President’s Message

I am pleased to welcome you to this edition of the IAEE Energy Forum. I would like to begin my message with a brief preamble on global energy and energy resources and the emerging global energy supply and consumption patterns worldwide. Empirical evidence tends to suggest that energy resources abound worldwide (www.bp.com). More liquid hydrocarbons and natural gas reserves have been added than extracted, in an aggregate sense, since 1980. The supply mix of energy from energy resources has improved significantly in major energy consuming nations. Of course, translating these resources to energy supply continues to require, in addition to political will, economic incentives and technology innovation. Could the astounding impact of these competing yet complementing factors on petroleum resource development outcomes, within the last 10 years, finally render the peak oil hypothesis that the world is running out oil groundless?

Interestingly, these determinants of the emerging energy production and consumption landscapes are fundamental to the sustainability of the new energy reconfiguration. First, energy prices give the signals to both producers and consumers act as rational economic beings. Secondly, high energy prices encourage consumers to conserve and use energy efficiently thereby prolonging energy resource life. This phenomenon is evident in the declining trend of energy intensity in nearly all developed economies. On the other hand, high oil prices make energy resources in all forms become more attractive in an economic sense with the support of technology innovation than they would have been under low energy price scenarios. Perhaps technology innovation and sustainable high energy prices coupled with aggressive competition for investment opportunities may actually help the U.S. become a net exporter of natural gas in the near future and less dependent on oil from Africa and the Middle East. Unfortunately the macroeconomic implications of these anticipated new energy supply imbalances on cash surpluses from resource based economies in Africa and the Middle East for buying goods and services produced in the U.S. and China are not known precisely.

Again, the International Association for Energy Economics (IAEE) prides itself on advancing the knowledge, understanding, and application of economics across all aspects of energy policy issues and problems that may emerge from the new energy reconfiguration. IAEE facilitates information flow on these energy issues amongst energy professionals in government, industry, and academia by providing leading edge publications—The Energy Journal and Economics of Energy and Environmental Policy and organizing and/or endorsing international and regional Conferences. Thus, it is with great pleasure for me to remind you of the 37th IAEE International Conference in New York on June 16-18, 2014. I understand we received over 760 abstracts for the Conference making New York Conference abstracts the highest ever in the history of IAEE. It will certainly be an IAEE Conference to remember. For more information, please see the Conference website located at http://www.usaee.org/usaee2014/.

I also want to bring to your attention the other IAEE endorsed or sponsored Conferences in 2014. The 4th IAEE Asian Conference will be held in Beijing, China on Sept 19-21, 2014. The theme of the Conference is Economic Growth and Energy Security: Competition and Cooperation. In addition, the 14th IAEE European Conference is slated to be held on October 28-31 in Rome, Italy. The theme of the Conference is Sustainable Energy Strategies for Europe. IAEE is determined to strengthen these established IAEE (continued on page 2)
President’s Message (continued from page 1)

Conferences with a view to increasing attendance and improving quality and relevance. I certainly look forward to your attending these forthcoming IAEE Conferences in 2014.

Finally, IAEE strategic goal to grow IAEE membership across each of its three main membership categories—academia, business, and government—is very important to me personally. The ongoing campaign is to grow IAEE membership through affiliate expansion especially in regions where IAEE is underrepresented and individual members in places with no registered affiliate. Thus, it gives me great pleasure to inform you that outcomes of the just concluded IAEE endorsed NAEE Conference in Nigeria, in terms of attracting new membership and maintaining good press coverage of IAEE sponsored or endorsed Conferences, reinforce the justification of this strategic goal. The theme of the NAEE Conference was Energy Access and Economic Development: Options for Africa wherein several influential energy professionals have joined IAEE for the first time. Thus, I want to appeal to all IAEE members to help attract new members from academia, industry, and government to join IAEE worldwide. Members from academia also need to persuade their students/colleagues to join IAEE and provide students information on IAEE. IAEE student membership needs to grow significantly to ensure our sustainability. I am a living witness.

Cheers and I look forward to welcoming you to IAEE Conference in New York on June 15, 2014!

Wumi Iledare

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Want to show you are a member of IAEE? IAEE has several merchandise items that carry our logo. You’ll find polo shirts and button down no-iron shirts for both men and women featuring the IAEE logo. The logo is also available on a baseball style cap, bumper sticker, ties, computer mouse pad, window cling and key chain. Visit http://www.iaee.org/en/inside/merch.aspx and view our new online store!

IAEE Mission Statement

The International Association for Energy Economics is an independent, non-profit, global membership organisation for business, government, academic and other professionals concerned with energy and related issues in the international community. We advance the knowledge, understanding and application of economics across all aspects of energy and foster communication amongst energy concerned professionals.

We facilitate:

• Worldwide information flow and exchange of ideas on energy issues
• High quality research
• Development and education of students and energy professionals

We accomplish this through:

• Providing leading edge publications and electronic media
• Organizing international and regional conferences
• Building networks of energy concerned professionals
Editor’s Notes

We continue our coverage of Energy Poverty in this issue, but first offer a fascinating article on how energy policy, set with the best of intentions, can go wrong. This is followed by an article on merger and acquisitions in the U.S. oil and gas industry. We will conclude our reporting on Energy Poverty in the next issue.

David Howell writes that nowhere have the costs, conflicts and flaws in European energy policy been more sharply reflected and amplified than in the UK. He notes that Britain should be superbly placed energy-wise and policy should be pushing her forward. Instead energy policy has gone badly wrong and is holding her back as is true of Europe as a whole. The green transition as now structured is a delusion on a grand scale with chaos the result. It needs to be redirected.

Kuang-Chung Hsu, Michael Wright, & Zhen Zhu report on the patterns in recent M&A activities in the U.S. oil and gas industry. They examine where most of the M&A activities took place, with special regard to the shale plays where E&P activities occurred quite significantly. They also investigate the possible changing patterns in foreign direct investment. And finally, briefly examine the factors that drove recent M&A activities in the industry.

Norberto Pignatti, Irakli Galdava and Giorgi Kelbakiani note that the infrastructure of the Republic of Georgia was seriously damaged after the breakup with Soviet Union. As a consequence, a substantial share of the population lost access to modern energy services. Despite the substantial improvements in the last decade, expanding the access to modern energy services remains a priority.

Lynne Chester reports that one of the proclaimed benefits of electricity sector restructuring was to be lower consumer prices. In reality households are not paying lower electricity prices but have experienced substantial increases. As a result the energy-impoveryed population has been growing and in Europe is estimated at 150 million. She explores the increasing unaffordability of energy for households and the consequences.

Joseph Ayoola Omololaibi points out that the real energy crisis is that of energy poverty; that almost a third of humanity have no electricity, the majority of whom live in Africa. He lays out the barriers facing this problem and then provides a way forward.

Giorgio Gualberti, Morgan Bazilian and Todd Moss provide an assessment of the U.S., European and Chinese development finance and foreign direct investments for the energy sector of Sub-Saharan Countries.

DLW

Newsletter Disclaimer

IAEE is a 501(c)(6) corporation and neither takes any position on any political issue nor endorses any candidates, parties, or public policy proposals. IAEE officers, staff, and members may not represent that any policy position is supported by the IAEE nor claim to represent the IAEE in advocating any political objective. However, issues involving energy policy inherently involve questions of energy economics. Economic analysis of energy topics provides critical input to energy policy decisions. IAEE encourages its members to consider and explore the policy implications of their work as a means of maximizing the value of their work. IAEE is therefore pleased to offer its members a neutral and wholly non-partisan forum in its conferences and web-sites for its members to analyze such policy implications and to engage in dialogue about them, including advocacy by members of certain policies or positions, provided that such members do so with full respect of IAEE’s need to maintain its own strict political neutrality. Any policy endorsed or advocated in any IAEE conference, document, publication, or web-site posting should therefore be understood to be the position of its individual author or authors, and not that of the IAEE nor its members as a group. Authors are requested to include in an speech or writing advocating a policy position a statement that it represents the author’s own views and not necessarily those of the IAEE or any other members. Any member who willfully violates IAEE’s political neutrality may be censured or removed from membership.
The relationship between economic growth and energy becomes ever more important as economies around the world struggle to reinvigorate themselves and to develop energy resources in sensible, sustainable ways. Can economic growth be stimulated even with pressure to reduce if not forego certain forms of energy for environmental or safety reasons? Alternatively, can oil, gas and other energy development be a major force that stimulates economic growth? What policy framework would maximize the contribution of energy to growth while encouraging efficient substitution of sustainable for less sustainable sources?

The 37th IAEE International Conference, taking place in New York City in 2014, will focus on these and related issues. New York is the financial center of the United States, a place where multi-billion dollar bets are laid on future economic growth and on energy technologies, and therefore a place where analysis of subjects like these is constantly in demand. Some of the very best minds in energy economics in the world will assemble there for what promises to be one of the best IAEE Conferences ever. Economists from a number of countries will examine questions related to energy and the economy from a wide variety of perspectives. High level policy makers will talk about the challenges they face, while analysts will offer practical, evidence-based approaches to meeting such challenges. The agenda will be filled with top-notch speakers plus 3 days of concurrent sessions, places where the results of specific topical research will be presented and absorbed.

The conference also will offer networking opportunities through informal receptions, breaks between sessions, and student recruitment. These provide opportunities for attendees to renew acquaintances and to forge new ones. There will be special events for students, including paper, poster and case competitions. And as usual, an outside event will spice the conference agenda. If that weren’t enough, New York City offers a myriad of cultural attractions from museums to musical, dramatic and athletic performances. Not to mention some of the best shopping in the entire world. It’s a conference program and a venue not to be missed.

Topics to be addressed include:
The general topics below are indicative of the types of subject matter to be considered at the conference. A more detailed listing of topics and subtopics can be found at: www.usaee.org/usaee2014/topics.html

- Energy Demand and Economic Growth
- Energy Supply and Economic Growth
- Financial and Energy Markets
- Energy and the Environment
- Non-fossil Fuel Energy: Renewables & Nuclear
- International Energy Markets
- Energy Efficiency
- Energy Research and Development
- Political Economy of Energy
- Public Understanding of and Attitudes towards Energy
- Other topics of interest include new oil and gas projects, transportation fuels and vehicles, generation, transmission and distribution issues in electricity markets, etc.
PLENARY SESSIONS

The 37th IAEE International Conference will attract noteworthy energy professionals who will address a wide variety of energy topics. Plenary sessions will include the following:

- International Implications of U.S. Energy Renaissance
- Energy & The Economy
- Renewables, Power Prices, and Grid Integration
- International Shale Development: Prospects and Challenges
- Transportation Developments
- Oil & Gas Reserve Valuation & Financing
- Climate Change and Carbon Policies – International Lessons and Perspectives
- Energy Financing
- Utility Business Model
- Global Energy Demand Growth

Travel Documents

All international delegates to the 37th IAEE International Conference are urged to contact their respective consulate, embassy or travel agent regarding the necessity of obtaining a visa for entry into the U.S. If you need a letter of invitation to attend the conference, visit www.usaee.org/usaee2014/invite.aspx

The conference strongly suggests that you allow plenty of time for processing these documents.

SPEAKERS INCLUDE:

- Douglas Arent
  Executive Director, JISEA, National Renewable Energy Lab
- Jason Bordoff
  Director, Center on Global Energy Policy, SIPA, Columbia University
- Michael E. Canes
  Distinguished Fellow, Logistics Management Institute
- A. Denny Ellerman
  Part-time Professor, European University Institute
- David Hobbs
  Head of Research, KAPSARC
- Ralph Izzo
  Chairman, President and CEO, Public Service Electric and Gas
- Amy M. Jaffe
  Executive Director, Institute of Transportation Studies, UC Davis
- Steffen Jenner
  Policy Advisor, Ecotys Consultancy
- John W. Jimison
  Managing Director, Energy Future Coalition
- Lutz Kilian
  Professor of Economics, University of Michigan
- David H. Knapp
  Managing Director Energy Research Advisor, Energy Intelligence Group
- Prakash Loungani
  International Monetary Fund
- Robert Maguire
  Partner, Parella Weinberg Partners
- Kenneth B. Medlock III
  Senior Director, Center for Energy Studies, Baker Institute, Rice University
- Edward Morse
  Managing Director and Global Head – Commodities, Citi Research
- Karsten Neuhoff
  Head of Department, DIW Berlin
- David M. Newbery
  Director, EPRG, University of Cambridge
- Karen Palmer
  Senior Researcher, Resources for the Future
- Ricardo B. Raineri
  Alternate Executive Director – LA, The World Bank Group
- Surya Rajan
  Director, Strategy, Baker Hughes
- Thibault Remoundos (invited)
  Morgan Stanley & Co International plc
- Christof H. Ruehl
  Group Chief Economist and Vice President, BP plc
- Benjamin Schlesinger
  President, Benjamin Schlesinger & Assoc LLC
- Jigar Shah
  Founder, SunEdison LLC
- Adam E. Sieminski
  Administrator, Energy Information Administration
- Katherine Spector
  Head of Commodities, CIBC World Markets
- Mauricio Tolmasky
  President, EPE (Empresa de Pesquisa Energética), Brazil
- Jose Maria Valenzuela
  Director de Sustentabilidade Energética, Secretaria de Energia, Government of Mexico
- Dymphna van der Lans
  Senior Director for Public Policy Programs, German Marshall Fund of the United States
- Juan Miguel Velasquez
  Associate, World Resources Institute
- Christian von Hirschhausen
  Professor of Economics, TU Berlin
- Eirik Wærness
  Chief Economist, Statoil ASA
- Zhang Xiliang
  Professor and Executive Director of the Institute of Energy, Environment and Economy, Tsinghua University
- Sonia Yeh
  Research Scientist and Lecturer, University of California, Davis
- Mine Yucel
  Vice President & Sr Economist, Federal Reserve Bank of Dallas
- Anthony Yuen
  Director and Global Energy Strategist, Citi Research

Visit Our Conference Website at www.usaee.org/usaee2014/
In today’s economy you need to keep up-to-date on energy policy and developments. To be ahead of the others, you need timely, relevant material on current energy thought and comment, on data, trends and key policy issues. You need a network of professional individuals that specialize in the field of energy economics so that you may have access to their valuable ideas, opinions and services. Membership in the IAEE does just this, keeps you abreast of current energy related issues and broadens your professional outlook.

The IAEE currently meets the professional needs of over 3400 energy economists in many areas: private industry, non-profit and trade organizations, consulting, government and academe. Below is a listing of the publications and services the Association offers its membership.

- **Professional Journals:** *The Energy Journal* is the Association’s distinguished quarterly publication published by the Energy Economics Education Foundation, the IAEE’s educational affiliate. *Economics of Energy & Environmental Policy* is a new journal published twice a year. Both journals contain articles on a wide range of energy economic and environmental issues, as well as book reviews, notes and special notices to members. Topics addressed include the following:
  
  - Alternative Transportation Fuels
  - Conservation of Energy
  - Electricity and Coal
  - Emission Trading
  - Energy & Economic Development
  - Energy Management
  - Energy Policy Issues
  - Energy Security
  - Environmental Issues & Concerns
  - Hydrocarbons Issues
  - Markets for Crude Oil
  - Natural Gas Topics
  - Natural Resource Issues
  - Nuclear Power Issues
  - Renewable Energy Issues
  - Sustainability of Energy Systems
  - Taxation & Fiscal Policy

- **Newsletter:** The IAEE *Energy Forum*, published four times a year, contains articles dealing with applied energy economics throughout the world. The Newsletter also contains announcements of coming events, such as conferences and workshops; gives detail of IAEE international affiliate activities; and provides special reports and information of international interest.

