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THE OXFORD
INSTITUTE
FOR ENERGY
STUDIES

A RECOGNIZED INDEPENDENT CENTRE OF THE UNIVERSITY OF OXFORD



Oxford Institute for Energy Studies



Annual Report 2014

About the Oxford Institute for Energy Studies

The Oxford Institute for Energy Studies (OIES), a Recognized Independent Centre (RIC) of the University of Oxford, was founded in 1982 as a centre for advanced research into the social science aspects of energy. A non-profit-making charity, it is distinguished from similar institutions elsewhere in the world in two important ways.

First, the OIES is committed to achieving the highest academic standards. The University of Oxford and three of its colleges – St Antony's, St Catherine's, and Nuffield – are Members of the Institute and occupy seats on the Board of Governors.

Second, the OIES is committed to the idea of cooperation between scholars representing different sides of the international energy debate. Members of the Institute represent both the oil-producing and oil-consuming nations, and this international character is also reflected in the composition of the research team. Such cooperation is intended to lead to a more informed debate on the behaviour, motivations, and objectives of the various agents operating on the international energy scene.

This combination of academic excellence with attention to pressing real-life problems in the energy world provides a unique forum in which study and discussion can take place. Research carried out at the OIES is designed to encompass the following disciplines:

- the economics of petroleum, gas, coal, nuclear power, solar, and other forms of renewable energy;
- the politics and sociology of energy;
- the international relations of oil- and gas-producing and consuming nations;
- the economic development of oil- and gas-producing countries and the energy problems of other developing countries; and
- the economics and politics of the environment in its relationship with energy.

As a general policy, the OIES concentrates on research into energy issues of international significance or which have implications for the interface of producers and consumers.



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Message from the Chairman

The year 2014 saw important management changes at the institute. Christopher Allsopp retired as director and assumed the position of non-executive president until December 2014, Dr Bassam Fattouh was appointed director as of January 2014, while I was greatly honoured to be appointed chairman of the board of governors, succeeding Adrian Lajous. Adrian has been a wonderful chairman over the period 2003–2013 and the board thanked him for his dedicated service at a special dinner in his honour.

There were several changes to the board, including the resignations of Mr Kristopher Smith, Suncor Energy Inc., and Mr Haitham Al Ghais, Kuwait Petroleum Corporation. I thank them for their support of the institute's activities. New governors who joined the board in 2014 are: Professor Gordon Clark, Director of the Smith School of Enterprise and the Environment, University of Oxford; Mr Mohammad Al Hadlaq, Manager, European Regional Office, Kuwait Petroleum Corporation; and Mr Steve Reynish, EVP, Strategy and Corporate Development, Suncor Energy Inc.

The institute's capacity to continue with its research activities depends heavily on the continued generosity and support of our benefactors. We were therefore very pleased to welcome Argus Media, Delonex Energy, and ICAP Energy to our roster of current benefactors.

The institute is indebted to Christopher Allsopp, who ably served as OIES director from 2006 to 2013. I must further thank him for agreeing to remain at the institute in an advisory capacity.

The selection of the new director focused on the need to build on the institute's success and the ongoing drive to reinforce its research structure whilst adapting to changing circumstances. After a rigorous selection process, the board was delighted to appoint Dr Bassam Fattouh to the post.

Dr Fattouh was deputy director of the institute and director of the Oil and the Middle East Programme. He is editor of the *Oxford Energy Forum*, assistant director of the Oxford Energy Seminar, and honorary secretary of the Oxford Energy Policy Club, as well as professor and academic programme director of international management (Middle East and North Africa) qualifications at the Department of Financial and Management Studies (DEFIMS) at SOAS, University of London. It was the clear and unanimous choice of both the selection committee and board that he be appointed as the next director of the institute.

Dr Fattouh has been engaged in work on energy commodities for many years, particularly oil/oil products and Middle East and North African energy, subjects on which he has published widely. He has close links with academic institutions across the globe and is an acknowledged expert in his field.

Dr Fattouh has the full support of the board as he takes up his new role, and we are confident in his ability to provide strategic leadership for the institute, develop and implement the institute's research strategy, strengthen the institute's capacity, and attract and retain a balanced research staff. In addition, we are confident that he will deepen ties with our member colleges and Oxford University and raise additional resources to fund general research activities and specific research projects whilst maintaining good relations with existing benefactors, sponsors, and supporters.

I wish to thank all the staff of the institute for their continued hard work and dedication in 2014. I am pleased to see the institute's increased use of its website as a publication vehicle for views and commentaries on a wide range of current energy issues and subjects. I would like to thank staff members who have moved on from the institute to other endeavours and welcome those who have joined the institute recently.

I am confident that with the continued support of our benefactors and the board, the institute will go from strength to strength under the directorship of Bassam Fattouh and will continue to contribute to a deeper and wider understanding of the forces that underlie the international energy debate.

Roger Ainsworth
March 2015

Director's Note

The institute's main objectives are to undertake advanced research on issues currently affecting the world's energy sector, and to help inform the public debate and improve understanding of the political economy of energy. As an educational charity, the OIES is committed to the dissemination of the results of its research as widely as possible, both in academia and in the world at large, through its website, attendance at seminars and conferences around the world by its fellows, its own seminars and events, and its interaction with the media. The institute's work is detailed in this report.

Research and Dissemination

The institute publishes a range of research publications and commentaries, all of which are made freely available on its website, with the exception of published books and monographs. This report details ongoing research and highlights a selection of the papers published by the institute in 2014 on a wide range of subjects. The OIES also published 16 'Energy Comments': shorter papers, often devoted to current policy issues. The institute also publishes a quarterly journal, the *Oxford Energy Forum*, now in its 25th year.

The Russian Gas Matrix – How Markets Are Driving Change, a book edited by James Henderson and Simon Pirani, was published by the Oxford University Press in May 2014. It analyzes how the dramatic changes in international natural gas markets since the 2008 economic crisis have impacted on Russia, one of the world's largest gas producers and consumers. The book considers the many challenges faced by Gazprom, Russia's dominant gas company, including: new pricing trends and regulatory regimes in Europe, its main export market; increased competition in Russia itself; far-reaching change in CIS markets; and a long, difficult path to the Asian export market that it hopes to open up. The authors underline that gas remains a political priority for Moscow, and that government action will be decisive.

2014 also saw the publication of a book by Elham Hassanzadeh entitled *Iran's Natural Gas Industry in the Post-Revolutionary Period – Optimism, Scepticism and Potential*. The book describes the historical, political, and economic developments which have led to Iran's failure to engage in the international gas trade at a material level, despite its world-class reserves. It also outlines the domestic political situation and the dilemmas faced by qualified Iranian authorities, as well as the challenges facing the Iranian government in allocating its vast natural gas resources to competing uses, including the domestic market, exports, and oilfield reinjection.

Staffing

In January 2014, Bassam Fattouh took up the role of director of the OIES and Christopher Allsopp became non-executive president.

We were joined by Rahmat Poudineh and Scott McLachlan, while we bade farewell to: Margaret Ko and Lavinia Brandon, who both retired from the OIES after many years of service; Dr Lavan Mahadeva, who moved on to take up a position in London; Dr Elham Hassanzadeh, who left after completing work on her book; Dr Benito Müller, who left to focus his attention on his role as director of Oxford Climate Policy; and Dr Shamil Yenikeeff, who left the OIES to start his own consultancy.

Dr Rahmat Poudineh joined as lead research fellow on the OIES Electricity Programme. He was formerly a researcher at Durham University, where he worked on energy research projects and finished his PhD in energy economics. He has an MSc in energy economics and policy from the University of Surrey, a graduate diploma in economics from Queen Mary University of London, and a BSc in aerospace engineering from Amirkabir University of Technology (Tehran Polytechnic).

Scott McLachlan joined the OIES as librarian, and he is tasked with the reorganization and maintenance of the live collection, identifying and introducing a suitable online library platform, and increasing the value of the collection as a resource for OIES fellows and the wider energy audience. He has extensive experience, having worked at the Bank of England, Ruskin College, the Institute and Faculty of Actuaries, and St. Vincent's Hospital Library. He has an MA in library and information science from Simmons College, Boston and a BA in English from the University of Massachusetts, Boston.

The OIES-Saudi Aramco Fellowship, made possible by the generosity of Aramco Overseas Company, attracted numerous applications in 2014. Three OIES-Saudi Aramco Fellows joined us: Mari Luomi, a

writer at the International Institute for Sustainable Development Reporting Services, holds a PhD in the politics of the Middle East from the University of Durham and was a CIRS post-doctoral fellow at the Georgetown University School of Foreign Service in Qatar from 2011 to 2013; Siew Hua Seah, a postgraduate student at SOAS, pursuing an MSc in the political economy of development; and Yingying Wu, a PhD candidate at the International Capital Market Association (ICMA) Centre, University of Reading, where she received an MSc in international securities, investment and banking.

We were also pleased to welcome four new research associates – Luke Patey, Mari Luomi, Amrita Sen, and Sylvie Cornot-Gandolphe – all of whom made valuable contributions to OIES research this year. We also welcomed three visiting researchers during the year: Professor Abdullah Al-Mansour, Assistant Professor at King Fahd University of Petroleum and Minerals (KFUPM), Saudi Arabia; Dr Suleiman Sa'ad, from the Nigerian Defence Academy; and Fabian Weber, who is studying for a master's in international energy at the Paris School of International Affairs (PSIA) Sciences Po.

We have been fortunate to work with a number of contributing authors throughout the year, and we extend our thanks to the following for their contribution to the work of the OIES:

- **John Bower**, an adviser to the UK government on electricity market economics, and a former OIES senior research fellow.
- **Craig Brown**, a business development manager with Keystone Engineering Inc.
- **Virendra Chauhan**, an oil analyst at Energy Aspects.
- **Etienne Durand**, a PhD student and temporary teaching and research attaché at the Centre d'Études Européennes, Université Jean Moulin, Lyon.
- **Pedro Florencio**, a member of the Brazilian Senior Executive Service and a PhD candidate at the University of Warwick.
- **Anne Fruehauf**, a senior vice president at Africa Teneo Intelligence.
- **Rolando Fuentes**, a former visiting research fellow at the OIES and currently director of Verde Economista SC, an energy consultancy based in Mexico.
- **Muna Husain**, an assistant professor at the Department of Economics, University of Kuwait.
- **Adi Imsirovic**, works as general manager at Clearsource Commodity Services Ltd.
- **Julia Loe**, a senior consultant at Menon Business Economics in Norway.
- **Richard Mallinson**, an international affairs and policy analyst at Energy Aspects.
- **Nyrie Palmer**, a senior regulatory officer at NSW Resources and Energy, Australia.
- **Shweta Upadhyaya**, an energy analyst at Energy Aspects.
- **Maarten van Mourik**, an independent oil market analyst.

We continue to seek researchers keen on studying oil and gas, their markets, electricity, and climate change, as well as the Middle East, its central role in hydrocarbons, and the changing structure of the industry and its investment challenges.

Activities and Events in 2014

The annual 'Gas Day', held in October 2014, was filled to capacity, with discussions focusing on the Russia-Ukraine crisis and LNG supply growth. The 2014 'Oil Day' – kindly sponsored by ICE – was entitled 'Global Shifts in Oil Markets and Financial Regulation: Implications for Pricing Benchmarks'.

