.D. in Economics from Harvard University.

Mariano Marzo

Dr. Marzo is full professor of Stratigraphy at the Faculty of Geology of the University of Barcelona where he teaches Petroleum Geology and Energy Resources. Dr. Marzo's research interests focus on the application of clastic sedimentology, sequence stratigraphy, reservoir modelling, and basin analysis to the exploration and production of hydrocarbons. He is actively involved in training activities and research projects funded by oil and gas companies (Cepsa, ConocoPhillips, Enagas, ExxonMobil, Gas Natural Fenosa, Norsk Hydro, Repsol-YPF, Shell, Statoil and Total among others). He has worked in southern Europe, North Sea, South America, northern Africa and Middle East. M. Marzo has authored and co-authored more than 75 scientific papers, edited or co-edited 15 books and special issues on sedimentology and stratigraphy, held more than 100 presentations on conferences and workshops and has served in the editorial board of highly-reputed international geological journals like "Basin Research", "Geology" and "Sedimentology". M. Marzo is member of the American Association of Petroleum Geologists and of the European Association of Petroleum Geoscientists & Engineers. He is actively involved in several advisory panels on energy issues and he is a regular collaborator on energy issues to the main Spain's media.

David Robinson

Dr. Robinson is a consulting economist specializing in public policy and corporate strategy in the energy sector. He advises governments, corporations and international organizations on industry structure, regulation, market design, competition and decarbonization. He also advises clients and their legal advisors involved in litigation related to competition, economic damages and contractual disputes. His recent research focuses on US energy and climate policy, Sino-EU collaboration in energy, EU liberalization and decarbonization policies, the new role for customers in modern electricity systems, and natural gas market design. David joined the Oxford Institute for Energy Studies in July 2007. He lives in Madrid with his wife Maria Gloria Andrade; they have two children, Nicolás and Amalia.

Zhang Xiliang

Dr. Zhang holds a Ph.D. of Engineering from Tsinghua University. Dr. Zhang is currently a professor of Management Science and Engineering and director of Institute of Energy, Environment and Economy, Tsinghua University. Prof. Zhang has conducted research on sustainable energy technology innovation and diffusion, markets, policies, and futures for China. Prof. Zhang is currently the principle investigator for the 4-year research project "China's mid-and long-term low carbon development strategy" which is sponsored by Ministry of Science and Technology with the support of National Development and Reform Commission. Prof. Zhang has been a lead author of the 4th and 5th IPCC Climate Change Assessment Report. Dr. Zhang has been the secretary general of the New Energy Committee of China Energy Research Society since 2006, and vice chair of China Renewable Energy Industry Association since 2011.

Ottmar Edenhofer

Dr. Edenhofer is Professor of the Economics of Climate Change at the TU Berlin - Berlin Institute of Technology and Co-Chair of Working Group III of the Intergovernmental Panel on Climate Change (IPCC), which won the Nobel Peace Prize in 2007. He is Deputy Director and Chief Economist at the Potsdam Institute for Climate Impact Research and currently leads Research Domain III - Sustainable Solutions - which is focusing on research in the field of the Economics of Atmospheric Stabilisation. In 2012 he was appointed director of the newly founded Mercator Research Institute on Global Commons and Climate Change (MCC) and supports the Science-Industry Cooperation, the Workgroup Climate, Energy and Environment within the German National Academy of Sciences Leopoldina as an active member, and furthermore advises the World Bank within the advisory committee of the Green Growth Knowledge Platform. Since 2013 he is also co-chairing the new Energy Platform by the European Council of Academies of Applied Sciences, Technologies and Engineering (Euro-CASE), a non-profit organization of national academies from 21 European countries. Professor Ottmar Edenhofer holds a degree in economics with distinction from Ludwig-Maximilians-Universität Munich and a BA in Philosophy from the Munich School of Philosophy (Hochschule für Philosophie München). He wrote his Ph.D. thesis in Economics ("summa cum laude") in 1999.

Antoine Dechezlepretre

Dr. Dechezlepretre is a Research Fellow at the Grantham Research Institute on Climate Change and the Environment, London School of Economics, where he leads the Institute's work on the empirical evaluation of climate change policies. His research deals principally with the impact of environmental and climate change policies on the development and the international diffusion of clean technologies. His research has been published in international scientific journals, mainly in the field of applied microeconomics, environmental economics and energy economics. He has presented his works at many international conferences, including the last United Nations COP conference in Warsaw. Dr. Dechezlepretre has worked as an external consultant for ICTSD, the OECD Environment Directorate, the UK Climate Change Committee, France's International Development Agency (AFD) and the French Environment Protection Agency (ADEME). Dr. Dechezlepretre holds a PhD in economics from Ecole des Mines de Paris (France).

Díego Díaz

Mr. Díaz is responsible for the management of Iberdrola´s venture capital program – Iberdrola Ventures - PERSEO, aimed at investing in clean energy start-ups. He joined Iberdrola in 2008 and since then he has contributed to the launch and management of the company´s venture program, engaging its activity with the corporate innovation strategy. Leading a team of investment professionals, he is responsible for the management of the program and the full life cycle of the investments, serving as a director in the board of several portfolio companies. After graduating, he developed his career in several roles related to engineering, technology development, innovation and entrepreneurship both in the Telco (Telefonica R&D and Eircom) and Energy sectors. He holds an M.Sc in Engineering from the Universidad Politécnica de Madrid and an executive degree in Venture Capital from the Walter A. Haas School of Business in the University of California at Berkeley.

Antonio Soria

Dr. Soria holds degrees in Energy Engineering (1986) and Economic Science (1997). He earned his Ph.D in Nuclear Engineering at the Universidad Politécnica de Madrid (1990). Before joining the European Commission's IPTS, he worked at the Spanish Ministry of Industry's research centre CIEMAT, and then at the EC JRC Ispra site. Since 1994 he works as scientific officer at Institute of Prospective Technological Studies (CCR-Seville), European Commission, as coordinator of the group "Energy and Climate Change" within the Unit "Sustainability in Industry, Energy and Transport" (SIET). The related issues cover from technology assessment aspects to quantitative evaluation of socio-economic problems associated to energy conversion and use. His current work focuses on the dynamics of energy technology diffusion, as well as on the assessment of the analysis of global warming issues such as carbon emissions reduction policies and optimal mitigation paths, including economic instruments such emission trading, etc., and the monitoring of long-term energy indicators.

Arnulf Grübler

Dr. Grübler first joined IIASA in 1976 to work with the Energy Systems Program and currently works as a Senior Research Scholar and Acting Program Leader of the Transitions to New Technologies Program. He also holds a part-time appointment as Professor in the Field of Energy and Technology at the School of Forestry and Environmental Studies at Yale University, New Haven, USA. His teaching and research focuses on the long-term history and future of technology and the environment with emphasis on energy, transport, and communication systems. Dr. Grübler received his master's degree in engineering from the Technical University of Vienna, where he was also awarded his PhD. He has been serving as Lead and Contributing Author and as Review Editor for the Second, Third, Fourth, and Fifth Assessment Reports of the IPCC. He was also Convening Lead and Coordinating Author for three knowledge modules of the Global Energy Assessment completed in 2012. He has published widely as author, coauthor, or editor in the domains of (modeling of) technological change and diffusion, long wave theory, historical transitions in energy and transport systems, long-term future scenarios, energy technology innovation systems and policy, climate change, and resource economics.

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