- **Directory:** The Online Membership Directory lists members around the world, their affiliation, areas of specialization, address and telephone/fax numbers. A most valuable networking resource.

- **Conferences:** IAEE Conferences attract delegates who represent some of the most influential government, corporate and academic energy decision-making institutions. Conference programs address critical issues of vital concern and importance to governments and industry and provide a forum where policy issues can be presented, considered and discussed at both formal sessions and informal social functions. Major conferences held each year include the North American, European and Asian Conferences and the International Conference. IAEE members attend at reduced rates.

- **Proceedings:** IAEE Conferences generate valuable proceedings which are available to members at reduced rates.

To join the IAEE and avail yourself of our outstanding publications and services please clip and complete the application below and send it with your check, payable to the IAEE, in U.S. dollars, drawn on a U.S. bank to: International Association for Energy Economics, 28790 Chagrin Blvd., Suite 350, Cleveland, OH 44122. Phone: 216-464-5365.

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**Yes,** I wish to become a member of the International Association for Energy Economics. My check for $100.00 (U.S. members $120 - includes USAEE membership) is enclosed to cover regular individual membership for twelve months from the end of the month in which my payment is received. I understand that I will receive all of the above publications and announcements to all IAEE sponsored meetings.

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Energy Fiasco

By David Howell*

For politicians and the policy-making world, energy issues have a particular characteristic. They lie quiescent for long periods while society enjoys, indeed takes for granted, plentiful and uninterrupted supplies of fuel and power at reasonable cost. Then suddenly, like a sleeping snake uncoiling, they leap up and grab government by the throat, disrupting everyday life and economic activity, generating unforeseen collateral damage and threatening the very survival of governments. Such a time has recently arrived for a number of governments, especially in Europe and particularly in Britain.

The decision by the European Commission to propose new and less rigorous targets in the drive for a low carbon energy environment reflects the belated awareness that previous energy policies in Europe have now become unsustainable. The very high energy and electricity costs – far higher than originally anticipated – which resulted from Europe’s earlier ambition to lead the world in a green transition have proved too damaging to the region’s industry and too harsh on consumers. With Europe still struggling with flat growth and record high unemployment, the pace of energy transition has had to be slowed.

Nowhere have the costs, conflicts and flaws in European energy policy been more sharply reflected and amplified than in the UK – although severe problems in Germany have come a close second.

Britain is, or ought to be, superbly placed when it comes to energy, as well as highly attractive to new investors in energy generating plant, transmission systems and, on the demand side, in energy efficient machinery and consumer products.

It has vast resources of coal (much of it ready for gasification offshore), still plentiful North Sea gas and oil – declining but still substantial – and neighbours clamouring to sell it more piped gas – especially Norway but also Russia via its proposed branch line from Nordstream to East Anglia – as well as a very large on-shore shale gas potential. It has suppliers round the world eager to ship more frozen gas (LNG), excellent and growing facilities to receive LNG and transmit it into the high quality UK gas grid which is fully ready to receive it. It has plenty of wind and tide potential, long and deep civil nuclear experience (despite the setbacks of the last century), top quality skills and innovative power both in conventional oil and gas development, production and transmission, and in green and energy efficient technologies.

All this cornucopia ought to be the ideal recipe for utterly reliable low-cost sustainable energy supplies for powering the British economy for ages to come, and for well heated and comfortable homes for the British people indefinitely into the future at modest cost. Energy policy should be pushing Britain forward, not holding it back.

Yet something is badly wrong. Instead of energy plenty and cheap reliable power supplies, we have the opposite, an energy imbroglio with uncertainty, eye-watering price increases and real fear of power failures stalking the scene. British energy prices are said to be some of the highest in Europe and the world, and set to rise higher still. Britain’s energy policy ought to be the least controversial and smoothest running part of government. Instead it is locked into out-of-date commitments and strategies, broadly labelled ‘The Green Transition’ and largely dictated and corralled by equally dated EU energy policy requirements.

The result is delusion on a grand scale, and chaos.

Investment in new power generation at the required level is not occurring; power shortages, interruptions and black-outs are in prospect; carbon reduction targets will not be reached; energy costs are internationally uncompetitive; energy prices are stupidly high and fuel poverty is at record levels; the attempt to reincarnate the nuclear power programme is once again faltering; the environment is being desecrated (a true irony when the main Green objective is supposed to be to protect our environment); more coal is being burnt than ever (another irony and direct result of Green policies); participation in the shale gas and oil revolution is hesitant; world-wide British involvement in the effects of this revolution, and in its transforming impact on the whole global energy ought to be much greater, given British North Sea experience and with two of the biggest energy companies in the world on British shores.

Despite being highly favourably placed to enjoy secure and cheap energy supplies for years to come current policy has set Britain in the opposite direction, towards insecurity, higher and higher costs, greater pollution and massive environmental damage – an astonishing counter-achievement.

* Lord Howell is a former Secretary-of-State for Energy (i.e., the UK Energy Minister, 1979-81), Secretary-of-State for Transport, 1981-83) and previously the Minister of State in the Northern Ireland Office (1972-74). More recently, he has been until mid-2013 Minister for the Commonwealth in the Foreign and Commonwealth Office and simultaneously Minister for International Energy Security. During these appointments he was, of course, not permitted to express his own private views on UK or energy policy. While Minister of Energy in 1979, he helped found the British Institute of Energy Economics (BIEE) and has just completed a 9-year (maximum) term as President (2004-2013) This article is based on an extract from Lord Howell’s latest book, Old Links and New Ties: Power and Persuasion in an Age of Networks. See footnotes at end of text.
British energy policy-makers and commentators speak of an energy ‘trilemma’. The need, they say, is to reconcile three key objectives in this field – affordability, reliability and security of supply and environmental objectives (namely decarbonisation targets).

Regrettably the record is one of failure on all three fronts. High and ever-rising prices are causing dismay amongst both domestic and industrial consumers; power shortages and possible cuts are being widely forecast and green, or low carbon, objectives are not being genuinely met.

How can Britain sort out its energy future as it struggles to find a way through all these dilemmas, or this so-called trilemma, of reconciling cost and security of supply with green and low carbon objectives? A confident nation, on the forward foot internationally, needs sound energy and power. Despite the present muddle there is a pathway out to a much safer, cheaper and altogether more reliable future.

Out of the Imbroglio

The gateway to a better route comes surely though acceptance of a new and different approach to the green economy goal. The real green transition will come not through higher energy prices but through lower ones. Once cleaner power sources become cheaper than coal, oil or gas, the market will work and the consumer will switch away from higher cost fuels to low carbon energy sources on a massive scale, but not before.

The driver for lower costs is, of course, technical innovation. It is new, cleverer and cheaper ways of harnessing wind power, solar power, wave power and nuclear power and bringing down the costs of providing power from these sources which will motivate change. Public resources should, therefore, be heavily focussed on promoting research and innovation and cost-saving technical advances in all the renewable areas, rather than on subsidising already installed high-cost renewables, such as wind farms.

The key is new technology. Public support ought to focus on research and development on every part of the power supply chain from power generation, to power transmission, to power distribution and to efficiency in power consumption. Make all these things cheaper, and they will be adopted. Make and deliver more electricity out of a tonne of coal, a barrel of oil, a therm of gas, make better transmission lines which lose less power along the way, and the investment will be forthcoming. Make energy saving equipment in the factory or office, and energy saving items in the home, cheaper and more efficient and they will be installed and used.

Exactly the opposite approach now prevails in British energy policy. It is to make energy supplies more expensive, based on the theory that high energy costs will lead to more energy saving expenditure and one day lower bills. It is to support and subsidise not research and innovation but actual operation of lower efficiency and very costly renewable energy installations, especially wind farms. Subsidising high cost wind farm operations is, of course, a direct disincentive to look for cheaper methods and better technologies. If the returns are flowing in, what is the point of shifting to new machinery? If wind farms can be built and operated in ways which pull in large subsidies, whether paid for by the taxpayer or the already burdened consumer, where is the case for tiresome efforts to find new technologies and installing new systems?

But if high subsidies to inherently non-commercial renewable energy systems discourage innovation they also have a further, other killer feature. This is that subsidising renewable energy undermines investment in new fossil fuel power plants, however efficient, however effective in reducing carbon emissions, however necessary in replacing old and dirtier generating equipment and power stations.

The new investment in gas turbines will not take place. The green cards are stacked against energy investors. At the time of writing only one gas-fired plant is under construction out of at least thirty promised and needed to replace old coal burning stations. These old plants will have to be repaired and their life stretched. Coal-fired plants will be kept burning away, and new ones may even be built (as is happening in Germany), especially if coal supplies are plentiful and cheap and especially if even cheaper coal is on offer from the United States, where the switch to cheap gas on a vast scale has left coal suppliers eager to find new markets.

Thus, perversity of perversity, heavily subsidised renewables deter new gas-fired turbines, however much carbon they save, leaving more coal-burning to fill the gap.

But if that is not bad enough – and, of course, dangerous enough, since it imperils future energy security, as well as climate security – there is a further strong negative factor at work. High ‘green’ subsidies (in fact barely green at all) have to be paid for. Consumers and taxpayers have to foot the bill. In an era when taxes are already high, when living standards are being squeezed and when energy costs are already far above historical levels anyway, policies to raise them further are guaranteed to produce very strong reaction and resistance. Hardest hit are the poorest families in their millions. Ever bigger sums
have to be carved out of weekly household budgets to pay the subsidies which well-endowed wind farm operators enjoy. The transfer is from the poor to the rich on a substantial scale. It is an un-saleable political message, running counter to the best ideals in all political parties. The green cause, at first so broadly supported and popular, has become discredited and unpopular. Incompetent handling and messaging is betraying the good green case.

The Green Transition was originally a scenario drawn up in 2009 by the UK’s gas and electricity regulator, Ofgem. A price was put on it of £240 billions. One estimate is that the effect on average household energy bills will be to rise them from 2012’s £1243 to 2020’s £4733 — in real terms. In practice the Green Transition will prove impossible to deliver. Consumers are not going to pay these sums and will vote against the Government that tries to impose them. The investing companies, the Big Six and the National Grid, will not be able to afford the investment involved. The problems of balancing electricity supply with the enormous wind power element involved (some 30 percent supply capacity) will be unmanageable. A massive countryside reaction against the cat’s cradle of new grid pylons, wind pylons, switching stations and supporting road infrastructure, led by environmentalists from both left and right politically, will make progress impossible. Above all, the widening availability of gas, driven by the shale phenomenon, will make the very high cost of renewable supplies and technology, un-financeable.

A little further ahead lies the need for Britain to renew its outworn nuclear power fleet of generating stations. But the timing of new nuclear investment needs to be carefully dovetailed with the now prolonged age of gas which seems likely to fill at least the next decade or more. With the major expansion of gas availability through shale gas the ‘stepping stone’ nature of the gas era becomes greatly extended as part of the pathway to low carbon.

The deal agreed between EDF (Areva) and the British Government to build two new reactors of 1300 megawatts each at Hinkley Point, and possibly two more at Sizewell in Suffolk, does not seem to fit into this necessary sequencing. Unless and until the shale gas revolution collapses — which appears extremely unlikely for decades ahead — and the natural gas price then soars in all regions, the subsidy element for new nuclear, expressed through agreeing a strike price for the electricity generated from the new plant for thirty-five years ahead at a level roughly twice the present average generating cost (£92.50 per megawatt hour as opposed to a current £50 per megawatt hour) remains exorbitant.

By implication it appears that those who have struck the Hinkley deal want to by-pass the gas age completely, keep gas prices high, discourage gas turbine building and leap frog prematurely into the first available nuclear deal at hand. Other, cheaper and more reliable technologies, such as the Advanced Boiling Water Reactor, (already in a number of places up and running reliably) are coming along. They will take longer to licence but a wait might anyway have been prudent.

Such is the price, and behaviour pattern, of zealous policy-makers who, having opposed and delayed new nuclear power stations for too long, suddenly realise that low carbon objectives cannot possibly be replaced without nuclear power and have rushed with the zealotry of converts, to the first available nuclear project on offer — a European one with Chinese financial support (which may lead to direct managerial involvement later).

Confusion is added still further by the policy schizophrenia of the main British Opposition Party, the Labour Party, which could conceivably gain power a year hence — when it argues both for the high-price green regime, with its heavy taxes and levies on all fuel, and at the same time for a freeze on all energy company charges — leaving would-be investors in new plant utterly confused.

The Wider Energy Scene

The wider European energy scene provides the context for all that is happening, and going wrong, on the domestic British energy front. The British imbroglio is part and parcel of an even greater confusion at the European level. It should not be so, but it is.

The measures and legislation enacted to ‘deliver’ the EU energy targets, although now modified, will still achieve none of their objectives. They are based on delusion. Greenhouse gases will not be curbed globally; in net terms, jobs are being lost on a major scale, not increased, as European industrial energy costs soar and investment goes elsewhere; renewable energy targets will not be met. Indeed, the ‘dirtiest’ of all fossil fuels, coal, is gaining a dominant role in European power generation.

All this is turning out to be a stupendous error, and a costly and hurtful error at that. Had the famous American historian Barbara Tuchman, author of *The March of Folly*, lived on into the present age this could well have been one of the milestones in her historical record of grand scale establishment folly. At root, Europe’s well-intentioned policy makers have been fed with bad guidance leading them to believe that greenhouse gases can be controlled, and global warming curbed, relatively cheaply, straightforward-
ly and quite swiftly. It turns out that the costs of transforming energy systems to more sustainable patterns are proving far higher than predicted by experts and the gains far more ambiguous and indefinite.

As I argued in a book co-authored with Dr. Carole Nakhle in 2007 the appeal to consumers to pay painful extra costs to save the planet at some distant future date would not be sufficient. The message was wrong. A far more compelling theme would have been that it was future energy security that necessitated a shift to low carbon power and that green technologies could, in due course, and including nuclear power, produce cheaper instead of painfully more expensive energy supplies, as well as safer and more reliable power sources. The Al Gore appeal – that saving the planet required sacrifice now, and that the science of imminent doom was settled beyond dispute, was never going to carry enough people with it. Vague, weak and implausible messages were always going to produce bad results, and this has proved to be the case. Intense hostility has now built up against the green cause.

A Government in Britain which wanted to be ‘the greenest government ever’ has found itself on the defensive and on the retreat over its energy pricing policies. Two further problems are undermining the green case.

Britain should be campaigning vigorously to change the direction of the EU Commission’s ineffective and catastrophic policies. The focus of European energy policy needs to be on energy market liberalisation and on a much expanded infrastructure of gas and electricity pipelines and connectors to ensure reliability and avoid power breakdowns. This approach should be folded into the broader case for EU reforms which the British Prime Minister has been pressing and which millions of European citizens now long for.