In addition to the annual Oil Day, the OIES organized a conference, kindly supported by the Kuwait Foundation for the Advancement of Sciences, entitled 'Future Energy Challenges for the GCC States'.

The institute's annual 'Brainstorming Meeting' took place in Stockholm in June; we are very grateful to the Swedish Energy Agency for their generous sponsorship and support of this event.

The institute continues its programme of internal seminars, which are advertised throughout the University of Oxford.

General

The interactive and networking aspects of the institute continue to benefit greatly from the close historical and current relationships with its two sister institutions: the Oxford Energy Policy Club, which meets twice annually at St Antony's College; and with the Oxford Energy Seminar, held annually at St Catherine's College.

Our thanks to the OIES administrative team – Kate Teasdale, Susan Millar, Lindsey Barker, Jo Ilott, and Hannah Shipton – who ensure the smooth running of the institute.

Finally, we must acknowledge and thank our benefactors, sponsors, and friends for their kind support, without which the research conducted at the OIES would not be possible.

March 2015

Research

The institute publishes a range of research publications and commentaries, all of which are made freely available on its website, with the exception of published books and monographs. This report details ongoing research and highlights a selection of the papers published by the institute in 2014.

Global Oil Market Dynamics

Convenience Yields of Energy Commodities: Determinants and Implications

Yingying Wu

During the last decade, commodity prices have experienced roller-coaster type movement and caught the attention of consumers, investors, and regulators. A thorough investigation of energy commodity market dynamics is timely, given the vital role commodity prices play in the economy and consumer welfare. Futures prices carry a substantial amount of information about commodity markets, as trading of most commodities takes place mainly in the futures market. The classic theory of storage, which is based on the 'no arbitrage' principle, defines a commodity futures price as the sum of the spot price and costs of carry. The latter is comprised of interest forgone, marginal convenience yield, and marginal warehouse cost. The convenience yield, a stylized feature unique to each underlying commodity, represents the flow of services for the physical holder of the storable commodity. The convenience yield connects current and expected market conditions in the future through the storage decision, thus affecting the commodity market dynamics. In this investigation, the otherwise unobservable convenience yield series will be extracted by modelling the instantaneous convenience yield and other factors. The paper then proceeds by further testing energy sector related factors, such as inventory levels and OPEC activities. Moreover, the paper will examine the function of inventory as a buffer against the uncertainty of both the commodity-specific and macroeconomic conditions. The paper will also discuss the extra benefit of publicly announced inventory data on oil and gas.

The Prospects and Challenges for Arctic Oil Development

James Henderson & Julia Loe

As the potential of the Arctic's geology is revealed and the shrinking ice cap makes drilling an increasingly feasible activity, the region's role in global petroleum supply over the coming decades is becoming a subject of increasing interest. Nevertheless, significant concerns remain, not least the potential impact of any hydrocarbon E&P activity in an environmentally sensitive region. In addition, the lack of existing infrastructure and the likely high cost of any development in geographically remote and climatically harsh conditions mean that the economics of any new project will depend to a large extent on the size of discoveries and the oil price. In turn, this will be impacted by the development of other sources of oil supply (such as US unconventional oil) and alternative energies. As a result, although increased activity in a number of Arctic countries suggests that the region could become a major source of future oil supply, there are a number of challenges – including the impact of sanctions resulting from the Ukraine crisis – to be met before this potential can be realized.

The objective of this paper (published in November 2014) is to provide an updated overview of offshore oil and gas developments in the Arctic and to discuss the potential for large-scale development of the region as a petroleum province over the next 20–30 years, thereby providing a starting point for future production estimates and for analyzing how relevant such estimates may be for global oil (and gas) markets. The paper argues that the most likely Arctic offshore areas to be developed first are the Barents Sea and the Kara Sea, but that various factors – political, commercial, technological, and environmental – have the potential to hamper petroleum development, particularly if the conflict between Russia and the international community continues to escalate, as partnership will be critical if Russia's Arctic resources are to be developed successfully.

The Shifting Geography of Russia's Hydrocarbon Exports

James Henderson

The crisis in Ukraine and the resulting focus on Europe's dependence on Russian sources of energy has set alarm bells ringing in Brussels, but has also highlighted to the Kremlin that it is very reliant on export

revenues from the West. A shift to Asia has begun, and is moving forward rapidly in both the oil and gas sectors. Furthermore, China in particular is becoming a source of financing for a number of projects in Russia as well as for the major state companies, especially Rosneft. This paper tracks the move in oil and gas sales from west to east and questions whether Russia may already be becoming overly dependent on one country, China, for its hydrocarbon export sales. One initial conclusion is that Europe has little to worry about in terms of security of supply because Russia will soon be as keen to develop western routes to balance its sales to China as it has recently been to diversify away from Europe to the east.

Resource-Rich Economies

MIDDLE EAST

Prospects for Renewable Energy in GCC States – Opportunities and the Need for Reform

Laura El-Katiri and Muna Husain

This study, published in September 2014, explores the economic potential for, and possible caveats of, renewable energy in the GCC countries. Looking at the case of Kuwait, the authors highlight the growing potential for economic cost savings, primarily for solar photovoltaic power over oil-fired power generation, in the current environment of high global oil prices. The economic benefits of solar power versus gas-fired power generation in the GCC are less obvious, though rising LNG imports by some GCC countries (chiefly Kuwait, the UAE, and possibly Bahrain) are expected to improve these economics in the future. There are also some important caveats when considering the use of renewable energy in the region. Highly distorted domestic energy markets that continue to price fuel at a fraction of its shadow economic cost provide few market-based incentives for utilities to switch towards renewables. The recent emphasis on the use of renewable energy policies for the creation of 'green' jobs by GCC policymakers may increase, rather than reduce, unproductive economic sinks across the GCC states' domestic energy industries, which would in turn considerably dilute, if not call into question, any economic gains to be made from renewable energy in the GCC.

The Political Economy of Oil in Post-Conflict States

Laura El-Katiri

Natural resource wealth is frequently said to inhibit economic growth and to abet and prolong political conflict both across and inside national borders. High resource concentrations of oil have been particularly associated with political conflict, owing primarily to the enormous resource rent potential offered by control over these resources. The fundamental role played by oil export rents as a powerful source of income raises incentives for different sides of a national or cross-border conflict to fight for control over these resources, while the ensuing rental income stream to whoever is eventually in control provides a formidable source of income during times of conflict. Oil also has a critical role to play in the political economy of resource-endowed post-conflict states, a relationship that has so far received little academic attention. This study aims to fill a gap in the literature, looking both at the roles played by oil during conflict and in its aftermath at the stage of state reconstruction. Using case studies, the paper aims to derive a general set of channels of interaction between oil and national post-conflict state-building.

A Roadmap for Renewable Energy in the Middle East and North Africa

Laura El-Katiri

Home to more than half of the world's crude oil and more than a third of its natural gas reserves, the MENA region has, for the past fifty years, gained enormous significance as a global producer and exporter of energy. The MENA region is already a major energy consumer, and is forecast to continue to account, alongside Asia, for the majority of the world's energy demand growth well into the 2030s; placing domestic energy policies at the heart of the region's economic agendas for the coming decades. This paper, published in January 2014, argues that renewable energy – most importantly solar power, with its particular regional climatic advantage – could play a significant role as a cost-competitive alternative to conventional fossil fuels, if the full opportunity cost of domestically consumed oil and natural gas resources is fully priced into the regional energy system. The absence of cost-reflective energy and electricity tariffs in the MENA region today currently conceals this

potential cost advantage; and leaves renewable energy deployment subject to further, economically distorting, policies such as renewables targets and fiscal incentives. Systematically opening up the economic opportunities offered by renewable energy to the MENA region will hence require structural reform of regional energy market and pricing mechanisms, thereby rationalizing the use of different energy sources in each domestic market.

The US Tight Oil Revolution and Its Impact on GCC Countries: Beyond the Supply Shock – published

Bassam Fattouh

While the impact of the increase in US production on prices and on oil market dynamics is yet to be fully felt, as some of the underlying forces still need time to unfold and be fully understood, it is important to provide a general framework to help us analyze the US shale revolution and its potential impacts on oil markets and key Middle East producers. This paper, published in October 2014, proposes a broad framework based on three main aspects: the US tight oil revolution as a positive oil supply shock – with the potential to transform into a global supply shock if hydraulic fracturing technology successfully diffuses to other parts of the world; the US tight oil revolution as a force disrupting the existing trade flow patterns of crude oil, petroleum products, condensates, and NGLs; and the development of US shale as a powerful force behind the shift in market perceptions, not only from a position of oil scarcity to one of oil abundance, but also as a shift in terms of a US aspiration to achieve energy independence and how this would impact US foreign policy and its relations with other players, including key Middle East oil exporters.

Oil and Gas Policy in the Kurdistan Region of Iraq

Robin Mills

The autonomous Kurdistan Region of Iraq (KRI) has emerged as one of the world's most important new oil & gas exploration plays. Its petroleum resources, although smaller than those of the rest of Iraq, have key strategic importance for the KRI's relations with the rest of Iraq and the 'disputed territories', its future and possible moves towards independence, and energy supplies to neighbouring Turkey and on to the EU. International oil companies from a variety of countries play important operational, financial, and – to an extent – political roles in the KRI. However, full development of the KRI's oil and gas has been held up by continuing disputes with the central government in Baghdad. These relate both to the scope of regional versus federal powers over oil contracts, exports and revenues, as well as wider disagreements over the future shape of Iraq. Though the KRI situation is in some ways *sui generis*, it has implications for other oil-endowed parts of Iraq, as well as for other countries with uneven distributions of petroleum resources.

The International Relations of the Green Economy in the Gulf – published

Mari Luomi

This study examines how the resource-rich GCC countries are positioning themselves in the international relations of the green economy, focusing on the UAE's state-led efforts to acquire the means of implementation for a national green energy transition. The study addresses four questions: What strategies, external relations, and engagements have the UAE and other GCC states developed over recent years that support a transition to a green energy economy? How are these engagements providing the means of implementation for a green economy transition? Are the national policy frameworks aligned with such a transition? What lessons can be drawn from the UAE's experience by the other GCC states? The study concludes that, as the case of the UAE demonstrates, there are multiple ways in which the GCC states can actively employ their financial resources through external engagements to support a broader national green economy vision. However, enabling environments which are crucial for directing investments into green activities, jobs, and infrastructure, are only beginning to emerge, and a lot of work still remains to be done in all six states, particularly in the areas of energy subsidy reform and sustainable job creation in productive sectors. The study closes with a number of related observations and recommendations.

Natural Gas in Lebanon and Its Export Options

Bassam Fattouh and Laura El-Katiri

Lebanon is the Levant's most recent candidate to launch an offshore bidding round, the first in the country's bid to become yet another gas province in the East Mediterranean. Lebanon's waters are believed to hold significant hydrocarbon potential for both natural gas and oil, making offshore Lebanon a potentially attractive location for new greenfield investors. A long-term importer of primary energy for all of its energy needs, Lebanon's faltering economy could tremendously benefit from its expected hydrocarbon wealth. Currently, Lebanon plans to import short-term LNG to replace oil in power generation, but the successful development of the country's offshore resources could reverse this trend within less than a decade, turning Lebanon into a self-sufficient producer and a potential exporter of natural gas. The authors discuss and reflect on different export options as Lebanon looks to monetize its own small gas revolution.