The twin hearts of the problem are two EU directives, both now badly out of date. One, the EU Large Combustion Plants directive, requires the rapid closure of many older power stations, regardless of the risks to supply security. The other is the EU Renewables directive compelling Britain to generate at least 15 percent of its total energy from renewables (defined not to include nuclear power) – a requirement which effectively means that the electricity generating sector will have to find 30 percent from renewable sources. Hence the enormous drive to promote and subsidise high-cost wind farms to meet growing energy needs.

It does not add up. Renewables cannot conceivably meet basic energy needs in advanced industrial societies, as everyone knows. The targets are pure wishful thinking. Those who entrusted their political leaders in Europe with the task of supervising a great transformation to an age of cleaner, safer, greener and more affordable energy have been betrayed and are entitled to be angry. Instead of ‘stumbling towards crisis’, in the words of Dieter Helm, Oxford Professor of Energy, a confident British nation should be leading Europe away from crisis and towards green policies which are viable, affordable and assist economic recovery.

High cost energy, mishandled energy transition and misguided EU policies are holding Britain back and preventing it from making full use of its immense network advantages. They tie a boulder to the foot of the runner in the global race. They damage the green cause, weaken industrial success and undermine competitiveness. In the new phase, as Britain struggles to compete harder than ever before, the boulder must be lifted off the runner and left behind.

Footnotes

1 The most recent estimate at the time of writing is that seven million UK families face fuel poverty, and over half all households owe money to their energy suppliers.

2 Figures from the Price Comparison website Uswitch.com My latest electricity bill shows that Government obligations and taxes, including green levies, now add 20 percent to my monthly bill.

Merger and Acquisition Activities in the U.S. Oil and Gas Industry

By Kuang-Chung Hsu, Michael Wright and Zhen Zhu*

In the last several years, the U.S. oil and gas industry has experienced some significant changes. From 2006 to 2013, the WTI oil price increased from $66.05/Bbl to about $95/Bbl, where it remains today. The Henry Hub natural gas price increased from $6.73/MMBtu in 2006 to $8.86/MMBtu in 2008, before it dropped to below $3 in 2012. Towards the end of 2013, gas prices started to increase to more than $4, driven by an abnormally cold December unseen in recent years. During this eight-year period, the economic development around the world, in particular the economic growth in the Asian countries such as China and India, has been the driving force behind the significant oil price increases. However, since the U.S. gas market is still largely driven by domestic supply and demand factors, U.S. gas prices have been insulated from the same world events that have impacted oil prices; the outcome of which reveals a relative diverging price movement – oil prices have increased and remained high, while gas prices have tanked as domestic production ramped up in the presence of a tepid domestic demand, thanks to mild weather.

In general, the U.S. oil and gas market is still broadly impacted by world economic forces. The financialization of the commodity market in the early years of the eight-year period (2006 to 2013) helped fuel rapid growth in oil and gas prices in the U.S. The recession experienced by several world economies reduced the demand for oil and gas and depressed prices significantly. On the investment front, as the world financial markets are more integrated than ever before, international financial flows have helped drive investment activities in the U.S. On one hand, as oil prices continued to increase and some national oil companies continued to seek overseas investment opportunities, we would expect some level of investment activity in the U.S. oil and gas industry to be driven by international capital flows.

In this article, we take a look at the more recent evidence in the merger and acquisition activities in the U.S. oil and gas industry, so that we might gain a better understanding of the trend and possibly account for the reasons behind the changes in the trend. We examine a number of M&A transactions in the U.S. oil and gas industry over time and by location. In addition, we look at the M&A transactions involving foreign investors. A preliminary look at the factors that have been driving more recent M&A trends in the oil and gas industry will be provided.1

Recent Trend in M&A Activities in the U.S. Oil and Gas Industry

There was a general upward trend in M&A transactions in the U.S. oil and gas industry. Figure 1 plots the number of M&A transactions for the period of 2006 to 2013. The total number of transactions increased quite rapidly from 2006 to 2008. However, the recession took a toll on M&A and the number of transactions, declined in 2009, before rising in 2011. During 2012 and 2013, the total number of transactions continued its declining path, dropping from a high of 862 transactions in 2011 to 582 transactions in 2013. This general trend appears to be consistent with overall economic conditions, as well as the circumstances surrounding the oil and gas industry. The early increase in the number of transactions may also be due to the financialization of the commodity market, when a large amount of capital was poured into the oil and gas industry. The onset of the recession and tightening of credit appear to have depressed the M&A transactions temporarily before the oil and gas sector heated up again. This is especially true for the time period between 2009-2010, when E&P activities in several major shale plays started to generate heightened interest in investment in oil and gas properties in those areas.

In terms of the value of the transactions, though, there were a number of

* Kuang-Chung Hsu is an Assistant Professor of Economics, Michael Wright is an undergraduate economics student, and Zhen Zhu is the Mike Metzger Professor of Economics at the University of Central Oklahoma. Professor Zhu is also a Consulting Economist with C.H. Guernsey & Company in Oklahoma City. Financial support from University of Central Oklahoma is gratefully acknowledged. See footnotes at end of text.
transactions that involved several billion dollars, the majority of the transactions involved were below $300 million. Table 1 shows the percentage of the transactions below $300 million accounted for more than 85% of the total transactions that reported a value.

**Locations of the Transactions**

While most regions saw some transactions, most of the transactions have been concentrated in a few major areas. Figure 2 shows the percentage of the M&A transactions occurring in each region for 2013. The Gulf Coast and Midcontinent regions, the two areas that are traditionally oil and gas producing regions, had the largest number of transactions, totaling almost 50% of all transactions that reported specific locations. The Rockies and Permian Basin regions ranked third and fourth, each accounting for 13% and 11% of total transactions, respectively. Together, these four regions accounted for about 75% of total M&A activity.

One might be curious as to where these transactions took place within each of the regions, especially given the booming shale oil and gas production in recent years. Figure 3 shows the number of transactions reported by the specific shale plays. Several patterns can be noted from the two following charts. The number of transactions generally followed an increasing trend pattern in the aggregate number of transactions, until 2011, followed by a declining trend thereafter. The Bakken (the Rockies), Permian (West Texas) unconventional, and Eagle Ford (South Texas) regions witnessed the largest number of transactions in shale plays. During this time period between 2008-2011, there were some booms in the Haynesville shale play. However, the number of transactions in Haynesville Shale have essentially dried up in the last two years, reflecting the fact that the E&P cost in the play is higher than the costs in other areas; therefore, investment has moved to other areas, where exploration and production are more profitable.

Among the various shale plays, the Marcellus play saw a rapid increase in M&A transactions starting in 2008. The timing coincided with the production pattern in the area. Between 2009-2012, Marcellus Shale experienced rapid production expansion and the number of M&A transactions showed the same pattern.

There are some interesting patterns shown in the Utica Shale and Mississippian Lime areas as well. The transactions started to appear in the Utica area in 2011 and continued to 2013. The time of these transactions coincided with the beginning of the oil and gas boom in the Utica Shale. While the Utica Shale is more well known, the Mississippian Lime play is a lot less recognized – most people probably could not pinpoint the area on a map. However, this lime play in North/Central Oklahoma has received the same amount of attention from oil and gas investors as in other plays. There has been a burst of M&A activity in more recent years in this area, highlighted with some joint venture activities between Chesapeake Energy and Chinese oil and gas investors.

The same is true with the Niobrara region in Northern Colorado and adjacent Wyoming, Nebraska and Kansas. Though Niobrara is mainly an oil play, it is still in the early stage of leasing and development and is technically not considered a shale play. Niobrara has emerged as one of the hottest liquid-rich plays due to its reserve and production potential, which has attracted investors to acquire properties and drilling rights.

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**Table 1: M&A Transaction by Value**

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<tr>
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<td>3000-4000</td>
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<td>1</td>
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<tr>
<td>Grand Total</td>
<td>4338</td>
</tr>
</tbody>
</table>

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**Figure 2: Locations of Oil and Gas M&A Transactions**
One of the strategies of the National Oil Companies is to develop property interest in foreign countries, as they may face limited investment opportunities domestically. However, we do not observe any increasing trend in foreign investors investing in the U.S. oil and gas industry. Figure 4 plots the percentage of U.S. oil and gas M&A transactions in which only foreign buyers were involved in recent years and the numbers indicate that these...
percentages stayed around 20%, with the maximum reached in 2008.

Though there is not a significant trend in the number of transactions involving foreign entities alone, there is an upward trend in the number of buying transactions involving joint ventures between the U.S. and foreign investors in more recent years, even though the percentage has not reached the 25% level since 2006 (Figure 5). As Table 2 indicates, the total percentage of M&A transactions involving foreign buyers fluctuated around 40%. 2009 had the smallest percentage (29.5%) as the world economy was experiencing economic difficulties, followed by a decline in transactions in the years leading up to 2008. Now it appears that foreign investment in the U.S. oil and gas industry has continued to grow, with 2013 observing a rebound to almost 40%.

Even though the percentage of the transactions involving a foreign entity could tell a story as to how foreign interest is fueling the U.S. shale play boom, the number of transactions itself does not necessarily reveal the complete story. One of the reasons for this is that sometimes, when a foreign interest is involved, one single large transaction could outweigh many smaller domestic transactions combined in terms of the transaction value. For example, in 2013 Chesapeake Energy signed a deal with China’s Sinopec for over a billion dollars. A year earlier, Chesapeake’s cross-town neighbor, and another energy company in Oklahoma City, Devon, penned a deal with Sinopec for over 2 billion dollars.

What Drives U.S. Oil and Gas M&A Transactions?

Many factors may be behind the M&A transactions in the U.S. oil and gas industry in recent years. At the firm level, strategic considerations, operating and financial conditions, capital budget constraints, reserve, and production situations all impact a company’s decision to buy or sell oil and gas properties. At the more aggregated level, the price of oil and gas is a more important consideration, as the prices move and the expectation of future price movement determines the returns on investment. During the period of 2006 to 2013, oil and gas prices moved
synchronously in earlier years, but diverged in later years (see Figure 6). The examination of the U.S. oil and gas M&A activities and their prices suggest that mainly oil prices, rather than gas prices, have been driving the M&A transactions.

A simple statistical analysis suggests that the oil price and M&A activity are correlated, but gas price and M&A activities may be associated with each other for the first half of the period, but not for the period as a whole. For example, the overall correlation between oil price and the number of oil and gas M&A transactions is 0.714 for the whole sample period, but only -0.498 between the gas price and M&A transactions. For the earlier period, 2006-2009, the correlations are 0.844 and 0.618 for the oil price and the gas price with the M&A activities, respectively. The patterns in Figure 7 suggests the same – the relationships between the oil price and M&A activity, and the gas price and M&A activity are positive, except for gas prices in the later period.

The movement of the M&A activities across geographic locations and plays is easily understood by oil and gas economics. The first mover advantage, the uncovering of vast reserves and potential production, and the drilling and production cost dynamics explain the “boom and bust” cycle of M&A transaction activities for a specific location/play. Ultimately, prices, especially the prices of oil and other liquids, provided a strong economic motivation for the oil and gas investors to engage in the M&A activities. Needless to say, the horizontal drilling technology made the E&P in the shale plays possible and profitable, enabling the booms in the oil and gas industry.

Looking forward, as opportunities in the well-known plays have arisen and went in just a few years, if some of the less well-known plays continue to follow this same pattern, the M&A activities in the U.S. oil and gas industry may subside. The current downward trend in M&A activity began in 2012, which may be the sign of a cooling down of the M&A activities in the oil and gas industry. However, as long as oil prices remain high, we will most likely see the activities trailing off gradually. Furthermore, should we see the rebound of gas prices in the medium term, we may observe another wave of M&A rushing up for another round, bringing more foreign investors onto American soil.

Footnotes

1 Most of the investment activity data was extracted from PLS (Petroleum Listing Service) Inc. Oil & Gas M&A Database.
2 Note that the data for 2013 is only up to June. The total number for 2013 was obtained by doubling the numbers reported for the first half of the year.
3 Strictly speaking, not all those listed are shale plays. For example, Mississippian Lime is not a shale play.

Careers, Energy Education and Scholarships Online Databases

IAEE is pleased to highlight our online careers database, with special focus on graduate positions. Please visit http://www.iaee.org/en/students/student_careers.asp for a listing of employment opportunities.

Employers are invited to use this database, at no cost, to advertise their graduate, senior graduate or seasoned professional positions to the IAEE membership and visitors to the IAEE website seeking employment assistance.

The IAEE is also pleased to highlight the Energy Economics Education database available at http://www.iaee.org/en/students/eee.aspx Members from academia are kindly invited to list, at no cost, graduate, postgraduate and research programs as well as their university and research centers in this online database. For students and interested individuals looking to enhance their knowledge within the field of energy and economics, this is a valuable database to reference.

Further, IAEE has also launched a Scholarship Database, open at no cost to different grants and scholarship providers in Energy Economics and related fields. This is available at http://www.iaee.org/en/students/List_Scholarships.aspx

We look forward to your participation in these new initiatives.
Beijing, China
19-21 September, 2014

Energy Economics:
New Challenges & Solutions
The 4th IAEE Asian Conference
Beijing China, September 19-21, 2014

Energy Economics: New Challenges & Solutions

We are pleased to announce that the 4th IAEE Asian Conference will be held in Beijing, China on September 19-21, 2014. We welcome you to Beijing, the capital of the People’s Republic of China, with a rich history and modern cultural developments. There are two categories of concurrent sessions: 1. academic-type energy economics research, and 2. practical case studies on current energy-related issues from government agencies or industries. Experts who are interested in organizing special tracks are encouraged to propose their topics and possible speakers.

TOPICS (including but not limited)
- Energy outlook
- Energy security
- Energy transportation and pipelines
- Regulation and deregulation
- Electricity prices and uncertainties
- Energy policy
- Non-carbon energy technologies
- Prospects for nuclear power
- Geopolitics of energy
- Smart grid and power industry deregulation
- Climate Policy and Emission Trading Scheme
- Effective CO₂ removal
- Energy efficiency
- Energy Investment
- Oil & Gas reserves and production
- Prospects for shale gas development

Sincerely we welcome you to the 4th IAEE Asian Conference in Beijing, China.

Center for Energy & Environmental Policy Research, IPM, CAS www.ceep.cas.cn
School of Humanities and Economic Management, CUGB www.cugb.edu.cn

First Announcement and Call for Papers

SUBMISSION OF ABSTRACTS
Abstracts in PDF format, maximum 2 pages in length, covering Overview, Methods, Expected results and References should be submitted via conference website iaeasia.csp.escience.cn.

VENUE
The conference will be held at the new auditorium of Chinese Academy of Sciences and the International Conference Center (GICC) of China University of Geosciences.

KEY DATES
Tracks proposal deadline: March 1, 2014
Abstracts submission deadline: April 1, 2014

CONTACT
Prof. Ying FAN (iaeAsia2014@casipm.ac.cn)
Prof. Haizhong AN (iaeAsia2014@cugb.edu.cn)
Welcome to the 4th IAEE Asian Conference

Mark your calendars!