RUSSIA

The Future of Russian Oil Demand

James Henderson

Russia's refining system is being upgraded to meet European specifications and also to satisfy the increasing needs of Russian consumers for higher quality oil products, especially gasoline and diesel. This research will attempt to map the changing trends in Russian oil demand and to match them with the changing profile of the oil product mix being produced by Russia's refining sector. This will establish what surpluses, if any, will be available for export (primarily to Europe) and where any deficits may require imports. The research will also review the changing tax system for downstream businesses in Russia and what impact this may have on the supply and demand balance for oil products in the country.

OTHER RESOURCE-RICH ECONOMIES

Kenya: An African Oil Upstart in Transition

Luke Patey

In 2012, Kenya became the latest East African country to enter the oil and gas scene. The discovery of oil resources in Turkana County provided an extra boost to Kenya's already growing and diverse economy, but significant political, social, and security challenges remain. This paper, published in October 2014, analyzes the opportunities and risks facing Kenya's oil industry and its role as a regional oil transport hub.

Based on current discoveries, Kenya may very well become only a small African oil producer, though its role as a regional hub for East African crude oil and petroleum products may be more significant. However, as Kenya's oil industry moves from exploration to development and potential production, risk incentives for the involved oil companies will decline profoundly in what remains a shifting political and security landscape. Despite lofty regional infrastructure plans, a piecemeal approach may need to be adopted, beginning with a basic export pipeline from Uganda and a port terminal on Kenya's coast.

Before the Boom: Prospects and Pitfalls for East Africa Oil

Luke Patey

East Africa has been transformed into an oil hotspot in recent years, with hopes high across the region that future oil production and exports will energize foreign investment and economic growth. Ongoing exploration and development work will change the face of the African oil map by adding another oil-rich region on the continent alongside West and North Africa. Uganda is preparing to bring its oil reserves onstream and begin exports by the end of the decade, while Kenya announced a major oil find in 2012 that promises to bolster its position as a regional hub and African economic heavyweight.

But there remain threats to budding oil industries in East Africa. A number of economic, political, geopolitical, and technical challenges may dampen and delay the prospects. South Sudan remains embroiled in an internal conflict that has shut down almost half of its production and deflated hopes for new exploration and its involvement in new regional pipelines. In Uganda, even though the first oil discoveries were

made in 2006, the construction of a new export pipeline has still not begun. At first, delays were caused by a dispute between the Ugandan government and oil companies over the construction of a domestic refinery. More recently, a feud over capital gains tax has threatened to stall the oil industry's advance. In Kenya, after a string of discoveries beginning in 2012, the implementation of a multi-billion dollar regional infrastructure project, including a pipeline from Uganda, has been slow to start. Its potential development may also serve to further complicate relations in the future between South Sudan and Sudan.

The research analyzes the opportunities and challenges facing East Africa's oil industries from a country-specific and regional perspective. It provides an overview of the potential production and reserves potential as well as the political, security, and social risks in Uganda, Kenya, and South Sudan. The paper also considers how industry developments will influence possibilities for regional cooperation and conflict.

EMERGING ECONOMIES

Silent Revolution: An Analysis of India's Rise as Asia's Largest Exporter of Refined Products

Nilav Bose

Over the last decade, India has evolved into a large exporter of refined petroleum products. In order to achieve national self-sufficiency in refining capacity, India's government began encouraging energy companies to invest in refineries in the 1990s. By 2001, this had helped the country become a net exporter of petroleum products for the first time. Since 2003, India's refining capacity has grown at an average rate of 5.4 per cent annually and stood at 4.35 million bbl/d at the end of 2013, making India the second-largest refiner in Asia after China. India projects an increase of the country's refining capacity to 6.3 million bbl/d by 2017, which would represent a much higher 9.6 per cent growth annually over the next four years. Although India still imports some refined products, its product exports have been growing at an average rate of about 14 per cent since 2004. In 2012, India was the fourth-largest petroleum exporter in the world and the largest in Asia. A combination of public-sector and private-sector refinery investments in the recent past has led to this recent dramatic increase in India's export ranking. This has been predicated on an investment model adopted by private refiners, who while unable to sell their products in the domestic market, where they compete with NOCs due to strict price controls, seek instead to take advantage of higher refining margins through international sales. Interestingly, we see a new trend emerging, with Indian public sector companies now beginning to divert their surplus capacity towards exports. Small quantities of product exports began in early 2014.

This paper examines aspects of the Indian refined product market, policy implications, and investment capabilities in the context of export capacity and competitiveness by focusing on two issues: (a) the current status of the trend of export growth in refined products from India, and the factors that have contributed to a more than 200 per cent increase of refined product exports over the last seven years; and (b) the ability of Indian refiners, in aggregate, to maintain their export market competitiveness, to sustain export growth over the next decade, and meet the related challenges.

Sino-Russian Oil and Gas Cooperation: Dawning of a New Era

Keun-Wook Paik

The year 2013 witnessed a major upgrade of Sino-Russian oil cooperation. The achievements in the oil sector between Russia and China during Xi Jinping's first year as the new president of China were much bigger than those during the decade of Hu Jintao's presidency (2003–2012). However, the massive crude supply deals between Rosneft and CNPC/SINOPEC during 2013 raised a big question, namely, how Russia would balance the volume of crude supply to China (through Skovorodino) and other Asian consumers (through Kozmino) with the limited production capacity from East Siberia. To answer this question, this paper makes an in-depth analysis of the supply capacity of the production centres in East Siberia for the ESPO (East Siberia–Pacific Ocean) oil pipeline. The supply gap has to be covered by the diversion of West Siberia's crude for Europe to Asia, and the driving force for this diversion of crude supply flow is Beijing's massive financing of this very large-scale crude supply to China.

This paper will explain the importance of the upfront payment that had facilitated the second oil supply deal. In the case of Sino-Russian gas cooperation, by the end of 2013 the gas deal had not materialized.

Despite this failure, both Gazprom and CNPC are strongly indicating their intention to fix the final export price during the spring of 2014, and ultimately President Putin's Beijing visit in May 2014 could seal the long awaited price deal. The result – success or failure – of the Sino-Russian gas price deal will be the most important gas news in 2014 and will have a massive impact on regional and global gas trading in the coming years and decades. It will fundamentally affect the volumes of US and East African LNG heading to Asia towards the end of this decade, not to mention LNG from Australia and Canada. To explain the very complicated gas price negotiation process between the two countries since the failure of the gas price deal during the June 2011 summit in St. Petersburg, this paper will make a chronological analysis of the process before assessing the implications for regional and global gas trading.

An Empirical Analysis of the Fiscal Regime for Exploration in India

Anupama Sen

This paper presents an analysis of the fiscal regime for oil and gas exploration in India from 1999 to 2010, covering the period from the liberalization of the upstream sector to the present. It also addresses the following research question: is there an optimal set of fiscal terms for exploration in India? The motivation for this paper is twofold. First, in developing countries, government perceptions of hydrocarbons within energy have altered significantly in the last decade, and rather than being formulated in isolation, optimal policy towards energy supply has to be considered along with broader goals relating to macroeconomic constraints and climate change mitigation. The production of hydrocarbons is widely seen as being underpinned by the fiscal regime governing exploration. It follows that the design of fiscal terms by governments can be utilized to complement these broader goals. The second motivation relates to the fundamental problem faced by energy-deficit developing countries such as India in designing their fiscal systems, namely, incentivizing firms to invest in exploration and production whilst ensuring a fair (and preferably early) share of revenues to the government. Specifically, India's fiscal regime has faced significant problems in the past, with contracts going to arbitration and the national auditor alleging the loss of large amounts of revenue to the exchequer. Given its growing demand for energy (predicted to triple to 1,500 mtoe by 2030), balance of payments constraints (a current account deficit of 6 per cent), and environmental concerns, the design of a successful fiscal regime for domestic exploration and production will underpin how India deals with its impending energy crisis. The paper uses a meta-modelling approach, which combines cash flow simulations – using real field data from India – into a regression model to identify the impact of fiscal terms under the regime during 1999–2010 on variables representing economic returns to both firms and the government.

Gasoline and Diesel Pricing in BRIC Countries: Key Issues and Prospects for Reform

Carolina Santos de Oliveira, Bassam Fattouh, and Anupama Sen

This paper focuses on the extent to which fuel price movements in international markets are passed on to consumers in the BRIC nations, thereby aiming to identify the pricing processes and their consequences for the downstream sector. Firstly, it briefly presents the history of petroleum product pricing in Brazil, Russia, India, and China (BRIC), arguing that in both India and China the effect of the latest reforms has been to move local prices towards international levels, while in Brazil and Russia, despite officially deregulated prices, the trend is not clear. It then describes the pricing mechanisms applied in these countries and the key policies used by governments to influence local prices. The paper identifies the main entities bearing the losses from pricing gasoline and diesel below market prices, and how the pricing issue is affecting downstream investment. Finally, the paper draws some of the main lessons learnt from the BRIC experience.

Challenges across Brazil's Oil Sector and Prospects for Future Production – published

Virendra Chauhan, Maarten van Mourik, & Pedro Florencio

Less than 10 years ago, at the height of the commodities boom, Brazil was all but assured a place as an oil world powerhouse following the discovery of oil in its subsalt basins. Much faith has been put in Brazil delivering the barrels needed to keep the medium-term oil market in reasonable balance. The IEA, EIA, OPEC, major oil companies, and the Brazilian government have all projected the country's oil production to increase substantially in the coming years. This optimism was brought to the forefront of the global oil and gas industries by the 2007/2008 discovery of the vast pre-salt basins, specifically the Tupi field. This ranks alongside Kashagan as one of the largest and most significant oil discoveries of the past few decades, and

the biggest in the Americas since the Cantarell field in Mexico in 1976. However, as has often been the case in recent history for the oil markets, a number of project delays and cost overruns have since taken the shine off the initial optimism, and has also kept Brazil from playing a bigger role in the non-OPEC supply picture.

What has slowed progress in the Brazilian oil sector? Published in October 2014, this paper argues that Brazil's upstream sector faces a number of key challenges, including: regulatory barriers; a massive financial burden, consisting of the world's largest corporate expenditure programme and increasingly funded by debt; high production costs and high decline rates; caps on domestic fuel prices, which have adversely affected Petrobras' earnings; and waning interest from major international oil companies (IOCs) in co-financing projects. The country's deep-sea bonanza has become less alluring, while oil companies have also been adapting to a changing energy landscape, altered by a focus on capital discipline, shale in the US, and the emergence of other frontier energy sources, such as in deepwater Africa or oil sands in Canada.

Economic Rebalancing in China and Its Implications on China's Energy Consumption

Xin Li

This research project aims to evaluate the energy impact of economic rebalancing strategies in China by using an input-output analysis. It includes a brief introduction of China's economic development and energy situation during the past 30 years. It then reviews the input-output models used in previous energy studies, with a specific focus on China, and sets out a new model to evaluate a range of policy packages which represent alternative pathways of economic rebalancing in China (such as from relying on manufacturing industry to service industry, and from the more advanced coastal areas to the inland areas). This research also highlights the significance of changes in technological coefficients and changes in energy efficiency, which could help explain if China's rising CO₂ emissions are caused by less-advanced technology or high levels of energy use.