We are very pleased to announce the 4th IAEE Asian Conference, one of the four major conferences of the International Association for Energy Economics. The conference will be hosted by the Institute of Policy and Management of the Chinese Academy of Sciences (CAS) and China University of Geosciences (Beijing) (CUGB), in Beijing on 19-21 September 2014, with accommodations at the International Conference Center of CUGB.

This will be the first IAEE conference in mainland China. With the theme, Energy Economics: New Challenges and Solutions, the conference shows breadth, in order to attract more delegates, on one hand and on the other covers practical problems in energy economics. We believe, energy demand growth caused by modernization and urbanization in Asian countries in coming decades will have significant impacts on energy security, not only in Asia, but also in the world as a whole. And, despite concern about climate change, it will be difficult for humanity to forego hydrocarbon energy especially after the severe Fukushima nuclear power plant accident. Last but not least, we need to grapple with the paradox that resource nationalism has blossomed simultaneously with the globalization of energy markets, which makes geopolitical relationships more complex and unstable.

The coming IAEE Asian conference held in Beijing will provide an opportunity where policy issues are presented, considered and discussed at both formal sessions and informal social programs. All conference sessions address critical issues of vital concern and importance to governments and energy industries. For example, given the current world economic situation and the struggling international negotiation on climate change, what is the ideal mix of market competition and world cooperation? Does the current energy supply and transport infrastructure ensure long-term security?

Keynote speakers from the most influential government think-tanks, energy corporate and academic institutions will be invited. Dr. Wumi Iledare, the president of IAEE and distinguished Professor of Petroleum Economics, Policy and Strategic Studies, University of Port Harcourt, Nigeria, and the former professor of Petroleum Economics and Policy Research at Louisiana State University, USA, will give a keynote speech. Other key speakers include:

- Prof. Beng Wah ANG, the editor-in-chief of Energy Economics, from the Energy Study Institute at the National University of Singapore
- Prof. Tomas Käberger, the editor-in-chief of Energy Science and Engineering, from Chalmers University of Technology, Sweden
- Prof. Jiankun He, deputy director of Tsinghua University and the deputy director of National Expert Committee on Climate Change of China

Further, the hosts encourage specific session proposals or submissions that address challenges in translating energy science, management science and economic theories into policy recommendations and injecting policy
wisdom and lessons into scholarly analysis and debate.

Two technical tours will be offered for delegates. One will be arranged right before the conference, the other after the conference. Both deal with sustainable energy projects located in attractive suburbs of Beijing; for example, the wind and solar energy storage and transportation demonstration project.

Supporting the Asian conference in Beijing, The Energy Journal has offered a special issue on Chinese Energy Economics. Selected high-quality papers from the 4th IAEE Asian Conference will be published after peer reviews. The Energy Journal is a SSCI-indexed top journal in the field.

As usual, graduate students are encouraged to participate in the conference. This conference provides a Best Student Paper Program, Registration Scholarships, and OFID-IAEE Support for students from developing countries. See details at: http://iaeeasia.csp.escience.cn/dct/page/70021.

We are accepting paper and abstract submissions from now on. We look forward to a great conference and to welcoming you to Beijing China. For detail please visit http://iaeeasia.csp.escience.cn/

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### IAEE/Affiliate Master Calendar of Events

(Note: All conferences are presented in English unless otherwise noted)

<table>
<thead>
<tr>
<th>Date</th>
<th>Event, Event Title and Language</th>
<th>Location</th>
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<td>USAEE/IAEE</td>
<td>USAEE Headquarters</td>
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World Natural Gas Markets and Trade: A Multi-Modeling Perspective
Edited by Hillard G. Huntington and Eric Smith

This special issue is an important outgrowth of the Stanford University Energy Modeling Forum (EMF) 23 working group. The volume explores nascent modeling efforts to represent international natural gas markets and trade for improving the understanding of key policy and investment decisions. Although formal modeling is not required to describe the growth of liquefied natural gas or the role of spot markets, decision makers can gain powerful insights from these frameworks.

Following the editor’s introductory and overview chapter, the volume includes 12 technical papers by participants in the EMF study. Seven chapters provide unique perspectives on the regional price, volumes and trade estimates from individual modeling frameworks. These systems include competitive models of world natural gas markets as well as strategic models of European markets with market power. The remaining five chapters cover important topics discussed by the working group during the study.

The range of issues is comprehensive and intriguing: trans-Atlantic price convergence, the linking of oil and gas prices through future gas-to-liquid (GTL) capacity additions, the critical role of Middle Eastern natural gas supplies, the extraordinary potential for Russia supplies if key constraints can be overcome, potential collusive behavior by Russian and Middle East exporters, the dynamics of transportation and storage capacity adjustments in response to market power opportunities, European markets reliance upon Russian natural gas exports, the interrelationship between resource constraints and market power, reserve appreciation in known North American fields, and improving insights and decisions through use of quantitative models.

ISSN Number 0195-6574

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* Modeling the Growth in Gas Reserves From Known Fields
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Expanding Access to Modern Energy Services in Transition Countries: the Republic of Georgia

By Norberto Pignatti, Irakli Galdava and Giorgi Kelbakiani*

Assuring access to modern energy services to the population is a crucial step to improve human well-being and stimulate economic and social development. The International Energy Agency (IEA) identifies the lack of access to modern energy services as one of the main obstacles to overcome in order to achieve the UN Millenium Development Goals.

The definition of modern energy services includes both access to electricity and to clean cooking facilities (e.g., fuels and stoves that do not cause air pollution in houses). In its 2011 World Energy Outlook, IEA argued forcefully about the need to find and mobilize the resources required to extend access to modern energy services to the poor around the world.

Transition countries are typically not considered particularly problematic as access to energy services is concerned. However, in transition countries the coverage is sometimes far from complete and substantial efforts are still required to ensure the full coverage.

A clear case is the one of the Republic of Georgia. Most of the infrastructure used for the transmission of electricity and the transportation of gas was seriously damaged (and/or deteriorated substantially) in the years immediately following the separation of the country from the Soviet Union (1991). Despite impressive improvements taking place after the rose revolution (2003), some challenges are still ahead.

Access to Electricity

According to 2012 data from the Statistical Office of Georgia (Geostat), 100% of Georgian households had access to electricity.

However, the Ministry of Energy of Georgia has recently published a list of 36 villages for which this is not true. In the list one can find high mountain villages from Adjara, Racha-lechkhumi & Kvemo Svaneti and from Mtkheta Mtianeti. There are also villages from Kakheti, Shida Kartli, Kvemo Kartli, Samtskhe Javakteti and Imereti.

The Ministry of Energy of Georgia has estimated the total cost of bringing electricity to the villages to be of about 5.5 million USD. This is the cost of the “on-the-grid” solution: villages will be connected to the grid (i.e., new transmission/distribution lines will be built).

The estimated cost of access per household shows a large variation (Table 1): from about 900 USD per household in the village Janjghari (Adjara) to about 86000 USD per household in the village Tkemlovana (Sida Kartli).

The cost of granting access to the grid to households that are not yet connected to it can, therefore, be quite high.

A way to reduce these costs, could be moving (in some cases) from the “on-the-grid” to an “off-the-grid” solution. Renewables can provide interesting “off-the-grid” opportunities. For example, solar energy generation seems especially promising in the Georgian case. The annual radiation of the sun in Georgia is estimated to be good (1250-1800 kWh/m²), particularly in isolated mountain locations. An investigation of the cost of installing sufficient solar generation capacity to cover the needs of an average household (500 watt generating capacity, plus accumulators) has quantified the necessary initial investment at approximately 6000 USD1. While almost four times higher than the lowest cost of connection to the grid, this amount is 14 times lower than the highest one. Considering the energy savings and the expected long life of the investment (20-30 years for the panels and 3-8 years for the accumulators) and the flexibility of this solution – thanks to which fixed costs do not increase significantly even for isolated households – this definitely looks like an interesting alternative that could save the Georgian government substantial resources.

Access to Clean Cooking Facilities

The challenges are substantially larger if we consider the access to clean cooking facilities. Household consumption for heating and cooking purposes is one of the causes of large biomass consumption in Georgia (315 thousand tonnes of

Table 1: Access Cost per Household (USD)

<table>
<thead>
<tr>
<th>Region</th>
<th>Range (lowest-highest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjara</td>
<td>872-1545</td>
</tr>
<tr>
<td>Imereti</td>
<td>16537-22879</td>
</tr>
<tr>
<td>Kakheti</td>
<td>7394-18788</td>
</tr>
<tr>
<td>Kvemo Kartli</td>
<td>2323-7359</td>
</tr>
<tr>
<td>Mtskheta-Mtianeti</td>
<td>2727-21717</td>
</tr>
<tr>
<td>RKLS (?)</td>
<td>7925</td>
</tr>
<tr>
<td>Samtskhe-Javakheti</td>
<td>9764</td>
</tr>
<tr>
<td>Sida Kartli</td>
<td>2121-86364</td>
</tr>
</tbody>
</table>

Source: Ministry of Energy and Natural Resources of Georgia

* Norberto Pignatti (n.pignatti@iset.ge) is assistant professor at the International School of Economics at Tbilisi State University (ISET). Irakli Galdava and Giorgi Kelbakiani are Research Fellows at the ISET Policy Institute. See footnotes at end of text.
oil equivalent in 2011 – more than 10 per cent of Georgia’s total final energy consumption – of which 265 tonnes are used by the residential sector – amounting to 28% of the energy consumption by the residential sector). The high incidence of biomass in the energy consumption of Georgian households is consistent with the fact that less than 50 per cent of them (45.8 per cent in 2012) is connected to the natural gas grid.

The situation (already much better than in the recent past) is expected to improve, thanks to large investments by SOCAR Georgia Gas\(^2\), that reports having already invested about 147 million USD since 2008, building 2,300 km of gas lines and giving access to gas to more than 160 thousand new customers. More investment for the future has recently been announced. The new Georgian Ministry of Energy and Natural Resources has developed a joint plan together with SOCAR Georgia Gas, according to which over 86,000 Georgian families will be provided with gas by the end of 2014. At the end of the process (for which investment of at least 40 million USD are expected according to a very conservative estimate) a total of 150,000 additional users should be connected to the natural gas network.

This, combined with the efforts to ensure full access to electricity at a reasonable price should substantially improve the condition of Georgian citizens, as far as access to modern energy services is concerned.

While the obstacles that Georgia has to overcome to assure full access to modern energy services to its citizens are still substantial, the impressive results achieved in the last decade and the initiatives being undertaken presently seem to suggest that the final goal could be achieved in the not too distant future. The costs of achieving such goal (and the time required in the process) will obviously depend on the capacity of Georgian institutions (and especially of the Georgian Ministry of Energy and Natural Resources) to keep a flexible approach, making full use of all the available options, ranging from direct public intervention to the use of market forces.

Footnotes

1. This estimate is based on the experience of a Georgian firm specialized in the installation of stand-alone solar generation systems in remote areas of the country: [http://www.sun.org.ge/](http://www.sun.org.ge/)

2. SOCAR Georgia Gas is a subsidiary of SOCAR Energy Georgia. SOCAR is the State Oil Company of the Azerbaijani Republic.

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Website of the Ministry of Energy and Natural Resources of Georgia: [http://www.energy.gov.ge](http://www.energy.gov.ge)
Azemnews: [http://www.azernews.az/oil_and_gas/57481.html](http://www.azernews.az/oil_and_gas/57481.html)
The Growing Un-affordability of Energy for Households and the Consequences

By Lynne Chester*

Introduction

One of the proclaimed benefits of electricity sector restructuring was to be lower consumer prices. But households are not paying lower electricity prices and have experienced increases far in excess of general price movements. Some European prices rose by more than 100% between 2000 and 2010. Many Australian households experienced an increase of up to 108% during the period 2007-13. Growing numbers of low-income households are spending a higher proportion of their disposable income on energy bills and are suffering deprivation and social exclusion as a result. The energy-impoverished population has been estimated at 150 million in Europe and growing. There is strong empirical evidence that the phenomenon of energy impoverishment is not isolated or temporary but becoming widespread and embedded. Policy responses have been ineffective and are poorly targeted. This article explores the increasing un-affordability of energy for households and the consequences.

Household Electricity Price Increases Following Sector Restructuring

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>n.c.</td>
<td>79.2</td>
<td>Started in the late 1990s</td>
</tr>
<tr>
<td>Chile</td>
<td>109.8</td>
<td>166.3</td>
<td>Started in 1982; early 1990s price increases matched inflation which fell to 5% or less</td>
</tr>
<tr>
<td>Czech</td>
<td>100.0</td>
<td>133.3</td>
<td>Started 1992; cost-reflective household prices phased in 1995-2002</td>
</tr>
<tr>
<td>France</td>
<td>-32.0</td>
<td>1.3</td>
<td>Started 1999</td>
</tr>
<tr>
<td>Germany</td>
<td>-26.2</td>
<td>16.0</td>
<td>Started 1998</td>
</tr>
<tr>
<td>Hungary</td>
<td>66.7</td>
<td>116.9</td>
<td>Started 1990; cost-reflective household prices introduced in 1995</td>
</tr>
<tr>
<td>Ireland</td>
<td>47.3</td>
<td>99.9</td>
<td>Started 1999; cost-reflective household prices phased in from 2001</td>
</tr>
<tr>
<td>Japan</td>
<td>20.9</td>
<td>8.4</td>
<td>Minor changes from 1995</td>
</tr>
<tr>
<td>Mexico</td>
<td>47.8</td>
<td>30.9</td>
<td>Minor changes; household prices remain heavily subsidised</td>
</tr>
<tr>
<td>Netherlands</td>
<td>12.0</td>
<td>35.0</td>
<td>Started 1998; regulation has capped size of price increases</td>
</tr>
<tr>
<td>New Zealand</td>
<td>9.1</td>
<td>203.3</td>
<td>Started 1987; cross-subsidies eliminated in 1992; new regulation from 2003 led to major price increases</td>
</tr>
<tr>
<td>Norway</td>
<td>-20.5</td>
<td>106.1</td>
<td>Started 1991</td>
</tr>
<tr>
<td>Spain</td>
<td>-38.4</td>
<td>58.3</td>
<td>Started 1997 Price regulation capped nominal price increases below supply cost until 2008</td>
</tr>
<tr>
<td>Sweden</td>
<td>n.a.</td>
<td>87.6</td>
<td>Started 1996</td>
</tr>
<tr>
<td>UK</td>
<td>-9.3</td>
<td>86.0</td>
<td>Started 1990</td>
</tr>
<tr>
<td>US</td>
<td>3.8</td>
<td>41.5</td>
<td>Started in the late 1990</td>
</tr>
</tbody>
</table>

Table 1: Nominal Changes in Household Electricity Prices for Selected Countries, 1990-2010 (%)

For major economies that did not embark on electricity sector liberalisation until the late 1990s, real reductions in household electricity prices occurred between 1990 and 2000, which were reversed after restructuring was implemented (Canada, Ireland, U.S.). Price cap regulation has limited the increases for two ‘late starters’ (Netherlands and Spain). In the cases of France and Germany, energy policy decisions about nuclear power and renewable energy - made prior to sector restructuring - lowered long-term electricity production costs which has maintained real reductions for household electricity prices. Two countries which led sector restructuring in 1990 (Norway, United Kingdom) had real reductions in household prices between 1990 and 2000, due to falling generation fuel prices (hydro and coal). Steep increases since then have eliminated these gains. UK electricity prices declined from 1996 to 2004 due to falling fossil fuel prices but rose in real terms by 44% from 2005 to 2010 (Hills 2011: 104). The largest increases in household electricity prices between 2000 and 2010 have been in countries which started restructuring the earliest (Chile, Czech Republic, Hungary, New Zealand).

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See footnotes at end of text.
National changes, however, can mask underlying variations. For example, U.S. prices show an increase post-restructuring of over 40% between 2000 and 2010. Yet household electricity prices in 12 American States rose, between 1999 and 2007, by more than 50% with the highest increase being 74% (Anderson 2009; Showalter 2008). In those U.S. States which have liberalised their electricity sectors, household electricity prices are at least 10% higher than elsewhere (Marcus 2011).

Similar pricing trends are evident for Australia, the most liberalised electricity sector and hailed by the International Energy Agency as a restructuring role model (IEA 2005). As elsewhere, a rapid escalation in household electricity prices started about a decade after restructuring commenced in the mid-1990s.

During the five years to 2003-04, New South Wales (NSW) regulated household prices showed no real change although there were real increases of 5-11% in all other States and Territories except South Australia where prices stagnated before leaping 24% in real terms in 2003-04 (ESAA 2003). In the six year period to mid-2013, the average increase in NSW regulated household electricity prices was nearly 108%. This compares to more than 80% in Victoria, Queensland and Tasmania, and slightly less than 80% for households living in South Australia, Western Australia and the Northern Territory. Australian Capital Territory households experienced the smallest increase of slightly less than 71% (Table 2).

<table>
<thead>
<tr>
<th>State/Territory</th>
<th>Annual change</th>
<th>Cumulative change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007-08 (%)</td>
<td>2008-09 (%)</td>
</tr>
<tr>
<td>NSW</td>
<td>7.5</td>
<td>7.5</td>
</tr>
<tr>
<td>Victoria</td>
<td>7.3</td>
<td>7.4</td>
</tr>
<tr>
<td>Queensland</td>
<td>11.4</td>
<td>9.1</td>
</tr>
<tr>
<td>South Australia</td>
<td>12.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Western Australia</td>
<td>0.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Tasmania</td>
<td>15.7</td>
<td>3.9</td>
</tr>
<tr>
<td>NT</td>
<td>4.4</td>
<td>3.4</td>
</tr>
<tr>
<td>ACT</td>
<td>16.7</td>
<td>7.1</td>
</tr>
</tbody>
</table>

Source: Chester (2013: 2)

Table 2: Nominal Average Increases in Regulated Australian Household Electricity Prices, 2007-13

The Concept of Household Energy Impoverishment

The overwhelming focus of research into the impact of higher household energy prices has been a phenomenon deemed ‘fuel poverty’ found in the UK, Ireland, Europe, U.S. and more recently, New Zealand (e.g., Boardman 1991; Buzar 2007; Healy 2004; Lloyd 2006). Fuel-poor households are considered to have energy costs which are excessive compared to overall household income (Heffner and Campbell 2011: 6). Boardman’s (1991) pioneering fuel poverty research exposed the causes to be a conjunction of low income, rising energy prices and poor energy efficiency in housing.

The official UK definition maintains that fuel poverty exists if a household needs to spend more than 10 per cent of its income on fuel to achieve an adequate level of warmth, and on all other energy services such as cooking and lighting.3 The rationale for 10 per cent was it represented twice the median energy expenditure which was deemed to be a disproportionate level (Boardman 2010). This definition can encompass households that clearly are not poor (Hills 2012: 6). The UK Fuel Poverty Review recommended a more meaningful measure of households below an income threshold of 60% of median income (after housing costs and adjusted for household size and composition) that have energy costs above a reasonable level.

The European Commission’s Energy Policy (2010) suggests that fuel poverty arises from a household using a broad group of energy sources, whereas energy poverty occurs when a household relies on only two energy sources, electricity and gas. The policy’s proposed definition of energy poverty is a pre-defined threshold share of overall household energy expenditure around twice the relevant national average (EC 2010: 16).

Growing Prevalence

Regardless of the definition, the incidence ... is growing (Heffner and Campbell 2011: 6). The numbers judged energy-poor are most prevalent in countries with restructured electricity sectors. Up to 150 million of the European population and 20% of UK households were estimated to be experiencing energy poverty in 2009 (Bird et al. 2010). Within the UK there are marked regional differences, with an
estimated incidence in Northern Irish households of 44% compared to 19% in England (DECC 2011: 11). As electricity prices dropped between 1996 and 2004, energy-poor English households fell to 1.2 million but rose up to four million by 2009 as electricity prices surged (Hills 2011: 32).

Some 13% (27 million) of EU households spend a considerable share of expenditures on household energy costs compared to national averages (EC 2010:16). Relying primarily on 2005 data, the national estimates range from six to nearly 20%, which would now be higher following more recent electricity price increases. Across the Atlantic, nearly 16 million U.S. households were energy-poor in 2006, and the difference between affordable and actual U.S. household energy bills jumped from US$18.2 billion in 2002 to US$41.2 billion by 2008 (Cohen 2008; Power 2006). In New Zealand, the estimated population living in energy poverty grew from 10-14% in 2006 to 23% in 2008 (O’Sullivan et al. 2011).

Data about the numbers of Australian energy-impoverished low-income households are more limited. Chester and Morris (2011) posit that energy impoverishment is a growing problem due to the high ownership rate of high energy use appliances, particularly for space cooling, and the proportions of income and expenditure spent on energy by low-income households.

Poor households spend higher proportions of income and expenditure on energy (Jamasb and Meier 2010a). In 2009-10, domestic fuel and power accounted for 2.6% of average weekly expenditures for all Australian households with electricity costs accounting for 75%. As household disposable income rises, a steadily declining proportion is spent on domestic energy. The poorest 20% of households in 2009-10 spent 4% of average weekly expenditures on domestic energy costs, double that of the richest households (Table 3).

Table 3 also shows the disproportionate impact of energy costs. In 2009-2010 the poorest income quintile, actually nearly 25% of Australian households, spent, on average, 7% of equivalised disposable income on household energy costs. This is nearly three times the proportion spent by the wealthiest households.

The Impacts and Consequences for Low-income Households

A low-income household’s capacity to meet escalating energy costs will be influenced by housing conditions, tenure and the capacity to change its energy demand. Draughty, poorly insulated, inadequately ventilated and older housing causing damp and mould growth, excess cold or excess heat, will drive energy use for space heating and cooling. Owner-occupiers are more likely to make energy efficiency improvements but may have insufficient financial resources to do so, whereas renters will not generally have the responsibility or right to make housing improvements to reduce energy use. Low-income households have much less capacity to influence housing energy efficiency to reduce their energy demand and stem the growth of energy bills as prices rapidly rise.

The ability of low-income households to adjust their energy demand also will be influenced by the size, composition and daily activities of the household, as well as the capacity to replace energy-inefficient appliances and adopt different household practices. A number of studies have found that the energy demand of low-income households is relatively price insensitive (e.g., Jamasb and Meier 2010b). Consequently, higher electricity prices can be expected to shift low-income household expenditure patterns because greater proportions of disposable income are needed for energy bills and less will be available to meet other essentials.

There is strong international evidence of increasing proportions of disposable income needed to pay ever-increasing electricity bills and of low-income households suffering considerable hardship to pay these bills (e.g., EPEE Project 2009). Strong correlations also have been found, in the UK and Europe, between fuel poverty and winter mortality, housing energy efficiency, self-disconnection, expenditure

<table>
<thead>
<tr>
<th>2009-10</th>
<th>Lowest</th>
<th>Second</th>
<th>Third</th>
<th>Fourth</th>
<th>Highest</th>
<th>All</th>
<th>Second &amp; third deciles</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of total households</td>
<td>24.5</td>
<td>18.2</td>
<td>18.1</td>
<td>18.6</td>
<td>20.6</td>
<td>100</td>
<td>21.3</td>
</tr>
<tr>
<td>Mean weekly income</td>
<td>$314</td>
<td>$524</td>
<td>$721</td>
<td>$975</td>
<td>$1704</td>
<td>$848</td>
<td>$429</td>
</tr>
<tr>
<td>% of av. weekly expenditure on domestic fuel and power</td>
<td>3.9</td>
<td>3.2</td>
<td>2.8</td>
<td>2.4</td>
<td>2.0</td>
<td>2.6</td>
<td>3.7</td>
</tr>
<tr>
<td>% of av. weekly domestic fuel and power expenditure on electricity</td>
<td>76.3</td>
<td>75.0</td>
<td>74.6</td>
<td>75.7</td>
<td>74.3</td>
<td>75.1</td>
<td>n.a.</td>
</tr>
<tr>
<td>% of equivalised disposable income on domestic fuel and power</td>
<td>7.0</td>
<td>5.3</td>
<td>4.3</td>
<td>3.7</td>
<td>2.6</td>
<td>3.8</td>
<td>6.5</td>
</tr>
<tr>
<td>% of equivalised disposable income on electricity</td>
<td>5.4</td>
<td>4.0</td>
<td>3.2</td>
<td>2.8</td>
<td>1.9</td>
<td>2.9</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

Source: Chester (2013: 4)
trade-offs between food and energy, impacts on nutrition, physical and psychological health, as well as social exclusion, marginalisation and relationship breakdown (e.g., Gibbons and Singler 2009; Liddell and Morris 2010; McKendrick et al. 2003). In the U.S., unusually cold weather has led low-income families to reduce their expenditures on food – the ‘heat or eat’ syndrome (Battacharya et al. 2003).

Recent Australian research has found that the well-being, health and lifestyle of low-income Australian households are suffering from the cumulative effects of ever-increasing electricity bills over a period of many years (Chester 2013). Using only one room, shorter (or occasionally, no) showers, watching less television, rarely having friends or extended family at home to avoid using cooking appliances and/or the room temperature being uncomfortable, never or rarely leaving home, going to bed fully clothed (or early) to avoid the use of heating – these are some of the strategies that low-income Australian households are using to manage their energy use as they endeavour to control the size of bills. As a result of cutting expenditures on essentials such as food and reallocating expenditures on other items to pay energy bills, and making relatively severe changes in household practices to reduce energy use, these households are suffering physical discomfort, reduced physical and mental well-being, loneliness and social isolation, strains within household relationships, and distress about the social and emotional well-being of children.

Current Assistance for the Energy Impoverished

Generally not designed to address the specific problem, current policies are skewed towards temporary reactive financial assistance to limit the impact of energy prices or, and to a much lesser extent, provide short-term increases in household income. The dominant policy measures are social tariffs, concessions, rebates, and pre-payment meters supplemented by allowances such as the UK winter fuel payment or the Australian utilities allowance for income support recipients. Improvements to housing energy efficiency, such as insulation and retrofitting, are far more limited.

The majority of policy measures are so tightly targeted that they do not capture all those experiencing energy poverty (Chester and Morris 2011). Moreover, these measures are reactive, fragmented and do not provide widespread, long-term improvements to housing energy efficiency, a critical driver of energy use. Policy measures to improve energy efficiency and increase accessibility by low-income households, are relatively limited in scale compared to energy bill assistance and a focus on changing household behavioural practices rather than housing conditions to reduce energy use. Overall, current policy measures assisting low-income households do not ameliorate or eliminate the energy hardship experienced.

Footnotes

1 Further steep increases are expected with the adoption of carbon pricing policies adopted given electricity generation’s high reliance on fossil fuels which contributes more than 40 per cent to global carbon emissions.

2 Most Australian households can choose the company to supply their electricity. For those who have not chosen a ‘market contract’, their electricity prices are set by State and Territory government regulators. The prices paid by households under a market contract are not available. The changes in regulated prices, however, are a strong indicator of the experience of all Australian households.

3 World Health Organisation standards are used to define ‘adequate’ level of warmth. These are: 21 degrees Celsius in the main living room and 18 degrees Celsius in other occupied rooms during the day and lower temperatures at night.

4 These figures understate the current situation because they do not include the effect of the substantial Australian electricity price increases since mid-2010 (Table 1).

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Methane Hydrates
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Reducing Energy Poverty in Africa: Barriers and the Way Forward

By Joseph Ayoola Omololaibi*

Introduction

Energy poverty can be defined as the lack of adequate modern energy for the basic needs of cooking, warmth, lighting, and essential energy services for manufacturing, services, schools, health centres and income generation.

The governments and people of rich industrialised countries are currently preoccupied by what many perceive to be an energy crisis. Rising global oil prices, concerns over energy security, and the urgent need to address climate change, are putting energy at the centre of public policy. But another energy crisis is affecting the lives of millions of people in African countries, and it is largely being ignored.

The crisis associated with energy poverty condemns millions of men, women and children in Africa to continue to live in absolute poverty because they have no access to modern energy services; energy which is taken for granted in the developed world at the flick of a switch or the press of a button.

According to the International Energy Agency (IEA, 2012), Over 1.6 billion people – almost one third of humanity – have no electricity, the majority of which are in Africa. This means they have no light in the evening, limited access to radio and modern communications, inadequate education and health facilities, and not enough power for their work, activities and businesses.

The international community recognises a number of basic rights: the right to water, the right to food, the right to health, the right to adequate housing, the right to gain a living by work and the right to take part in cultural life. Missing from this list is the right to energy. Yet, everyone needs energy to cook food, to heat the home, to earn a living, to benefit from good health and education services. Energy poverty denies people in Africa a basic standard of living which should be available for all.

Only 15% of the population in Africa has electricity, and one quarter of the 2.5 billion people cooking with biomass live in Africa (IEA, 2012). Achievement of all of the Millennium Development Goals (MDGs) has been limited by energy poverty in Africa and across the developing world. This lack of access to efficient modern energy has a significant impact on economic development and small-scale enterprise, educational opportunities, infant mortality, drudgery for women and quality of life.

Barriers

Large scale infrastructure geared towards export of energy to industrialised countries. The current dominant development model is focused on achieving macro-economic growth. This results in a predominance of attention to investment in large-scale energy infrastructure to provide energy for growth (i.e., large scale coal, large hydro, transmission grid, and pipelines). Much of the infrastructure for energy in African countries is for the export of energy to industrialised countries or urban centres, not for local use. There is a need to redress the balance, with much more attention and investment directed towards the supply of local energy services for poverty reduction in local communities. National development strategies will need local energy delivery (local grid, fuel distribution, renewable energies, etc.) alongside large-scale infrastructure development.

Funding gap. In Africa, the energy needs of the poor are small, but small amounts of energy can make a significant difference to their lives. However, the great majority of people without adequate access to energy live on less than US$2 per day, making it difficult for them to access good services, including access to modern energy services. Energy access is not without cost and the initial expenditure on connections (electricity) or better technologies can be high.