OTHER

US NGLs Production and Steam Cracker Substitution: What Will Be the Spillover Effects in Global Petrochemical Markets?

Bassam Fattouh & Craig Brown

The surge in natural gas liquids (NGLs) supply accompanying US shale production has notably underpinned the domestic petrochemicals industry with cheap plant feedstock, particularly in the form of ethane. This has allowed US plants to forge a competitive global position in ethylene production and ushered in a new era of investments in the US petrochemicals sector. However, the impact of US NGLs production is not confined to the domestic petrochemicals sector. The emergence of the US as a key global exporter of light-end commodities and purity products split from NGL streams is not just redrawing traditional trade patterns, it is also influencing wider market dynamics and global petrochemical feedstock trends and investment decisions. In this paper, published in September 2014, we argue that while North American producers will lead the charge on cost-advantaged, ethane-based ethylene production, petrochemicals markets will also adjust to support naphtha-based steam crackers based on growth in condensate exports and splitting capacity, particularly in markets east of Suez. Given these dynamics, the major spillover effect of US NGLs production on global petrochemical markets will be the provision of more optionality and feedstock alternatives between LPG and naphtha to global producers. This will ultimately act as a 'balancing mechanism' in global petrochemical markets outside the US.

Gas

GEOPOLITICS, SECURITY OF SUPPLY, REGULATION

Iran's Natural Gas Industry in the Post-Revolutionary Period – Optimism, Scepticism and Potential

Elham Hassanzadeh

Published in November 2014, this book describes the historical, political, and economic developments which have led to Iran's failure to engage in the international gas trade at a material level, despite its world

class reserves. It includes a description of the development and organization of Iran's gas industry and the challenging environment for IOCs due to legal and political barriers, not least the rigid current investment framework and the US and international sanctions. It also outlines the domestic politics and the resulting dilemmas faced by qualified Iranian authorities, which are striving to achieve successful negotiating positions with external parties while being typically undermined by internal political factions. The book also examines the challenges facing the Iranian government in allocating its vast natural gas resources to competing uses, including the domestic market, oilfield reinjection, and exports. Unless material changes in domestic political attitudes and international relations occur, all these factors – combined with the lack of a long-term, transparent policy – serve to lower the probability of Iran becoming a major gas exporter in the short to medium run.

The Russian Gas Matrix: How Markets Are Driving Change

James Henderson, Simon Pirani (ed.)

This book explores the key issues facing the Russian gas sector in a more competitive global gas market and assesses how the Russian responses to these issues will in turn impact the markets where Russian gas is sold. The structure of the book reflects OIES thinking on the Russian Gas Matrix, and it includes chapters on demand for Russian gas in Europe, the CIS, Asia, and the domestic Russian market, as well as an analysis of sources of Russian gas supply, including Gazprom, independent producers such as Novatek and Rosneft, and imports from Central Asia. The book also addresses the key political and economic issues concerning the gas sector, including the impact of gas revenues and taxes on the Russian budget, the potential for the structure of the domestic market and the export monopoly to change, the future of domestic gas prices, and the balance of supply among Russian producers. Published by Oxford University Press in May 2014, this book provides a detailed update to Stern's 2005 work entitled *The Future of Russian Gas and Gazprom*. Contributors to this book are: James Henderson, Tatiana Mitrova, Simon Pirani, Jonathan Stern, and Katja Yafimava.

The Role of Gas in UK Energy Policy

Chris LeFevre

Natural gas has often appeared to be a 'balancing factor' in UK government energy policy. Given a long-term vision of carbon-free energy, the main focus of government has been on developing an electricity sector that will provide power through nuclear/renewable sources with gas expected to fill in the gaps as required. On the other hand, unlike the electricity sector, the UK gas market has remained relatively free of direct government intervention, and whilst demand for gas has not grown in line with some expectations, it is still a vital part of the nation's energy mix. However, there are signs that the policy environment may be starting to change. Concerns from both politicians and (to a greater or lesser degree) the public have emerged in a number of areas.

The background described raises not only issues related to policy actions in the gas sector, but also more fundamental questions regarding the prevailing consensus on energy market structures and conduct. The paper seeks to answer the following questions. How far has the consensus regarding the legitimacy of a privatized, market-led energy market eroded in the face of public concerns over costs and supply security? How might policy evolve given these concerns and government intervention to reduce carbon emissions? What role is gas likely to play in this future environment and what might be the impact of other factors such as indigenous shale gas or abundant international supplies? Is there a case for specific policy initiatives directed at the gas market?

The New German Energy Policy – What Role for Gas in a De-carbonization Policy?

Ralf Dickel

German Energy policy – in its current form the *Energiewende* – is the product of a complex evolution of overt aspirations of many of the parties in and out of governing coalitions since the turn of the century, and a covert fear of import dependency on Russian gas combined with 'coal-mindedness' – an affinity for the use of coal and lignite, despite the country's net coal import position.

In this extensive and comprehensive paper, published in March 2014, Ralf Dickel explains the political path by which Germany's current energy policy was derived and in particular the way in which the Fukushima disaster on March 2011 finally catalysed an embedded desire to exit nuclear energy in many political factions to fulfilment through consensual legislation. Phased nuclear closure and a desire to achieve decarbonisation targets drove the many scenarios underpinning energy policy, but the role of

gas was never explicitly addressed within the governing political mainstream. The choice between gas and coal/lignite was comprehensively 'ducked' but as the abject failure of the ETS system unfolded it was convenient to ascribe such a choice as being 'for the market to decide'. At present a CO₂ price of €50/tonne CO₂ would be required to burn gas in favour of coal in German power plant.

Looking ahead however, the paper anticipates potential developments for which the maintenance of the German gas sector and its transmission grid would be much more positive (preserving options) than allowing gas to wither and coal and lignite to maintain dominance. These include the continuation of biogas generation, gas with CCS (having superior investment economics than coal and lignite) and power to gas, via the Sabatier process, by which surplus renewable power generation could be stored as (zero carbon) gas and utilised by the existing transmission and storage system.

Reducing Dependence on Russian Gas: Distinguishing Natural Gas Security from Geopolitics

Jonathan Stern, Katja Yafimava, Howard Rogers, Simon Pirani, Laura El-Katiri, Anouk Honoré, James Henderson, Elham Hassanzadeh, and Ralf Dickel

The main finding of this paper, published in October 2014, is that there is limited scope for significantly reducing *overall* European dependence on Russian gas before the mid-2020s. However, countries in the Baltic region and South-East Europe, which are highly dependent on Russian gas and hence extremely vulnerable to interruptions, could substantially reduce and even eliminate imports of Russian gas by the early 2020s by a combination of LNG supplies and pipeline gas from Azerbaijan. Similar measures could reduce (but not eliminate) the dependence of Central Europe and Turkey on Russian gas. In the majority of countries, there is limited scope to reduce gas usage by using oil products, and to the extent that it is replaced by coal in power generation, carbon emissions will increase significantly.

Up to the mid-2020s, European companies are contractually obliged to import at least 115 Bcm/year of Russian gas (approximately 75 per cent of the 2013 import level), a figure which reduces to around 65 Bcm by 2030. Even if long-term contracts disappear, our modelling shows a requirement of at least 100 Bcm/year of Russian gas up to 2030, and in some scenarios up to twice that volume. The main additional source of non-Russian gas for Europe up to 2030 will be LNG, as pipeline gas imports from domestic and other imported sources are not envisaged to increase substantially and may even decline. Russian gas deliveries to Europe will be highly competitive with all other pipeline gas and LNG (including US LNG) supplies throughout the period to 2030, and Gazprom's market power to impact European hub prices may be considerable.

Countries with strong geopolitical fears related to Russian gas dependence will need to terminate, or not renew on expiry, their long-term contracts with Gazprom. This will result in substantial additional infrastructure costs for LNG import terminals and pipeline connections, or investments in alternative energy sources, energy conservation, and efficiency measures.

Whatever the political relationship between Russia, the European Union, and individual European countries, a continued natural gas relationship will be necessary and need to be carefully managed. The most immediate problems are a resolution of the Ukrainian transit situation and a successful conclusion of the EU's regulatory treatment of the South Stream pipeline. Once the immediate crisis has passed, both sides need to discuss the future role of gas in EU energy balances, together with its potential contribution to the EU's ambitious carbon reduction targets.

The Mexican Gas Sector – Is Import Substitution a Rational Economic Aim?

James Henderson

Demand for gas in Mexico currently exceeds supply by a factor of two to one, leading to significant imports of expensive LNG. The recent announcement of liberalization in the upstream sector, and the opportunity for increased foreign investment in the Mexican oil and gas sectors, suggests that domestic gas supply could increase as new onshore and offshore areas are opened for investment. The shale areas in the north-east of the country, bordering the US state of Texas, appear particularly good prospects, as they lie on trend with the gas-producing Eagle Ford area across the border. However, it remains unclear whether the costs of developing gas resources in the country actually justify the end of reducing imports, as LNG can increasingly be replaced

with rising imports of shale gas via pipeline from the US – the price of which is based on the Henry Hub benchmark. At present, the low price of US gas would appear to make the construction of more pipeline import capacity a more viable option than the development of Mexican resources. This study will examine the potential of the upstream gas sector in Mexico, discuss the outlook (short, medium, and long term) relative to the country's import options, and consider the midstream and downstream issues that will need to be resolved if the country's growing demand is to be met. The ultimate goal of the paper will be to assess the optimal balance of imports and domestic supply that can provide the best economic outcome for the country.

Building New Gas Transportation Infrastructure in the EU: What Are the 'Rules of the Game'?

Katja Yafimava

This paper will address the issue of construction and usage of incremental and new gas transportation capacity in the EU. It will analyze the existing (Guidelines of Good Practice for Open Seasons, the Energy Infrastructure Package, the 3rd Gas Directive) and draft (ACER Guidance for incremental capacity) regulation, as well as various proposals for development of additional regulation (Coordinated Open Seasons, for example), with the aim of establishing whether the existing/draft/proposed regulatory framework is adequate for construction of new cross-border pipelines in the EU. The lack of an adequate regulatory framework for incremental/new capacity development would discourage the building of new capacity that might be necessary for overcoming physical bottlenecks in the EU and for bringing gas from outside the bloc. This will be the second paper in the series of gas programme publications on EU regulatory issues.

Evolution of Gas Pipeline Regulation in Russia – Third Party Access, Capacity Allocation and Transportation Tariffs

Katja Yafimava

Russia has been reforming its domestic gas transportation regime since the mid-2000s, and it achieved significant progress through an introduction of legal unbundling, establishment of a legal/regulatory framework for non-discriminatory access, and a new zonal tariff methodology. However the existing framework remains insufficiently developed both in scope and content; the new draft framework, currently under discussion in government, aims to address these problems. From the Russian state's point of view, the aim of domestic gas market reform – including the reform of the gas transportation regime – is to establish a level playing field for Gazprom and non-Gazprom parties in order to ensure the optimal development of the domestic gas sector and the Russian economy as a whole, while preserving the country's competitive position as an exporter to both European and Asian gas markets. This paper argues that this aim is (at present) to be achieved by increasing direct government involvement and strengthened FTS (Federal Tariff Service) and FAS (Federal Antimonopoly Service) oversight. However, should these measures fail, then more radical measures might be required, such as abolition of the UGS system indivisibility principle, with subsequent Gazprom ownership unbundling and the state becoming the owner of both the UGS and non-UGS networks.

PRICING EVOLUTION

European Gas Hubs Development

Patrick Heather

In 2012, Patrick Heather's paper 'Continental European Gas Hubs: Are They Fit for Purpose?' provided very positive conclusions for the hubs of North-West Europe, with uncertainty as to whether the Italian hub would reach a sufficient level of maturity. This paper will provide an update on developments since 2012, with the scope expanded to include the situation in Iberia, South and South-East Europe, and Turkey where bilateral trading activity could develop in time to establish sufficient activity to provide a valid price reference. In addition to some level of quantitative comparison, the paper will also describe the critical 'cultural' support offered in support of hub development by regulators, system operators, and key commercial players.

European Gas Hubs Price Correlation: Barriers to Convergence?

Beatrice Petrovich

With survey data from the IGU and other organizations continuing to demonstrate the ongoing widespread adoption of hub pricing for European gas, and trading volumes growing strongly overall, this paper revisits the issue of hub price correlation. Following from the ground-breaking paper of October 2013, where for the first time in the public domain the analysis of OTC trading data revealed strong trends towards price convergence at the European gas trading hubs, Beatrice Petrovich extends the analysis with data to October 2013.

Focusing on price and volatility correlations between Europe's gas trading hubs, Beatrice identifies those whose trends, either temporarily or on a more sustained basis, are out of line with the 'core group' of continental hubs in the north-west. Applying a forensic focus, the underlying causes of such anomalies are, where possible, identified. This involved extensive discussions with system operators and market participants, as well as analysis of infrastructure flow data.

The emerging picture is a positive one in terms of supporting the thesis that European gas hub prices respond to supply and demand forces. However, as flow patterns across Europe change, for example due to LNG being diverted away from Europe towards Asia and with the opening of North Stream, new 'pinch points' or bottlenecks emerge, which can cause hub prices to de-link. Whether, in a European context, the appropriate incentives are in place to resolve such bottlenecks in a cost-effective manner is beyond the scope of this paper. It may be worth reflecting, however, that despite being a liberalized gas market since the 1980s, the US still has need to reconfigure and debottleneck its gas transmission system as its geographic loci of demand and supply continue to change and evolve.

The Development of Chinese Gas Pricing – Drivers, Challenges and Implications for Demand

Michael Xiaobao Chen

This paper describes, within the context of China's continued rapid gas sector development, the evolution and current status of Chinese gas price reform, which establishes city gate benchmark prices, most notably at Shanghai. These provide the basis on which sectoral prices are determined for consumption and wellhead prices in the various producing regions. The paper, published in July 2014, also discusses the likely future path of pricing evolution and identifies the likely response of different demand sectors in various regions within China, both to price levels and supply availability.

Vector Auto Regressive Analysis on Gas Hubs as Multi Agent System

Sybren de Jong

As addressed in several gas programme papers, European gas hubs have become the dominant price reference points for North and Central Europe. On the basis of liquidity measures and correlation metrics, the UK's NBP and the Netherlands' TTF are the leading gas hubs in the European market, whilst those in Germany, France, Italy, and Austria are closely linked through arbitrage. Traders on a trading floor make use of information of several adjacent gas hubs before making their decision about a gas deal or about bid and offer prices. From this, one may expect that gas prices are well correlated with a possible time lag in the variation of the price signals of each of the gas hubs. This time lag contains information about the relative position of each of the gas hubs. This paper addresses the question of which hub is the 'prime mover' and which hubs follow.

SUPPLY DEVELOPMENTS

Natural Gas in Canada – What Are the Options Going Forward?

Ieda Gomes

With US shale gas dominating the headlines of the energy media for the past several years, Canadian gas has been somewhat overshadowed. While gas industry followers outside North America may have been aware of the reduction in Canadian gas exports to the US, they will likely have missed the complex interaction of lower-cost US shale invading regional Canadian markets that were formerly domestically supplied. This situation

has been further exacerbated as Canadian transportation tariffs have been raised to compensate for lower throughput. In this research Ieda Gomes provides a comprehensive analysis of the dynamics of these and other key elements of Canada's gas fundamentals and how they have evolved and will continue to evolve.

The Outlook for Russian Exports to Asia – Pipelines and LNG

James Henderson

LNG has been a priority for Gazprom for the past decade as it has attempted to establish itself as a global player in the gas market, but it is now becoming an area of increasing competition with its domestic rivals. 2014 also saw the conclusion of an agreement for exports of 38 Bcma of East Siberian pipeline gas to North-East China, with indications that an agreement for an additional 30 Bcma from West Siberia to North-West China could follow shortly. This report will examine how Russia's overall export strategy for Asia is developing, who the key players will be, and whether the country's projects can be competitive in the global gas market.

The Future of Australian LNG Exports

David Ledesma, James Henderson, & Nyrie Palmer

Australia is expected to overtake Qatar as the world's largest supplier of LNG by the end of the decade, with existing facilities soon to be augmented by seven new LNG projects, which are due for completion in the 2014–2018 timeframe. With its plentiful gas reserves, prior track record of LNG project execution and operation, and relative proximity to the fast growing Asian LNG markets, the degree of comparative advantage would seem to guarantee a benign investment environment.

However, several factors have resulted in significant cost escalations and in some cases delays, including competition for skilled labour within Australia, the strength of the Australian dollar, and the specific logistical and environmental sensitivities of the project locations. This paper (published September 2014) also serves to convey an understanding of the much overlooked Australian gas market and, significantly, the impact that the new LNG projects are already having on internal supply and demand, price dynamics, and the political challenges raised.

The Outlook for Azerbaijani Gas Supplies to Europe: Challenges and Perspectives

Gulmira Rzayeva

As the birthplace of the oil and gas industry, Azerbaijan's long and rich history is intertwined with hydrocarbon production, with Azeri oil drilling pre-dating activity in Pennsylvania by 13 years. The involvement of foreign oil companies in the late 1800s, including the Nobel Brothers, resulted in the country becoming the world's foremost oil producer at the turn of that century. The Soviet era precluded further international investment and saw the initial collapse but then a sustained growth in oil production and a dramatic growth in gas production commencing in the 1920s. Azerbaijan became a highly gassified economy with gas trade flows with Iran and Russia. The 1990s witnessed the return of the IOCs, with the Azeri-Chirag-Guneshli field (oil and associated gas) and the Shah Deniz (gas and condensate) field developments reversing the trend of production decline and creating an export surplus in both oil and gas. This paper provides a comprehensive analysis of the challenges which were surmounted in the development of the Shah Deniz field, not least of which related to establishing export pipelines and marketing arrangements in Turkey and (for Phase 2) Europe. The paper also details the nature and estimated potential of partially developed fields, discoveries at varying stages of appraisal, and prospective structures in the Azerbaijani sector of the Caspian Sea, and provides a comprehensive insight into the main drivers and the future dynamics of this important future gas supply source for the wider European region.

Natural Gas in the Turkish Domestic Energy Market – Policies and Challenges

Gulmira Rzayeva

Over the past 10 years or so Turkey has featured prominently in the various schemes to open a 'fourth corridor' of gas supply to the core European national gas markets. The grandeur of earlier visions has morphed into a pragmatic and initially more modest scheme to supply 10 Bcm/yr of gas beyond Turkey. With the Euro-centric political excitement around 'Nabucco' on the wane the importance of the Turkish gas market in its own right has been overlooked.

In the post financial crisis period it should be noted that Turkey is the only significant European regional gas market to have shown strong growth post 2009 and its 45 Bcm consumption in 2012 places it on a par with France. With domestic production contributing only 2% of its requirements Turkey imports pipeline gas from Russia, Azerbaijan and Iran and LNG from a number of supplier countries. Its likely continued rapid gas demand growth raises challenges not only of project logistics and timings but also, given its geographic location, those of a geopolitical dimension. In addition to its long held aspiration to become a regional gas transit 'bridge' between Central Asia, Iran and Iraq and Europe, Turkey is also in the process of liberalizing its gas market, with mixed success to date. This paper was published in February 2014

The US Shale Gas Revolution and Its Impact on Qatar's Position in Gas Markets

Bassam Fattouh, Howard Rogers, and Peter Stewart

The US shale gas revolution has unleashed some powerful forces in energy markets, and there is a widespread belief among many market analysts that such transformations on the global energy scene will undermine Qatar's position in global LNG markets. This paper's main objectives are: to analyze the impact of the US shale gas revolution on Qatar's position in global gas markets; to evaluate some of the potential strategies that Qatar could pursue in light of the US shale revolution; and then assess the implications of such strategies on global gas markets and gas prices, including the price formation mechanisms and the prospects for an Asian LNG trading hub.

The Outlook for Floating LNG Liquefaction Solutions

Brian Songhurst

The FLNG concept has brought new players into the liquefaction market with an entrepreneurial approach in providing an own-and-operate service (as they do for floating regas) on a leased basis. This is ideal for the small independents who would otherwise struggle to raise the capital, thus providing an enabling technology for marginal fields. It could also provide a lower production cost base for the major energy companies and possible reuse, especially given: a) concern over the rising cost of liquefaction projects in general and in certain locations specifically; and b) the potentially more highly competitive market that new projects may face over the next 10 years, and the consequent need to ensure projects which are robust at lower expected market prices. The fundamental attraction is the prospect of repeat 'standardized' units built competitively in a shipyard, rather than bespoke, customized land-based liquefaction solutions. The paper will assess: the capabilities and track record of the likely FLNG solution providers; the limitations to this approach in terms of condensate yield, gas impurities, and water depth; an indicative cost comparison with the 'status quo'; an assessment of the scope for deployment on otherwise stranded marginal fields; and other issues such as host government requirements for local project content.

DEMAND DEVELOPMENTS AND MARKETS

Brazil: Country of the Future or Has Its Time Come for Natural Gas?

Ieda Gomes

In recent years, Brazil has received much attention in macro-economic circles as one of the high growth BRICS countries. Its performance has waned of late, apparently due to lack of internal reforms and infrastructure bottlenecks, and, as this paper demonstrates, these factors certainly 'read across' to Brazil's natural gas sector. Initial excitement in the wake of Brazil's offshore pre-salt hydrocarbon discoveries in 2007 and 2008 raised the prospect of Brazil becoming an LNG exporter. This prospect has receded following further appraisal and market developments, and managing the country's gas balance has been further complicated by low rainfall (and hence hydro availability) in recent years. For these reasons, Brazil has had to import LNG at Asian-equivalent spot prices to meet requirements which are difficult to forecast.

In short, given its scale, growth potential, and its impact on the global LNG market, Brazil is a market which any observer of the natural gas world is required to develop a working understanding of. However, its circumstances and specificities make such an understanding extremely difficult. This paper, published in July 2014, offers a comprehensive, lucid, and perceptive assessment of the evolution, status, and future challenges of Brazil's gas sector.