Lack of sustainable models. Existing policy frameworks and national energy policies in African countries often do not respond to the needs and capacities of the poor. Similarly, energy technology research, development and transfer do not respond to the energy needs and capacities of the poor. The sustainability of energy access for the poor has always been one of the greatest concerns: that is, the continuous supply of reliable energy services, long after the original energy access programme has ended. Poor sustainability of decentralised energy systems has created mistrust in them from planners, policy and decision-makers, hindering the wider uptake of options that could provide energy access for the poor. In urban areas, it is frequently the case that after just a few months of connection to electricity, poor people stop using it. Despite the regular supply of kerosene, natural gas and LPG, people continue to use wood or biomass residues or charcoal. In rural areas, small energy generation systems, installed
to provide electricity to small villages or communities, frequently last a few months before being abandoned. Similarly, large numbers of projects for the dissemination of efficient stoves have not changed the use of three stones from being a common practice. Such situations have been understood as ‘unsustainable energy access for the poor’, and are caused by the original programme not addressing the underlying problems associated with poverty and household cash flow, lack of technical capacity and institutional support.

Climate change agenda by-passes the poor: The rate at which millions of Africans are struggling with energy poverty, access to clean, and affordable energy services is a higher priority than climate change. There has been a tendency to exclude some energy mixes and technology options on the basis of carbon emissions and their impact on climate change, promoted mainly by those who are unaware that providing access to energy for the poor would entail a low level of emissions. In the worst case scenario for energy supply – using fossil fuels for 100% of electrification and 100% of cooking for the poor – the total increase in emissions would be as little as 2% of present world emissions. Therefore, African countries and developing economies as well should have an allowance to provide energy access for the poor, and that allowance should be divided within each country according to the energy needs of the poor, excluding other energy needs such as transport, commerce, industry, and mining.

The Way Forward

Recognising the right to energy: Despite the common acceptance by multilateral, bilateral agencies, governments, academia and civil society that energy is critical for development, energy is not a high priority issue in policy debate. There are no specific objectives or targets within the MDGs on energy access. Therefore, modern energy, being a critical issue for human development, should be considered a basic right, and should be provided on the basis of justice for the poor.

Political willingness from governments: There is sufficient evidence that important changes will only be possible with political willingness at the highest level. The market approach is not the right one for energy access for the poor in Africa - governments have to consider it as one of their ultimate responsibilities.

The funding gap on energy access for the poor: In Africa, it is clear that there is a huge funding gap, especially for initial investments, which could not be paid by the poor. Comparing this with the huge investment on energy security, reducing energy poverty represents only 2.85% of the total investment required on energy security by 2030 (IEA, 2012); however compared with the real money currently available for energy access this amount is large. New funding mechanisms and sources need to be found.

Clear and specific pro-poor policies and strategies: The experience of the last three decades shows that neither global nor country strategies have been clear enough to tackle energy poverty. New pro-poor strategies for energy access, linked to the delivery of the MDGs, need to be implemented rapidly especially in Africa and other developing countries.

Sustainability of energy access: To achieve sustainable delivery of energy to the poor in Africa, the following main activities should be promoted widely and vigorously: (i) The creation of local capacities (national and local) is the most effective way to ensure affordability, accessibility and sustainability; (ii) Mobilisation of local capital can contribute to energy access for the poor; and (iii) Energy literacy can contribute to the sustainability of the systems and improve relations between provider and user of energy.

Allowance of greenhouse gas emissions to provide energy access for the poor: Energy for the poor should use all of the energy mix available, assessed on the basis of sustainability, cost and availability rather than on contribution to climate change.

Alternative climate change mechanisms: The most important existing financing mechanisms such as the Clean Development Mechanism (CDM), the GEF and the climate change funds of the World Bank, should be regularly assessed against their real impact in addressing energy poverty and ensuring access to energy for the poor in developing nations. A new mechanism should be developed which can transfer increasing amounts of the growing carbon market funds towards projects which directly reduce energy poverty both globally and regionally.
Energy Investments in Africa by the U.S., Europe and China

By Giorgio Gualberti, Morgan Bazilian and Todd Moss*

Introduction

The energy sector in sub-Saharan Africa (SSA) is developing rapidly, and has become a priority area for both SSA governments and international partners. The World Bank estimates that meeting SSA’s power needs will require an annual investment of 4 percent of the region’s gross domestic product or around USD 50 billion (Rosnes and Vennemo, 2009). We briefly explore the comparative funding for energy from the United States, China, and the European Union in order to better understand the complex political and funding landscape around public and private investment in promoting access to energy services.

As a high-profile example of recent activity, the newly elected Chinese President Xi Jinping made a visit to South Africa, Tanzania, and the Republic of Congo in his first international trip, just one week after taking office. On the occasion, the Chinese President promised more than USD 20 billion in loans for infrastructure, farming and business, with a majority of this financing understood to be heading to the energy sector (Buckley, 2013) (Stoddard, 2013).

The European Union and its member states are likewise deeply engaged in the sector. Since 2002, the European Commission has established several energy initiatives, facilities and funds, complementing the bilateral assistance of EU member countries. In addition, the EU was an early supporter of the UN Sustainable Energy for All Initiative, and made a pledge to assist developing countries in providing energy access for 500 million people by 2030 (EC, 2012).

Several months after the Chinese mission to SSA, U.S. President Barack Obama visited South Africa, Tanzania, and Senegal where he unveiled “Power Africa.” This White House-led initiative is a largely private sector focused effort to support the SSA energy sector, with the objective of adding up to 10 GW of generation capacity, access to at least 20 million new households, and with a headline figure of USD 7 billion in financial support over five years.¹

The U.S. plan is characterized by a strong market based approach and a substantial involvement of the private sector, but also leverages public agencies, such as the U.S. Export-Import Bank (ExIm), the Overseas Private Investment Corporation (OPIC), and grant-making agencies such as USAID. The vast bulk of the public sector financial investment will be in the form of export credits and risk insurance for U.S. companies via ExIm and OPIC. The strong emphasis on supporting investment by U.S. firms is not surprising, however, given the scale of the required investments and the perception by some American companies that they face an historical disadvantage with respect to Chinese and European firms that already have strong footholds and relationships in place. While some commentators interpreted Obama’s visit and the Power Africa initiative as a belated countermove to growing Chinese influence, the focus on Africa’s substantial energy gap was widely welcomed on the continent.²

Financial Flows and Politics

There is a broad view that China has invested heavily, both financially and politically, in Africa in the latest decades, and its influence has risen accordingly. As an example, China has promoted the Forum on China-Africa Cooperation that met regularly every three years and emerged as a leading showcase for Sino-African relationships. Additionally, the China Africa Development Fund exists as an important vehicle for Chinese investments in the continent. Merchanisde trade between China and Africa also increased dramatically, and China has surpassed the United States in becoming the second largest trade partner after the EU.

This growing Chinese role has naturally encountered elements of resistance, skepticism and accusations of exploitation of natural resources, mining and fossil fuels (Okeowo, 2013). While China is interested in accessing African resources, it would be a misjudgment to reduce its involvement to that sole element, or thinking that Western counterparts have dramatically different economic interests (Kolstad & Wiig, 2011). As an example, fossil fuels are the main SSA export, but between 2011 and 2012 fossil fuels exports to the U.S. and China were similar in value-Gand, combined, still less what was exported to the EU. However, both exports towards the U.S. and China are greatly concentrated in few fossil and minerals

¹ Giorgio Gualberti, Morgan Bazilian and Todd Moss are with the University of Lisbon, Portugal, Columbia University, New York, USA and the Center for Global Development, Washington DC, USA, respectively. Giorgio Gualberti may be reached at giorgio.gualberti@gmail.com
See footnotes at end of text.
product groups, while SSA exports to the EU are more diversified (Table 1).

Bräutigam (2009)(2010) affirms that Beijing’s current push in Africa is part of a long-term strategy, still unfolding, but should not be reduced to a hasty “scramble” for resources. In the 1960s, China supported several anti-colonial liberation movements and then after independence remained closely allied. Chinese companies, with Chinese government support, built railroads and stadiums and then started to win construction contracts. By the 1980s Chinese state-owned companies had begun to invest more heavily on the African continent, a trend that has accelerated in the past decade. While early economic engagement was largely ideological, commercial interests have grown more prominent over time. While natural resources as inputs to Chinese domestic growth are a key driver, Chinese firms now view Africa more broadly as a positive business opportunity, characterized by lower competition than their domestic market and even as a potential export market. The principal Chinese exports into Africa are machinery and electric and electronic equipment. Chinese investments are thus diversifying into many sectors, including energy, financial, telecommunications, and transport.

Foreign aid, or concessional finance, is an important part of Chinese involvement in Africa, but quantitative analysis is difficult because of data paucity. While all members of the OECD report annually on their official development assistance (ODA), China does not participate. However, Cannan et al. (2013) affirm that while Chinese ODA is likely relatively low (estimated at around USD 2 Billion in 2010), China tends to make larger use of Other Official Flows (such as export credits, natural resourced backed lines of credit, and mixed instruments) that reached approximately USD 5-6 Billion (in 2007). Foster et. al. (2009) estimated that commitments of finance for infrastructure to be USD 7 Billion in 2006 (the Chinese “year of Africa”) and USD 4.5 Billion in 2007. Bräutigam (2011) estimates that disbursements of aid (ODA only) in 2008 to be 1.2 USD Billion. Recently AidData has unveiled a project to track Chinese Development Finance to Africa through the analysis of media reports (Strange et al. 2013). Following this approach the estimates for 2008 commitments are of more than 12 USD Billion, including both ODA and Other Official Flows. These discrepancies have generated much debate and hopefully will lead to an improvement of quantitative data in the future (AidData, 2013) (Bräutigam, 2013a).

Chinese development finance also has some particular characteristics: the first is that it is almost totally focused on Sub-Saharan Africa, contrary to European and U. S. development finance that largely

<table>
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<tr>
<th>Product Code</th>
<th>Product label</th>
<th>SSA to China</th>
<th>SSA to EU27</th>
<th>SSA to U.S.</th>
<th>SSA to World</th>
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<td>All products</td>
<td></td>
<td></td>
<td></td>
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<td>67</td>
<td>74</td>
<td>134</td>
<td>174</td>
<td>69</td>
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<tr>
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<td>Mineral fuels, oils, distillation products, etc (shares)</td>
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<td>53</td>
<td>6</td>
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<td>72%</td>
<td>49%</td>
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<tr>
<td>HS 71</td>
<td>Pearls, precious stones, metals, coins, etc (shares)</td>
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<td>0</td>
<td>9</td>
<td>9</td>
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<td>1%</td>
<td>1%</td>
<td>7%</td>
<td>5%</td>
<td>4%</td>
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</tr>
<tr>
<td>HS 26</td>
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<tr>
<td>17%</td>
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<td>2%</td>
</tr>
<tr>
<td>Everything Else (shares)</td>
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<td>40</td>
<td>32</td>
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<td>15%</td>
<td>18%</td>
<td>30%</td>
<td>43%</td>
<td>16%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Table 1: SSA Exports by Partner and Product Group - USD billion and shares. Source: (International Trade Center, 2013)
flows to North Africa (41% and 30%, respectively). The second is that it is concentrated on few, high-budget, hydroelectric projects, with the largest five representing together 50% of the total commitments, and the total share surpassing 60% (Table 2) ³.

The third, and perhaps most interesting, characteristic is that an analysis of the distribution of development finance by country reveals that China is particularly strong in countries with little or no involvement from the EU and the U.S. (Figure 1).

Foreign direct investment data is another way to assess the trends. Unfortunately, these are also scant: granular statistics of FDI per sector and country are not publicly available either for China or OECD countries, and analysis is only possible with data collected by third-part organizations or researchers. For the energy sector, the World Bank maintains a database of Private Participation in Infrastructure projects (PPI), reporting greenfield or portfolio investments (World Bank, 2013a) with limited coverage of Chinese investments, while the Heritage Foundation (HF) has built a dataset of Chinese investments worldwide by sector, often cited as the main source for quantitative data ⁴.

Chinese official FDI figures also have some accuracy issues, because many corporations channel their foreign direct investments through offshore centers and thus two of the three largest recipients of Chinese FDI appear to be the Cayman and the British Virgin Islands (the first is Hong Kong), likely concealing the final investment destination (MOFCOM, 2011) (Bräutigam, 2013b).

Taking into account all these differences, we note that the figures provided by HF for the investments in Africa (all sectors) is of 29 USD billion (2005-2012), significantly higher than the Chinese official figures of 11 USD billion (see appendix). Considering only the investments in the electricity sector in SSA, and combining WB and HF data (while doing our best to avoid duplication) we obtained a total figure for 2005-2012 of 2.4 USD billion from the EU, 1.4 USD billion from the U.S., and 1.2 USD billion from China. A chart of the energy FDI by destination country from the EU, U.S. and China is provided in Figure 2. According to the data, with few exceptions (like Kenya), there is nearly always a clear dominant player in the energy investments of a specific African country. Also interestingly, of the six countries selected initially for the Power Africa initiative (Ethiopia, Ghana, Kenya, Liberia, Nigeria, and Tanzania),

<table>
<thead>
<tr>
<th>US</th>
<th>EU</th>
<th>China</th>
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<tr>
<td>30%</td>
<td>21%</td>
<td>Energy Policy and Admin. Management</td>
</tr>
<tr>
<td>2%</td>
<td>21%</td>
<td>Renewable Energies</td>
</tr>
<tr>
<td>2%</td>
<td>13%</td>
<td>Non-Renewable Energies</td>
</tr>
<tr>
<td>13%</td>
<td>13%</td>
<td>Hydroelectricity</td>
</tr>
<tr>
<td>47%</td>
<td>31%</td>
<td>Electrical Transmission</td>
</tr>
<tr>
<td>8%</td>
<td>1%</td>
<td>Other</td>
</tr>
<tr>
<td>5%</td>
<td></td>
<td>Rural Electrification</td>
</tr>
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</table>

Table 2 - Sectoral Shares of Development Finance for the Energy Sector of SSA, USD Millions, total 2000-2012 (2009 constant prices). Source: elaboration on AidData.org

Figure 1: Development Finance for the Energy Sector of African Countries from US, EU and China 2000-2012 USD Millions. Source AidData.org

Figure 2: Investments for the electricity sector from US, EU and China to African Countries, 2005-2012, USD millions. Source World Bank PPI and Heritage Foundation.
the United States is the dominant player in only one (Tanzania).

These FDI figures do not include the value of contracts that are awarded by national governments through competitive bids, though these instruments constitute another major occasion of economic involvement in the energy sector of African countries. The Heritage Foundation estimates that the value of contracts awarded to Chinese companies for the energy sector to be of more than 18 USD Billion for the period 2005-2012, and notably these contracts are all in the hydroelectricity sector, showing a clear correspondence with the distribution of Chinese aid (Figure 3).

The relationship between Chinese Trade, FDI and Development Finance has been the object of intense academic and policy debate that highlighted some peculiar aspects: the first is that Chinese aid has tied characteristics, is often strategically integrated with trade and tends to precede FDI. The second is that the ownership of Chinese firms influences the FDI location choice and the risk aversion, with State Owned Enterprises generally more interested in larger, longer-term projects, often in natural resources, and less averse to political and economic risks, while privately-owned enterprises are more market seekers and tend to expand in richer and more stable countries. (Kaplinsky & Morris, 2009) (Sanfilippo, 2010) (Ramasamy et. al, 2012).