The Netherlands Natural Gas Market

Anouk Honoré

The discovery of the giant Groningen onshore gas field in 1959 is generally acknowledged to represent the birth of the European natural gas industry. In addition to meeting the majority of the Netherlands' domestic gas requirements, it has also played a key role in providing base supply and winter 'swing' flexibility to neighbouring markets in North-West Europe. As natural gas consumption increased, the Netherlands' geographic position enabled it to adopt the role of a 'gas roundabout': importing gas from Russia and Norway, some of which transited through to adjacent markets. Field maturity, inevitable production decline, and the occurrence of earth tremors coinciding with high production periods are also placing restrictions on the Netherlands' gas production. In addition to describing the development of this market, the paper will address the issue of whether the 'Dutch disease' was more fiction than fact, the outlook for Dutch gas consumption, and the remarkable success the country has had in creating the Title Transfer Facility (TTF), which has rapidly emerged as continental Europe's pre-eminent gas trading hub.

Natural Gas Markets in Latin America and Interactions With the Rest of the World

Anouk Honoré

This paper looks at pricing in the growing Latin American natural gas market, starting with a brief review of the gas sector, including regional pipelines, LNG terminals, and gas flows. The key issues will be historical step-changes and how gas is currently priced regionally. The paper will then turn to national markets and briefly analyze the development of the gas industry, with a focus on developments in the 2000s and what changes might be expected by 2020. The key gas pricing issues are linked to: domestic and regional upstream gas availability; development of regional gas pipeline interconnections and politics; growing demand and shortage of supply (depending on location, costs, technology, mature fields, political decisions, etc.); use of gas as a back-up for hydro; and the role of LNG and how it can open up the region to new sources of gas supply.

The Outlook for Natural Gas Demand in Europe

Anouk Honoré

This paper concludes that European gas demand will not recover its 2010 level until about 2025. The scenarios show that natural gas demand in the 35 countries of the European region falls from 594 Bcm in 2010 to 564 Bcm in 2020 and then rises to 618 Bcm in 2030. Only 24 Bcm in two decades may seem very pessimistic, but one must not forget the sharp decline that already happened 2010–2013. Focusing on the 2013–2030 period, 88 Bcm of additional gas consumption is expected.

Even before the financial crisis of 2008 and subsequent recession, European demand growth had slowed. This was a product of a maturing market, low population growth, higher gas prices (in large part due to the oil price linkage in much of its contracted imports), and the migration of manufacturing industry to other world regions. Assessing the long-term prospects for European gas demand against this backdrop would be challenge enough, but the challenge is taken into formidable territory, especially in the currently uncertain post-crisis economic landscape, by the additional dimensions of: EU renewables and decarbonization policy, the Large Combustion Plant Directive, the Industrial Emissions Directive, the German *Energiewende* and other country-specific policies, and diverse national power generation mix 'starting points'. This paper, published in June 2014, addresses all the major 'known unknowns', as far as this is possible, and proposes an overview of the gas demand fundamentals in Europe to the 2020 and 2030 horizons. Readers will find in the appendix all the key assumptions set out in detail at a national level which, when aggregated, form the basis for the demand outlook scenario.

Russian Power and District Heating Demand

Simon Pirani

As Russian domestic gas prices have increased in line with regulatory policy, it was to be anticipated that efficiency responses through new plant investment would serve to moderate demand. To date, however, these effects have been difficult to quantify due to issues of data availability and quality. In this paper, Simon Pirani will attempt to overcome such challenges and identify the demand-side dynamics in a market where increased competition between supply-side players is creating the beginnings of a gas bubble.

The Prospects for Natural Gas as a Transportation Fuel in Europe

Chris N Le Fevre

In the wake of the recession resulting from the financial crisis of 2008, European demand for natural gas is essentially stagnant and has recently lost market share to coal and renewables in the power generation sector in various European national markets. This factor, as well as the significant price differential between natural gas and oil products since 2008, has created renewed interest in the market for natural gas in transport.

Gas in transport is neither new nor revolutionary. An assessment of gas' prospects in this sector relates to its ability to displace other fuels (existing and new alternatives). An additional complication is the need to consider transportation sub-sectors, namely: light duty road transport, public passenger road transport, freight and goods vehicles and marine and inland waterway shipping.

In this comprehensive paper Chris Le Fevre draws on extensive research and discussion with interested bodies to address the case for natural gas in transport, the extent and likelihood of its adoption, the long term implications for additional European gas demand and the key policy drivers and structural challenges which would encourage or inhibit these developments.

Gas Pricing Reform in India – Implications for the Indian Gas Landscape

Anupama Sen

This paper analyzes whether or not recent reforms to the pricing of domestic gas could potentially change the Indian gas landscape by making price signals clearer. It investigates three important questions. First, could gas pricing reforms reverse the recent decline in domestic production? Second, could they lead to new upstream investments in gas? Finally, what is the impact of the reforms on downstream consuming sectors? The paper begins with an analysis of the 2014 gas pricing reform, followed by an overview of demand, supply, and consumption. It then delves into the three broad questions posed above, and concludes with observations on whether reforms to gas 'price formation' (as opposed to 'price level') in India are in fact achievable, and on whether India can ever be Asia's next gas market 'Goliath'.

The Dynamics of a Liberalised European Gas Market: Key Determinants of Hub Prices, and Roles and Risks of Major Players

Jonathan Stern and Howard Rogers

Hub pricing is dominant in North-West Europe's gas markets and is spreading to the south and east of the continent. This paper, published in December 2014, finds that the most important determinants of European hub prices will be global gas market dynamics. Changes in these dynamics will create price competition between LNG from a variety of sources (including North America) and Russian pipeline gas in Europe. Changes in prices and contracts in the new competitive environment of European gas markets have had significant impacts on the roles and risks of the major groups of European gas market players. Midstream energy trading companies have encountered the biggest problems because liberalisation, competition, and the move to hub prices have rendered their traditional business model (at least partially) unworkable. Should a successful response to these problems prove impossible, companies are likely to exit the natural gas sector, with significant impacts on security of supply and an increased likelihood that many existing long term contracts will be unable to survive into the 2020s.

ELECTRICITY/CLIMATE CHANGE/SUSTAINABILITY

Implications of Decarbonization for Electricity Demand

Malcolm Keay

The focus of electricity decarbonization to date has largely been on the supply side – substituting low-carbon sources like renewables and nuclear for conventional generation. However, the implications for the electricity demand side are equally fundamental. It is not just that new pricing and metering systems will be needed – the customer will also need to become a smart and active player in electricity markets, and developments on supply and demand sides will need to be approached in an integrated fashion. Electricity markets in particular, which

provide the link between supply and demand, will need fundamental reform. This research will look at the need for a new conceptual approach to the supply of electricity, the implications of such a reconceptualization, and how it might be realized in practice through a fundamental redesign of electricity markets.

UK and EU Wholesale Electricity Markets

Malcolm Keay

Very large amounts of investment in low-carbon generation (such as nuclear and renewable power) will be needed to meet UK and EU carbon targets. It is not clear whether this investment will be forthcoming without substantial wholesale market reform, the like of which is under way in the UK and a number of European markets. In this research, the proposals as they have developed are analyzed and their strengths and weaknesses considered, along with the implications of national electricity market reforms for the single electricity market in Europe, and the question of whether the European Target Model market is fit for purpose.

A Critical Review of China's Wind Power Development

Xin Li

In recent years, wind power has outpaced all other renewable energy sources in terms of generation capacity growth in China, except for hydropower. Total installed capacity of wind power experienced a steady increase from 381.2 MW in 2001 to 1,249.5 MW in 2005. Between 2006 and 2010, wind power generation almost doubled every year. With 53,764 wind turbines installed, total wind power generation capacity had reached 75,324 MW by the end of 2012. The National Development and Reform Commission, together with the International Energy Agency (IEA), proposed a wind energy roadmap in China running up to 2050. According to the projection, wind power generation capacity could reach 200 GW and 1,000 GW by 2020 and 2050, respectively. Such capacity growth is exciting but not convincing, however. A significant proportion of wind-powered output is curtailed due to insufficient power grid infrastructure and infeasible back-up systems. In addition, the institutional settings of China's power system have impeded the development of wind energy in China.

The aim of this research is to provide a critical review of wind power development in China based on the existing literature. It starts with an overview of China's power generation system in terms of generation capacity growth, power mix, and future projections. A portrait of the development of China's wind power at both national and regional levels (from the early 1990s to the present day) is then presented. It is followed by an introduction to the potential of Chinese wind power and the development of domestic wind turbine manufacturing. This paper ends by discussing the barriers to wind power development in China.

US Climate Change Policy and the Power Sector

David Robinson

On 2 June 2014, the US Environmental Protection Agency (EPA) published its proposed performance standards to reduce CO₂ emissions from existing power stations. In 2012, these stations accounted for about 38.5 per cent of US energy-related CO₂ emissions, chiefly from coal. To date, the EPA proposal is the most substantial federal policy initiative aimed at reducing CO₂ emissions in the US. However, other developments will also influence CO₂ emissions from the power sector. This paper, published in June 2014, places the proposed EPA regulations into their wider political and sectorial context. It analyzes four determinants of the demand for coal and gas in the power sector, as well as the resulting CO₂ emissions: the relative price of coal and natural gas; electricity demand; renewable power; and EPA regulations.

There are four messages. First, reductions in CO₂ emissions from the US power sector are likely to be modest, at least from a European perspective. Coal and natural gas will together continue to provide over 60 per cent of US electricity until at least 2030. Second, achieving EPA objectives for CO₂ emissions reduction will be difficult, which partly explains why the targets are modest. There are barriers to reducing coal-based generation in the US, including the relatively low cost of coal and strong political support for coal in many states. Third, while the market share for natural gas will grow, its market in the power sector will be limited by rising natural gas prices, growth of renewables, and flat or declining electricity demand. Finally, absence of bipartisan support for federal action to tackle climate change raises doubts about the successful implementation of EPA regulations and weakens US credibility in global climate negotiations.

Divergent Paths to a Common Goal? An Overview of Challenges to Electricity Sector Reform in Developing Versus Developed Countries

Anupama Sen

Recent experiences in electricity market reform have reignited an enduring debate in economics and public policy: the benefits of liberalized markets versus central planning in the provision of goods and services. This debate as it relates to energy is not new – there has been previous criticism of whether liberalized markets in the energy sector have delivered optimal outcomes on objectives related to pricing, investment, storage, and overall ‘security of supply’ (Wright, 2006; Rutledge and Wright, 2010). However, the debate has arguably taken on new and greater relevance for two reasons. The first relates to the role of the electricity sector in decarbonization, and the argument that the sector provides the most direct and substantial way of reducing greenhouse gas emissions given the growing urgency of the environmental impacts of non-action (Keay, 2009; 2010). The second has wider ranging, global implications, given that many developing countries – which stand to lose the most from the environmental impacts of climate change – have been progressively moving towards electricity market liberalization since the 1990s, after having adopted variations of this model following its relatively successful reception in the developed world at the time. What then are the implications of the fact that developed and developing countries could end up moving in opposite policy directions – the former towards central planning and the latter towards markets – in the pursuit of a shared eventual goal, that is, climate change mitigation through the proliferation of renewable energy in the electricity sector? This paper, published in May 2014, summarizes this debate and sketches out areas of policy relevance as they pertain to developing countries.

Fuel Competition in Generation in India’s Electricity Sector

Anupama Sen and Malcolm Keay

This research analyzes the competition between various fuels (primarily coal, natural gas, and petroleum) used for electricity generation in India by estimating the elasticity of substitution among them. This research can be viewed in two parts. The first looks at the numbers on the relative elasticities of fuel substitution in generation for India’s electricity sector and compares them with developed nations such as the USA, using existing literature. It draws on a method developed by the US Energy Information Administration which applies a linear logit model to US data. The second part considers the policy implications of these results for India by relating them to recent reforms on the pricing of natural gas and petroleum products, to electricity sector reforms, and to initiatives on decarbonization.

Reforming Electricity Reforms? – Empirical Evidence From Asian Economies

Rabindra Nepal, Anupama Sen, and Tooraj Jamasb

The region of South Asia accounts for 1.5 billion people, or 25 per cent of the world’s population, but just under 5 per cent of its electricity consumption, and one of the lowest per capita electricity consumption rates in the world. This region is home to some of the world’s fastest growing developing economies – such as India, Bangladesh, and Pakistan – as well as the world’s largest population of people living in poverty, with very little or no access to any form of modern commercial energy. Beginning in the 1990s, most South Asian economies adopted electricity sector reform programmes aimed at restructuring their power utilities, strengthening transmission infrastructure, and enabling greater access to electricity. These reform programmes were predicated on the textbook (or prescriptive) model of electricity market liberalization pioneered by the UK, and were often adopted as a condition of multilateral agency financing.

The ‘Scissors Effect’ in the EU Electricity Utility Sector

David Robinson

In the last few years, it has become apparent that EU electricity utilities are in serious economic trouble. By utilities, I refer to the companies that have traditionally operated vertically integrated electricity (generation, network, retail) businesses in the EU. Over a hundred billion euros has been wiped off their market value in recent years. This research paper explores the reasons for this and distinguishes between temporary and structural problems.

First, some of the financial problems facing the utilities are related to specific national government policies, notably the decision to close nuclear plants in Germany. This reflects a structural problem in the EU, namely, that national governments have the power to decide the mix of generation and that they intervene frequently and sometimes in a retroactive way. Second, low wholesale electricity prices and the reduction in gas-fired generation are the result of temporary and structural factors. Temporary factors include excess generation capacity, the economic recession, low CO₂ emission prices, and low coal prices. Structural factors include the consequences of subsidizing significant amounts of renewable energy through 'out of market' payments. These displace conventional power stations in the merit order while driving down wholesale market prices. Third, while wholesale electricity market prices have been falling, final consumer prices for electricity have been rising, in large part to recover the costs of political decisions related to climate policy, energy security, and other government priorities.

The utilities are being squeezed by a scissors effect, to a large extent by political interventions but also by temporary market effects. On the one hand, wholesale market prices are being driven down, reducing conventional generation and utility revenues in the wholesale market. On the other hand, retail prices are being driven up, but the increased retail prices fund companies who provide services outside of the market. Furthermore, the higher prices to final consumers reduce demand for electricity from the system (and from utilities), both by encouraging conservation and by encouraging self-generation, which involves bypassing the system altogether. I conclude that the utilities face a structural problem that requires rethinking both of public policy and corporate strategy.

Coal

China's Coal Market: Can Beijing Tame 'King Coal'?

Sylvie Cornot-Gandolphe

Since 2009, China has turned from a net coal exporter to a net importer, and by a large margin; in 2013, the country accounted for almost a quarter of global steam coal imports. This shift has had a tremendous impact on the global coal trade and prices. China became a price setter for steam coal after overtaking Japan in 2009 as the world's biggest importer, while increasing imports have exacerbated oversupply on the domestic market and led to a dramatic fall in coal prices and revenues of coal miners. The government is determined to improve the health of the coal industry while at the same time combatting air pollution from coal mining, transport, and combustion. The new policy measures adopted since September 2013 – such as the Airborne Pollution Prevention and Control Action Plan, the mandated reduction in coal production and imports, and the ban on low-grade coal imports and sales – have a significant impact on the level of coal supply and demand. Market and policy developments in the short, medium, and long term, however, have different impacts on the international steam coal trade.

This paper, published in December 2014, analyzes key policy and market developments in the Chinese coal market and their possible impact on the global coal trade. It reviews recent policy changes that aim to curb China's coal demand and reduce the environmental footprint of coal. The report puts a special emphasis on Chinese coal imports and competition between domestic and imported coal. It assesses the impact of the measures adopted recently by the government on global trade in the short, medium, and long term.

US Coal Exports – The Long Road to Asian Markets

Sylvie Cornot-Gandolphe

The future level of US coal exports is strongly linked to the level of international prices and the building of new export capacities on the West Coast enabling the country to remain competitive on the Asian coal markets. This paper looks at the current and future evolution of US coal exports, reviews the recent surge in coal exports to Europe and Asia, and analyzes the future of coal exports to Asia. Projects to build new coal terminals on the West Coast are also reviewed, and environmental and market challenges are also discussed to assess the likelihood of increased exports from the area.

Journal and Website

Oxford Energy Forum

The institute's quarterly journal, now in its 25th year, continues to tackle topical issues facing the energy world. Issues covered in 2014 included: developments in China's energy scene, future energy challenges for the GCC region, energy in Russia, and the energy landscape in Latin America. Our thanks go to the authors of all articles that appeared in OEF in 2014, to the editor, Bassam Fattouh, and to our guest editors.

Website – www.oxfordenergy.org

The website contains full information on OIES publications, research in progress, and dedicated sections for the OIES Natural Gas Research Programme, Oil and the Middle East Programme, and Electricity Programme. The site also has information on the research interests of our staff, many of whom provide assessments of important energy events for the website's Energy Comments section.

The catalogue of papers and comment pieces on the OIES website continued to grow during 2014. The site now holds more than 230 papers and over 220 Energy Comments, all of which are freely available to download. Downloads of OIES publications reached 124,000 in 2014, an increase of over 28,000 on 2013.

There are now over 2,500 subscribers to the institute's publication notification email service, an increase of 27 per cent on the previous year. Visitor numbers to the website topped 99,000 in 2014, an increase of over 30,000 on the year before, and total traffic to the site was close to half a million visits, drawn from all but seven countries of the world.

Lectures and Seminars

As part of its commitment to education and its mandate to promote scholarly cooperation between energy producers and consumers, the OIES strives to disseminate the results of its research as widely, and in as many ways, as possible. Lectures and seminars enable the institute's researchers to present the findings of completed projects and to expose work in progress to the criticism of colleagues in industry, government, and academia. In 2014, the institute's research fellows, director, and programme directors gave numerous presentations and talks at many conferences, workshops, seminars, and meetings across the globe.

Seminars

The OIES hosted 21 seminars during 2014 on a wide range of subjects, including the future of LNG in Australia, the impact of the Arab Spring on MENA oil and gas supplies, and eight principles for managing oil wealth. The seminars, which are open to all and advertised on the University of Oxford's energy website, included presentations from invited speakers and also from OIES research fellows on their work in progress. Our thanks to all speakers in 2014.

XXV Annual Brainstorming Meeting

Since 1990, the institute has been holding an annual 'Brainstorming Meeting', which draws together people from producing and consuming countries, national and private oil companies, governments, financial institutes, and other research organizations. The 25th such meeting was held 12–13 June in Stockholm, Sweden with the kind support of the Swedish Energy Agency. Participants engaged in lively discussions on a wide range of energy issues, including: the global economic outlook; the geopolitics of energy; the oil market; the gas market; the US energy scenario and implications for global energy markets; and the power sector, decarbonization, and climate change.

2014 Oil Day – Global Shifts in Oil Markets and Financial Regulation

In April 2014, the OIES successfully held its annual 'Oil Day'. This year's event, kindly supported by ICE, focused on three main themes: recent shifts in global oil market dynamics; shifts in global oil trade flows and implications for global and US benchmarks; and regulatory reforms of financial benchmarks and their impact on oil price discovery. The conference was attended by 30 key oil industry figures, representatives from IOCs, NOCs, financial institutions, price assessment agencies, the energy business community, as well as OIES staff.

In addition, the OIES organized a conference, kindly supported by the Kuwait Foundation for the Advancement of Sciences, on 'Future Energy Challenges for the GCC States'. There were three main themes throughout the day: the US shale revolution and its impact on the GCC; energy sector regulation, energy efficiency, and domestic pricing in the GCC; and energy alternatives for the GCC – namely, nuclear power and renewable energy. We were joined by over 35 participants from a variety of backgrounds and were delighted to be able to host over 20 participants from the GCC states.

2014 Gas Day

The OIES Natural Gas Research Programme organized its ninth annual 'Gas Day' in October 2014, with three sessions dedicated to discussing current issues in the gas sector. The first session focused on the implications of the 2014 crisis for Russia and Ukraine. The second – entitled 'Replacing Russian Gas – What are the Options for Europe?' – discussed the alternative gas supply options to Russian gas for Europe on a timescale to 2030. The final session on 'Global LNG Supply Growth – Are We Heading for a Bubble?' discussed the near-term market dynamics and prospects for new supply from North America, Australia, Russia, East Africa, and East Mediterranean. The event, held at St Anne's College, Oxford, was attended by over 90 invitees, including sponsors of the OIES and the Natural Gas Research Programme and invited guests from the academic, media, and corporate sectors.

Gas Programme Sponsors' Meetings

The OIES Natural Gas Research Programme held its bi-annual sponsors' meetings on 13–14 May and 21–22 October 2014 at St Hugh's College, Oxford. The meetings, attended by the gas

programme sponsors and authors from a range of countries and backgrounds, including academia, industry, and energy journalism, discussed ongoing research projects and progress reports.

The May meeting presented conclusions on two books published in 2014: one on Russia and one on the outlook for Iranian gas. Other research topics discussed included: European demand, gas as a transport fuel, LNG cost trends, new European gas transport infrastructure regulation, German energy policy, hub price correlation, the Turkish gas market, challenges to JCC in the Asian LNG market, Indian gas price reform, Chinese pricing policy, and Australian LNG.

The October meeting focused on further developments to work in progress from the May meeting and also covered prospective research papers on: roles and risks of key players in the evolving European gas market, the gas transport regime in Russia, European hub price behaviour, the Brazilian gas market, the role of LNG in South America, Azerbaijan's supply outlook, challenges for Qatar LNG, Russian LNG prospects in Asia, and Canadian gas.

Library

In 2014, the library underwent an extensive renovation and reorganization to address a lack of both physical and digital space. Physically, the library had reached saturation point, with no room to house new books or journals. Digitally, there was no way to search the collections, nor was there an online platform to make the library visible to those outside the institute.

New shelving was built on both floors of the library, increasing shelving space from 237 to 417 metres. The entire book collection was moved to the lower floor, providing more convenient access, and all journals and reports were relocated to the upper floor. A new classification system (shelf location) was put in place, and use of the Dewey Decimal Classification system provided much greater depth and precision in the grouping of books.

In order to make the collections searchable and more useful to all researchers, an online catalogue was established. SOLO, the catalogue selected, has a high academic profile and is the catalogue used by the University of Oxford. SOLO provides the OIES with one of the highest quality information retrieval systems in the world. The catalogue records are constructed to Resource Description and Access (RDA) standard. RDA is at the forefront of current metadata practice (so far used by only a handful of international companies and major libraries) and vastly improves the ability to search for and find information. It also facilitates far better links to the digital world, thus placing the library's ability to search its collections on a par with large institutions such as the British Library. By the end of 2014 some 1,500 titles had been added to SOLO, many of them unique to the OIES and unavailable in any other university library.