Conclusion

Despite shortcomings in the data, international financial involvement in the sub-Saharan African energy sector, in all its various forms, appear to be growing. After a substantial period of relative weak interest from international companies, this is a welcome trend. If SSA hopes to come close to meeting universal energy access goals by 2030, the continent will require a broad range of investors, well above the scale experienced to date. We have attempted to explore some trends for energy sector investments by three large donor and investor countries. Based on our preliminary analysis, it appears that there is less competition between these countries in many markets than had been assumed. Still, the scale of total investment remains far below the estimates of current and future demand. In other words, there remains plenty of space for all investors. Caution therefore may be warranted before drawing conclusions about the machinations of policymakers in Beijing, Brussels, and Washington. Similarly, policymakers may be driven more by commercial or development objectives than strategic counter-moves. The principal challenge for African policymakers will be to manage these giant players in a manner that maximizes the flows—and ultimately boosts the generation and distribution of energy to reach the millions currently living without.

Footnotes

1 www.whitehouse.gov/the-press-office/2013/06/.../fact-sheet-power-africa

2 See for example: (England, 2013) (Luce, 2013) (Stover, 2013) (Stoddard, 2013). Of course, China and the U.S. have a history of cooperation in the energy field, a least at the diplomatic level – see e.g., http://www.whitehouse.gov/the-press-office/us-china-clean-energy-announcements

3 The purpose of Energy Policy and Administrative Management may include also multi-sectorial projects that include physical infrastructures.

4 These datasets differ from official FDI statistics in various ways, including: 1) both databases record the advertised financial commitment rather than the yearly financial flow (FDI flows can occasionally be negative), 2) HF includes only projects above the threshold of 100 USD Millions while for the WB-PPI the threshold is 1 USD Million and a minimum 25% of shares of the project owned by a foreign private company and, 3) the WB-PPI figures are limited to infrastructures in the energy, water, transport and telecommunication sectors (World Bank, 2013b) (The Heritage Foundation, 2013).
References


14th IAEE European Energy Conference
Sustainable Energy Policy and Strategies for Europe
Rome, 28-31 October, 2014

The AIEE - Italian Association of Energy Economists will organize in Rome the 14th IAEE European Energy Conference together with the IAEE - International Association for Energy Economics in cooperation with the LUISS University of Rome.

The 14th IAEE European Energy Conference will try to discuss all matters related to the European policy and its new perspectives, analyzing the events and changes that characterize the international energy context and the possible developments in the coming years.

8 plenary sessions and 50 parallel sessions to discuss about:

- Extending the scope of European energy regulation
- Are we meeting the targets of RES cost reduction?
- The SET-Plan: is it working?
- Progress on the Road-Map to 2050
- Energy storage – effects on the market
- Changes in the geo-political situation
- Smart grids, smart meters, smart cities
- Effects of unbundling in the gas sector
- Promoting or imposing energy efficiency?
- Non-conventional hydrocarbons in Europe
- Virtual power plants
- Sectorial approach to energy efficiency in industry
- The challenge of energy for transportation
- Bioenergy and agriculture
- Nuclear energy: back to the future?
- NIMBY for RES
- Formation of prices in gas and electricity markets
- North-South cooperation on renewable energy
- Local activities and the Covenant of Mayors
- Access to energy
- CCS: opportunity in different countries
- Climate policy and emission trading
- Energy poverty in developed countries
- Energy supply and security
- Market instruments for energy efficiency
- Reflections on energy price market
- Sustainable communities and citizen-led activities
- Sustainable development and economical growth
- Technology development
- The future energy demand
- The perspective of LNG
- Towards a low-carbon economy
- Wind and solar energy

For detailed information regarding the abstract submission, conference programme, organization and student support, we invite you to visit the conference website:

www.iaee2014europe.it

Abstract submission starts January 1st, 2014 - deadline: May 15, 2014

The concurrent sessions will be organized from accepted abstracts. Authors may be encouraged by the Programme Committee to organize specific sessions. Submitted abstracts should be of one or two pages in length, comprising (1) overview, (2) methods, (3) results and (4) conclusions.

We welcome you in Rome!

Contact the Conference Secretariat:
Tel: +39-06-3227367; +39-06-32652279; Fax: +39-06-3234921 - Email: assaiee@aiee.it; info@iaee2014europe.it

REGISTRATION FEES

<table>
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<tr>
<th>Participants</th>
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<td>€ 575</td>
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<td>Speaker/Chair Non-Member</td>
<td>€ 600</td>
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<td>Accompanying person</td>
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CONFERENCE VENUE

The **LUISS independent university** is placed in one of the city’s most beautiful areas close to Rome’s historic centre. The conference rooms are modern and provided with all the technical devices. The Venue’s facilities include also a space for the Information and Registration Desk where the participants will have at their disposal throughout the conference computers with Internet access, free wireless connection and a catering area for the coffee breaks and lunches.

THE GALA DINNER

On **Wednesday, October 29, 2014** a gala dinner will be offered to the participants at the **Caffarelli Terrace**, a magnificent terrace with a view to the Piazza del Campidoglio designed by Michelangelo and with the equestrian statue of Marcus Aurelio in its center.

THE CONFERENCE DINNER

On **Thursday, October 30 2014** a conference dinner will be offered to the participants in the charming and elegant **Hall of Columns of the LUISS University**.

### THE CONFERENCE PROGRAMME

<table>
<thead>
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<tr>
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<td>10.00 – 17.00</td>
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<tr>
<td>IAEE European Affiliate leadership meeting</td>
<td>Breakfast Meetings</td>
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<td>09.00 – 10.30</td>
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<td>20.30 – 22.00</td>
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<td>Students Happy Hour</td>
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<td>20.30 – 22.00</td>
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<tr>
<td>Breakfast Meetings</td>
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<tr>
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<td>Coffee Break</td>
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<td>16.00 – 17.30</td>
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STUDENTS

Students are especially encouraged to participate and may attend the conference at the reduced student registration rate.

In addition students may submit a paper for consideration in the IAEE Best Paper award Competition (cash prizes plus waiver of conference registration fee). Students are also welcome to participate in the Student Poster Session.

[visit: http://www.iaee2014europe.it/pages/student_events.html; http://www.iaee2014europe.it/pages/student_awards.html]

REGISTRATION AND HOTEL ACCOMMODATION INFORMATION - Agreements were made for special rates/night (from 80 to 150 Euro) in various hotels, close to the conference venue. Early bird registrations are highly recommended.
The AIEE – Italian Association of Energy Economists – and the IAEE – International Association for Energy Economics – are organising the 14th European IAEE Conference to be held in Rome, Italy from October 28 to 31, in collaboration with, and on the premises of, the LUISS University. It may be noted that this will be the third European Conference of IAEE to be held in Italy in recent years (after Florence in 2007 and Venice in 2012). There are at least three reasons for this concentration: first, AIEE is one of the largest affiliates of IAEE (arguably the largest in Europe); secondly, the Italian art cities can be counted upon as powerful attractors for visitors sensible to art and history and not only to energy economics; thirdly, the hospitality in terms of tourist facilities and conference organisation is ample and well tested.

The title of the Conference, “Sustainable Energy Policies and Strategies for Europe”, stresses the importance of the redefinition of an energy long-term view for the European Union at a critical moment for the re-launching of the Union against an increasing background of scepticism and local interests. Voices are heard in favour of making energy a unifying issue for Europe, much as the origins of the European Union can be traced to collaborations in the energy field, through Euratom for nuclear and the European Steel and Coal Community (ECSC) for coal. This time at which Europe is hopefully emerging from the tunnel of the economic crisis may well be appropriate for such an initiative.

However, European IAEE Conferences have now acquired a tradition of not limiting their focus to European issues. In recent years, the participation from non-European countries was large and well qualified and dealt with subjects certainly not limited to Europe; energy is increasingly an international issue, and the presence of participants in particular from emerging countries is essential in presenting a balanced view on the subject.

Apart from the opening and closing plenary sessions, that should essentially convey a few basic messages and identify feedbacks from the discussions in the Conference, there will be three sets of dual plenary sessions, constructed about invited key-note papers. They will cover the main country or aggregate strategies for the long term (such as the EU Roadmap to 2050); energy-related environmental challenges beyond the threats to global climate stability; new trends and emerging solutions to energy issues in transportation (a sector which lags behind in energy savings); new trends in energy market regulation and liberalization (including but not limited to the building sector); changes in energy geopolitics and role of the emerging countries.

A number of concurrent sessions (40 according to the present estimate) will cover a wide variety of subjects, to be specified by the aggregation of the papers that emerge from the peer-review process. Some of these sessions (“special sessions”) will be organised directly by the participants. Subjects addressed will cover an extensive range that can hardly be specified in advance.

A particular attention is also dedicated to the stu-
Vents’ participation. The “Students PhD Day”, the “Students Poster Session” and other student activities will offer the PhD candidates the opportunity for presenting an in-depth version of their work in the field of energy economics stimulating the communication among PhD candidates and the exchange between junior and senior scientists. The best student papers presented will be awarded during a special ceremony and the winners will receive a cash prize and a waiver of registration.

The social events, the Welcome cocktail, the Gala dinner and the Conference dinner, will be an opportunity for interaction and discussion in a relaxed atmosphere, organized in two charming elegant places: the “Hall of Columns” of the LUISS University and the “Caffarelli Terrace” - a magnificent terrace located on the Capitol Hill, with a view to, Piazza del Campidoglio designed by Michelangelo.

The 14th IAEE European conference is a special appointment to discuss a whole range of up-to-date energy issues in one of the most beautiful and artistic cities in the world, Rome caput mundi, the cradle of civilization.

Do not miss it!

Information contact: Conference Secretariat: info@iaee2014europe.it; Phone: +39.06.3227367 - http://www.iaee2014europe.it;

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<tr>
<td>Ankoo Patel</td>
<td>Carnegie Mellon University</td>
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<td>Marek Pawlowski</td>
<td>Lodz University of Technology</td>
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<td>Jerrod Penn</td>
<td>University of Kentucky</td>
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<td>Joerg Peters</td>
<td>Rheinisch-Westfälisches Institut</td>
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<td>Marie Petitet</td>
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<td>Mai Phan</td>
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<td>Angela Picciariello</td>
<td>University of Vermont</td>
<td>USA</td>
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<td>Jaqeyn Pless</td>
<td>Colorado School of Mines</td>
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<td>Germain Poot</td>
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<td>Joana Portugal-Pereira</td>
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<td>Vladimir Potashnikov</td>
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<td>Antan Prakash</td>
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<td>Olga Pushkash</td>
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<td>Imperial College London</td>
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<td>Xiao Qin</td>
<td>Shanghai Jiao Tong University</td>
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<td>Daniel Radov</td>
<td>NERA</td>
<td>UNITED KINGDOM</td>
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<tr>
<td>Irina Radzikhovskaya</td>
<td>SWITZERLAND</td>
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| Virginijus Radzikunky 

Lithuanian Energy Institute | LITHUANIA |
| Neringa Radzikunkien 

Lithuanian Energy Institute | LITHUANIA |
| Volker Raffel | GER 

GERMANY |
| Tijani Raffu Vinka | Lagos State Ministry | NIGERIA |
| Alessandro Rainaldi | Universita Roma Tre | ITALY |
| Dominique Rajzaun | FRANCE |
| Carmen Ramos Carvajal | Universidad de Oviedo | SPAIN |
| Kenneth Reddis | Univ of NC at Chapel Hill | USA |
| Ryan Reiber | Carleton University | CANADA |
| Pierluigi Renzi | Universita Roma Tre | ITALY |
| Ernesto Revello | Ctr for Energy Petrol and Min | ITALY |
| Mat Kar 

University of Twente | NETHERLANDS |
| Benjamin Sacher | USA |
| Hamed Sahebnoor | Ferdowski University of Mashhad | IRAN |
| Farukh Said | Nigerian National Petroleum Corp | NIGERIA |
| Ayman Salah Abou El Jenein | FRANCE |
| Darine Salam | American University of Beirut | LEBANON |
| Juan Jose Sanchez Dominguez | KPMG | SPAIN |
| Diego Sandoval | ETH Zurich | SWITZERLAND |
| Jaime SanJuanBenito Bonal | Generandir | SPAIN |
| Edi Saputra | Wood Mackenzie - Asia Pacific | SINGAPORE |
| Mitchell Schwartz | Brandeis University | USA |
| Claudia Schir crippling | GERMANY |
| Avik Sinha | Indian Inst of Mgt Indore | INDIA |
| Yusuf Sire | Enerjisa | TURKEY |
| Rayan Slim | Notre Dame University | LEBANON |
| Robin Smale | Vivid Economics Ltd | UNITED KINGDOM |
| Olubukola Sogbou | Redeemers University | NIGERIA |
| Jin Hui Suh | Imperial College London | UNITED KINGDOM |
New Members continued

Patrick Taylor  
RISC UK  
UNITED KINGDOM

Emeka Uguwuoke  
Petroleum Training Institute  
NIGERIA

Thais Vilela  
PUC - Rio de Janeiro  
BRAZIL

Joel Spaes  
Enerpresse  
FRANCE

Samuel Ifeanyi Ukwuaba  
Petroleum Training Inst  
NIGERIA

Manuel Villavencio  
Universite Paris Dauphine  
FRANCE

Issam Srour  
American University of Beirut  
LEBANON

Onyema Juliet Umeagu  
CPEEL  
NIGERIA

Isabelle Vincent  
ADEME  
FRANCE

Ebba Elisabeth Stahl  
University of Copenhagen  
DENMARK

Jamila Umoru  
NCC Zonal Office  
NIGERIA

Carsten Viuff  
Midflyns Eftonsyns  
DENMARK

Cornelia Staub  
UZH  
SWITZERLAND

Garrett Upstill  
UNSW Canberra  
AUSTRALIA

Alexander von Selasinsky  
GERMANY

Steven Stoft  
USA

Takafumi Usui  
SEVEN Energy  
JAPAN

Subash Subramanian  
University of Calgary  
CANADA

Cyril Vuillecard  
RTE  
FRANCE

Mahmud Suleimon  
University of Abuja  
NIGERIA

Tomas Vorisek  
SEVEN Energy  
CZECH REPUBLIC

Xiaoqi Sun  
China University of Geosciences  
CHINA

Emily Udal  
USA

Elizabeth Warren  
University of Greenwich  
UNITED KINGDOM

Prince Destiny Ugo  
Cape Peninsula Univ of Technology  
SOUTH AFRICA

Nadejda Victor  
Bouz Allen Hamilton  
USA

Dennis Wei  
University of Maryland - AREC  
USA

Issam Srour  
American University of Beirut  
LEBANON

Martin Andreas Vik  
NVE  
NORWAY

Mohamed Wibron  
Mount St. Vincent University  
CANADA

Kingsley William  
Emerald Energy Inst  
NIGERIA

Brian Wiss  
University of Minnesota  
USA

Patrick Taylor  
RISC UK  
UNITED KINGDOM

Di Yin  
Nanyang Technological University  
CHINA

Kamila Vavrova  
VUKOZ  
CZECH REPUBLIC

Arthur Yip  
MIT  
USA

Elisa Trujillo-Baute  
University of Barcelona  
SPAIN

Senol Yildiz  
Istac As  
TURKEY

Christophe Trzpiti  
EDF  
FRANCE

Tomas Vorisek  
SEVEN Energy  
CZECH REPUBLIC

Emily Udal  
USA

Claire Weiller  
Institute for Manufacturing  
UNITED KINGDOM

Ibrahim Tajudeen  
University of Manchester  
UNITED KINGDOM

Jeremy Weber  
USDA Economic Research Service  
USA

Christine Tan  
National University of Singapore  
SINGAPORE

Xu Tang  
China University of Petroleum  
CHINA

Caroline Tandberg  
Thomson Reuters  
NORWAY

Daniel Werner  
University of Maryland - AREC  
USA

Oladipupo Zainab  
Afe Babalola Univ  
NIGERIA

Alexander von Selasinsky  
GERMANY

Nadejda Victor  
Bouz Allen Hamilton  
USA

Christian Zeyer  
SwissCleanTech  
SWITZERLAND

Robert Wimmer  
Toyota Motor North America Inc  
USA

Katherine Vickers  
American University  
UNITED STATES

Di Yin  
Nanyang Technological University  
CHINA

Yulia Woodruff  
McKinsey and Company  
UNITED KINGDOM

Nadejda Victor  
Bouz Allen Hamilton  
USA

Senol Yildiz  
Istac As  
TURKEY

Martin Andreas Vik  
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Tomas Vorisek  
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MIT  
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Takafumi Usui  
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Syracuse University  
USA

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Syracuse University  
USA

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Afe Babalola Univ  
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Emerald Energy Inst  
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Xuemei Zheng  
University of Queensland  
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Christian Zeyer  
SwissCleanTech  
SWITZERLAND

Yulia Woodruff  
McKinsey and Company  
UNITED KINGDOM

Kingsley William  
Emerald Energy Inst  
NIGERIA

Ludwik Zembala  
AGH University of Science and Technology  
POLAND

International Association for Energy Economics  
2013 Financials

Income
Membership Dues  $411996
Meeting Income  35955
Publication Subscriptions & Sales  216402
Scholarship & Other Contributions  56446
Interest Income  1795
Merchandise Sales, Net of Costs  925
Total  $723519

Expenses
Administration  $328610
Marketing & Development  9048
Student Programs & Scholarships  55471
Awards & Gifts  10379
President’s Expenses  9357
Other Program Expenses  53476
Publication Expenses
   Energy Journal  162988
   EEEP  42254
   Energy Forum  25207
   Working Paper Series  3000
Total  $699790
Net Income  $23729
IAEE’s New Lebanon Affiliate Launched

On March 21, 2014, the members of the newly created Lebanon Affiliate of the IAEE held their first seminar sponsored by AUB’s Masri Institute. Dr. N. Ghaddar, AUB’s Associate Provost and Dr. Isabella Ruble, Associate Professor of Economics, the Affiliate’s first President, welcomed Dr. Gurkan Kumbaroglu, IAEE’s VP in Beirut. Dr. Kumbaroglu presented his latest research ‘Transition Pathways Towards a Low Carbon Economy: The Case of Turkey’. The celebration of the newly created chapter coincided with AUB launching its new MS in Energy Studies, an interdisciplinary Master’s program under the Division of University Interdisciplinary Programs, integrating engineering, science and economics, as well as policy aspects of energy systems. The aim of the program is to fill a gap in the energy field in the region and to form the next generation of stakeholders and leaders in the region. The IAEE’s Lebanon Affiliate will provide a new platform for researchers, policy makers and other stakeholders to more efficiently participate in Lebanon’s transition from an energy importer to a potential regional exporter of natural gas. Many new student and faculty members as well as some official stakeholders attended the event.
SPECIAL OFID/IAEE SUPPORT FUND FOR STUDENTS FROM DEVELOPING COUNTRIES

IAEE is pleased to announce the continuation of a special program offering conference support to IAEE student members from developing countries (for a list of qualifying countries please visit http://www.iaee.org/documents/LIC.pdf). Your country of origin must be on this list for support to be considered. The program covers four of the Association’s conferences in 2014. This program is generously underwritten by the OPEC Fund for International Development (OFID) and the International Association for Energy Economics. The program covers transportation and lodging reimbursement up to $1750.00 plus waiver of conference registration fees for a limited number of qualifying students. Note: you must be (1) from a qualifying country, (2) a current IAEE member, (3) registered as a full-time student in a program of study and (4) be enrolled in full-time PhD academic coursework during the application stage as well as during the conference to be attended. It is further strongly suggested that you submit a paper for presentation at the conference you wish to attend and receive this support. The conferences included in the program are the 7th NAEE/IAEE International Conference in Abuja, Nigeria, February 17-18, 2014, the 37th IAEE International Conference in New York City, USA, June 15-18, 2014, the 4th IAEE Asian Conference in Beijing, China, September 19-21, 2014 or the 14th IAEE European Conference in Rome, Italy, October 28-31, 2014.

Application deadlines for these conferences are as follows: Abuja Conference – application cut-off date, November 15, 2013; New York City Conference – application cut-off date, March 13, 2014; Beijing Conference – application cut-off date, June 17, 2014; Rome Conference – application cut-off date, July 14, 2014.

Please submit the following information in one succinct email (e.g., all below materials sent in the same email – including your professor’s letter of recommendation) electronically to iaee@iaee.org to have your request for support considered. Make the subject line of your email read “Application to OFID/IAEE Support Fund (mention the conference you wish to attend).”

• Full name, mailing address, phone/fax/email, country of origin and educational degree pursuing.
• A letter stating you are a full-time graduate/college student during the application stage as well as during the time of the conference you wish to attend, a brief description of your course work and energy interests, and the professional benefit you anticipate from attending the conference. The letter should also provide the name and contact information of your main faculty supervisor or your department chair, and should include a copy of your student identification card.
• Indication of whether or not you have submitted an abstract to the conference you wish to receive OFID/IAEE Support to attend.
• A letter from your academic faculty, preferably your faculty supervisor, recommending you for this support and highlighting some of your academic research and achievements, and your academic progress.
• A cost estimate of your travel/lodging expenses to participate in your conference of choice.

Please note that students may apply for this support at only one of the above conferences. Multiple requests will not be considered. Further note that you must be a student member of IAEE to be considered for this support. Membership information can be found by visiting https://www.iaee.org/en/membership/application.aspx

Applicants will be notified whether their application has been approved approximately 21 days after the applicable application cut-off date, above. After the applicant has received IAEE approval, it will be his/her responsibility to make their own travel (air/ground, etc.) and hotel accommodations to participate in the conference. Reimbursement up to $1750.00 will be made upon receipt of itemized expenses and after the conference is held. The reimbursement will only cover transportation and lodging expenses. No other expenses will be covered (e.g., paying for Visa’s/Passports, meals outside the conference provided meal functions); no more than three nights lodging will be covered.

For further information regarding the IAEE support fund for students from developing countries to participate in our conferences in 2014, please do not hesitate to contact David Williams at 216-464-5365 or via e-mail at: iaee@iaee.org

For a list of qualifying countries please visit http://www.iaee.org/documents/LIC.pdf If your country of origin is not on this list your application for support will not be considered.

Member-Get-A-Member Campaign Continues Success

Ingmar Sterzing Wins Complimentary Registration to New York International Conference

IAEE’s Member-Get-a-Member campaign was a grand success in the June 1, 2013 to December 31, 2013 period with 21 new members added in that period as a direct result of the program.

Members had their membership expiration date advanced three months for each new member referred. Ingmar Sterzing with Westinghouse, referred the most new members: 3. He won a complimentary registration to the New York International Conference as a result.
Calendar

04-07 May 2014, 2nd Annual Crisis and Risk Management Summit at Radisson Blu Hotel, Al Bida Road, Kuwait 26199, Kuwait. Contact: Vidhya, Suman, IQPC, Studio City Tower, 8th Floor, Dubai Studio City, Dubai, United Arab Emirates. Phone: 971 4 364 2975, Email: enquiry@iqpc.ac, URL: http://atnd.it/6139-1,

05-07 May 2014, Groundwater Summit at Westin Denver Downtown. Contact: David, Evener, National Ground Water Association, 601 Dempsey Rd., Westerville, OH, 43081, USA. Phone: 614 898.7791, Fax: 614 898.7786, Email: ngwa@ngwa.org, URL: http://www.ngw.org/.

06-08 May 2014, 4th Annual Global Petrochemicals Technology Conference at Grand Hyatt Doha Hotel, Doha, Qatar. Contact: Ajay Nimbalkar, Mr., Fleming Gulf, Doha, Qatar. Phone: +97146091570, Fax: +97146091589, Email: ajay.nimbalkar@fleminggulf.com, URL: http://energy.fleminggulf.com/global-petrochemicals-technology.

06-06 May 2014, Mozambique National Mining Law Update at Johannesburg, 2001, South Africa. Contact: African Influence Exchange, African Influence Exchange, South Africa. Phone: 27 0817770028, Email: enquiry@africaninfx.com, URL: http://atnd.it/7248-0,

07-09 May 2014, LNG Technology, Processing and Operations at Informa Australia, St Georges Terrace, Perth WA, 6000, Australia. Contact: Informa Australia, 2/120 Sussex St, Sydney, 2000, Australia. Phone: +61 2 9760 4300, Email: Info@informa.com.au, URL: http://atnd.it/6496-0,

07-07 May 2014, Gas Industry and Market Fundamentals at Informa Australia, Collins Street, Melbourne, 3000, Australia. Contact: Informa Australia, Informa Australia, Collins Street, Melbourne, Victoria, 3000, Australia. Email: Info@informa.com.au, URL: http://atnd.it/6459-0,

08-09 May 2014, Smart Grid World Summit 2014 at Royal Garden Hotel, 2-24 Kensington High Street, Kensington, London, W8 4PT, United Kingdom. Contact: James, Moss, Smart Grid World Conference, Adamson House, Towers Manchester, East Didsbury, Manchester, England, M20 2YU, United Kingdom. Phone: +44 (0)161 955 4236, Email: info@smartgridworldconference.com, URL: http://atnd.it/8210-0,

12-16 May 2014, International Gas Value Chain Course at Amsterdam, The Netherlands. Contact: Janet Smid, Account Manager, Energy Delta Institute, Netherlands. Phone: 310881166825, Email: smid@energydelta.nl, URL: http://www.energydelta.org/mainmenu/executive-education/introduction-programmes/international-gas-value-chain,

13-14 May 2014, Gas Portfolio Optimisation at The Kingsley Hotel, Bloomsbury Way, London, WC1A 2SD, United Kingdom. Contact: Helen, Orry, Incisive Media, 32-34 Broadwick Street, London, London, W1A 2HG, United Kingdom. Phone: +44(0) 20 7484 9875, Fax: +44 (0)207 484 9797, Email: Helen.Orry@incisivemedia.com, URL: http://atnd.it/6699-1,

13-15 May 2014, WEPOWER at Dhahran International Exhibition Center, 4344 Exhibition Road, Rakkah, Damman, 34213, Saudi Arabia. Contact: Mark , Thomas, BME Global, 0. Phone: 02033286521, Email: mark@bme-global.com, URL: http://atnd.it/6915-0,

13-14 May 2014, African Utility Week at Cape Town International Convention Centre, Cape Town. Contact: Viviana, Fuso, Clarion Events, Spintelligent House 31 Bell Crescent Westlake Business Park, Cape Town, 7945, South Africa. Phone: 21 700 3500, Fax: 21 700 3501, Email: info@spintelligent.com, URL: http://atnd.it/15YQUHu,

14-16 May 2014, Russia and CIS Coal at Intercontinental Moscow Tverskaya Hotel, Tverskaya Street 22, Moscow, 125009, Russia. Contact: Informa Australia, Informa, Level 2, 120 Sussex St, Sydney, NSW, 2000, Australia. Phone: +61 2 9080 4300, Email: info@informa.com.au, URL: http://atnd.it/6304-0,

14-16 May 2014, Strategic Procurement and Expediting for Oil and Gas Asia 2014 at IQPC Asia, 3 Jalan Steen Sentral, Kuala Lumpur, 50470, Malaysia. Contact: Susy, Ansgaryn, IQPC, 61 Robinson Road, 14-01, Robinson Centre, Singapore, 068893, Singapore. Phone: +6567229388, Email: susy.ansgaryn@iqpc.com.sg, URL: http://atnd.it/6792-0,

19-22 May 2014, 4th International Conference E/E Systems for Wind Turbines at IQPC Gesellschaft für Management Konferenzen mbH, Friedrichstrasse 94, Berlin 10117, Germany. Contact: Vasiliki Barakaki, IQPC Germany, Friedrichstrasse 94, Berlin, 10117, Germany. Phone: 030 2091 3229, Email: barakaki.vasiliki@iqpc.de, URL: http://atnd.it/5502-0,


19-21 May 2014, Arctic Patrol and Reconnaissance at Royal Danish Defence College, Forsvarsakademiet, Svanemollens Kaserne, Ryvangs Alle 1, København, 2100, Denmark. Contact: Virginia, Baker, IQPC, 129 Wilton Road, London, SW1V LZZ, United Kindom. Phone: +44 207 368 9737, Fax: +44 (0) 207 368 9301, Email: enquiry@defenceiq.com, URL: http://atnd.it/6806-1,

20-22 May 2014, 3rd International Conference Offshore Cabling 2014 at Swissotel Bremen, Himmelpaltz 20, Bremen 28195, Germany. Contact: Vasiliki Barakaki, IQPC Germany, Friedrichstrasse 94, Berlin, 10117, Germany. Phone: 030 2091 3229, Email: barakaki.vasiliki@iqpc.de, URL: http://atnd.it/5938-0,

20-22 May 2014, Sap Asia Pacific Conference for Utilities at Suntec Convention Centre, 1 Raffles Boulevard, Suntec City, Singapore 039593, Singapore. Contact: Alice, Kenning, T.A Cook, 4th Floor, McLaren Building, 46 The Priory Queensway, Birmingham, West Midlands, B4 7LR, United Kingdom. Phone: 44 121 200 3810, Email: a.kenning@tacook.com, URL: http://atnd.it/6750-0,

20-22 May 2014, 3rd International Conference Offshore Cabling 2014 at Swissotel Bremen, Himmelpaltz 20, Bremen 28195, Germany. Contact: Vasiliki, Barakaki, IQPC Germany, Friedrichstrasse 94, Berlin, 10117, Germany. Phone: 030 2091 3229, Email: barakaki.vasiliki@iqpc.de, URL: http://atnd.it/5938-0,

27-30 May 2014, Global Anti-Corruption & Compliance in Mining at Kensington Close Hotel, Wights Lane, London W8 5SP, United Kingdom. Contact: Bilal Azmat, Resourceful Events, Level 7, 30-32 Carrington Street, Sydney, NSW, 2000, Australia. Phone: 020 7216 6080, Email: bilal.azmat@resourcefulevents.com, URL: http://atnd.it/5635-0,