The library serves a vital role in collecting, preserving, and providing information which is not otherwise available. Many of its pre-1999 statistics and older journal runs cannot be found online, nor can the library's ever-growing collection of company annual reports and historical reports. The newly created shelving space has ensured that the library is well placed to continue building its collections and making them as accessible as possible.

In keeping with the institute's policy to maintain the collection as a valuable research tool, and to ensure it is as widely accessible as possible, borrowing privileges were formally extended to graduate students at the University of Oxford. There was an increased number of visitors to the library in 2014, a rewarding indication that the work involved in the refurbishment and modernization of the library and its unique collection is very much worthwhile. The institute was pleased to welcome visitors from the University of Oxford, other UK universities, and a number of overseas researchers whose interests included Chinese energy policy in Asia and the approach to the 1973 oil crisis from the point of view of oil majors.

The OIES would like to offer thanks to the following organizations and publications for supplying – either free of charge or at substantially discounted prices – important trade journals, statistical sources, and other materials vital to our research work, which could not have been afforded otherwise: Blackwell's, Elsevier, Energy Intelligence Group, the European Commission, ICEED, IEA, IFS, IMF, *Gas Matters*, *Global Market Briefings*, the *Middle East Economic Survey*, Morningstar, OAPC, OPEC, OECD, Oxford University Press (OUP), Argus Media, and Petroleum Intelligence.

Research Team and Staff

Christopher Allsopp CBE, became non-executive president of the OIES in January 2014, having been the institute's director from 2006. He is also: emeritus fellow of New College, Oxford; editor of the *Oxford Review of Economic Policy*; a director of Oxford Economic Forecasting; and author of the *Review of Statistics for Economic Policymaking* – also known as 'The Allsopp Review'. He has previously worked at HM Treasury and the OECD, while at the Bank of England he was an adviser (1980–83) and a member of the Court of Directors (1997–2000) and of the Monetary Policy Committee (2000–03). He has had extensive involvement with domestic and international policy issues as consultant to international institutions and private-sector organizations, and has published extensively on monetary, fiscal, and exchange rate issues, as well as the problems of economic reform and transition. His involvement in the economics of oil and other energy issues goes back to the shocks of the 1970s.

David Buchan, Senior Research Fellow, joined the OIES in January 2007. Educated in Oxford and Geneva, he began his writing career in 1970 with *The Economist*. In 1975 he joined the *Financial Times*, where he remained until 2006, rising to energy editor (2000–2002). He was a foreign correspondent posted in Brussels, Washington DC, and Paris, and when based in London he covered energy, defence, the Soviet bloc, and diplomacy. At the OIES, he specializes in the energy and climate policies of the European Union. He has written two books for the institute, namely, *Energy and Climate Change: Europe at the Crossroads* (OUP, 2009) and *The Rough Guide to the Energy Crisis* (Penguin, 2010), and is currently working on a third, with OIES colleague Malcolm Keay, on the EU's 'European Energy Union' plan, due for publication by OUP in autumn 2015.

Bassam Fattouh, was appointed director of the Oxford Institute for Energy Studies in January 2014. He is also professor at the School of Oriental and African Studies and has published a variety of articles on the international oil pricing system, OPEC pricing power, security of Middle Eastern oil supplies, and the dynamics of oil prices and oil price differentials. This work has appeared in *Energy Economics*, *The Energy Journal*, and *Energy Policy*. Dr Fattouh served as a member of an independent expert group established to provide recommendations to the 12th International Energy Forum (IEF) Ministerial Meeting in Cancun (29–31 March 2010) for strengthening the architecture of the producer–consumer dialogue through the IEF. Bassam Fattouh has also written widely on non-energy related issues, with his work published in the *Journal of Development Economics*, *Oxford Review of Economic Policy*, *Economic Inquiry*, *Empirical Economics*, *Journal of Financial Intermediation*, *Economics Letters*, *Journal of Futures Markets* and *Macroeconomic Dynamics*, and in other journals and books.

Patrick Heather, Senior Research Fellow, joined the institute in June 2006. His works include: 'The Evolution and Functioning of the Traded Gas Market in Britain' (August 2010); a co-authored comment with Jim Henderson, 'Lessons from the February 2012 European gas crisis' (April 2012); and the paper 'Continental European Gas Hubs: are they fit for purpose?' (June 2012). He is currently continuing his research on the development of the European gas hubs, with particular focus on the evolution of the gas markets across the continent in the context of the European Commission's vision of a single energy (gas) market; the results will be published in a new paper in the summer of 2015. Since 2004, Patrick has been an independent consultant focusing on the gas market evolution in Europe, supply and demand dynamics, the impact of regulation on market outcomes, contracting strategy, and marketing strategies to take advantage of new market opportunities. Patrick has advised and given presentations to many different organizations, including futures exchanges and various producer and end-user companies, financial institutions, regulators, and governments in Austria, Brazil, Britain, Estonia, France, Greece, Holland, Italy, Norway, the Philippines, Poland, Russia, Sweden, and Turkey. In 2006, he was appointed commercial adviser to South Hook Gas to assist them through the long commissioning phase of their world-leading LNG import facility in South Wales, which was successfully achieved in 2009. Patrick has over 35 years' experience of broking, trading, and risk management in the natural gas, power, oil, and oil products markets, working as an expert for European utilities and gas suppliers, British investment banks, and international oil majors.

James Henderson, Senior Research Fellow, works on the OIES gas and oil programmes, covering Russia and CIS issues as well as global energy matters that affect the region. He is a BP energy professor at the Skolkovo Management School in Moscow and lectures on energy issues at a number of universities in Europe. His publications include numerous papers on the Russian oil and gas sector, a 2010 book entitled *Non-Gazprom Gas Producers in Russia*, the co-editing of *The Russian Gas Matrix: How Markets Are Driving Change* for OIES (May 2014), and the recently published *International Partnership in Russia* (March 2014).

Anouk Honoré, Senior Research Fellow, joined the OIES Natural Gas Research Programme in 2004. Her research focuses on European natural gas issues, with particular emphasis on the gas market fundamentals, energy policies, and power generation. Her main areas of expertise include building scenarios on natural gas demand and supply in 36 European countries (the 28 member countries in the European Union plus Albania, Bosnia and Herzegovina, Norway, Republic of Macedonia, Serbia, Montenegro, Switzerland, and Turkey). She also works on the natural gas markets in South America. She is the author of various research papers and book chapters, with her own book *European Natural Gas Demand, Supply and Pricing: Cycles, Seasons and the Impacts of LNG Price Arbitrage* published by the Oxford University Press in 2010. Before joining the institute, she worked at the International Energy Agency (IEA) in Paris. Her work focused mainly on natural gas issues in the IEA member countries, particularly in China and in Latin America. Dr Honoré holds a PhD in economics, an MA in environmental and natural resources economics, and an LLM in international administration (public law).

Laura El-Katiri, Research Fellow, joined the OIES in 2009 and works on the OIES Oil and the Middle East Programme. She formerly taught at the SOAS Department of Financial and Management Studies. Her primary research focuses on oil, energy, and development in the Middle East and North Africa. Laura has published widely on sustainable energy management in the GCC states, energy pricing and subsidy reform, and energy poverty. She holds degrees from the University of Oxford and the University of Exeter.

Malcolm Keay, Senior Research Fellow, joined the OIES in January 2005. His career has ranged widely across the energy scene, including roles in: the public sector, as director of energy policy at the UK DTI (1996–1999) and division head at the International Energy Agency; the private sector, as senior managing consultant at Oxera; and the non-profit sector, working at Chatham House and the World Coal Institute. He has acted as an adviser for many energy studies, including as special adviser to a House of Lords committee inquiry into energy security in Europe, and director of the energy and climate change study for the World Energy Council. His research focuses on the implications of electricity market liberalization for the achievement of key energy policy objectives, particularly in relation to the environment. He contributed the chapter entitled ‘Can the Market Deliver Security and Environmental Protection in Electricity Generation?’ to *UK Energy Policy and the End of Market Fundamentalism*, edited by Ian Rutledge and Philip Wright (OUP, 2011). It updated the analysis and conclusions of his 2006 monograph, *The Dynamics of Power*, to argue that governments have failed to develop policies which will enable them to meet their environmental targets in the context of liberalized markets, and that more interventionist approaches would be needed.

David Ledesma, Research Fellow, is an independent gas and LNG consultant focusing on gas and LNG strategy along the value chain, including the structuring of commercial arrangements, financing, and markets for pipeline gas and LNG projects. Since joining the institute in November 2007, he has contributed chapters to several of the institute’s books, namely: *Natural Gas in Asia* (2008), *Natural Gas in the Middle East and North Africa* (2011), and *The Pricing of Internationally Traded Gas* (2012). He has also published a number of papers, including: ‘The Changing Relationship between NOCs and IOCs in the LNG Chain’ (July 2009); ‘East Africa Gas – Potential for Export’ (March 2013); and ‘The Future of Australian LNG Exports: Will Domestic Challenges Limit the Development of Future LNG Export Capacity?’ (September 2014). David also contributed the book chapter ‘Project Financing LNG Projects’ to *The Principles of Project Finance* (Gower Publishing, 2012). David also gives numerous commercial training courses on gas and LNG in the UK and overseas, writes on gas and LNG, and presents regularly at conferences. During 30 years in the energy and utilities sector, David has worked on the development of complex integrated energy projects, negotiations at government level, and in the management of joint ventures. With Shell, he worked in Malaysia and the Netherlands, travelled extensively to Oman and Asia, and was a key member of the team that closed a major LNG project in the Middle East. He is an experienced commercial manager with hands-on experience of developing and closing commercial gas transactions as well as developing business strategy. From 2000 to 2005, as director of consulting then managing director of the Gas Strategies Group (formally EconoMatters Ltd), David worked on and managed LNG and gas consulting assignments around the world. He has a degree in economics and geography from the University of Exeter.

Xin Li, Research Fellow, joined the institute in December 2013. He holds an MSc in management from Leeds University Business School and a PhD in ecological economy from the School of Earth and Environment, University of Leeds. Prior to joining the Oxford Institute for Energy Studies, he worked as a research fellow at the Sustainability Research Institute, University of Leeds. Xin Li specializes in input-output analysis and hybrid life-cycle analysis. His research focuses on assessing the environmental impacts of energy technology in both developed and developing countries, measuring emissions

embodied in trade, and constructing multi-regional input-output tables. His current research focuses on economic development in China and its implications on energy consumption and CO₂ emissions.

Robert Mabro, CBE, Honorary President, was director of the OIES until April 2003. He is an emeritus fellow of both St Antony's College and St Catherine's College, Oxford, and is honorary secretary of the Oxford Energy Policy Club. Robert Mabro stepped down as OIES president in November 2005, before the board elected him honorary president in November 2006.

Lavan Mahadeva, Senior Research Fellow, joined the institute in August 2011 and led the institute's macroeconomic research, focusing on the interaction of energy markets with the macroeconomy and international finance. He has worked on what constitutes good macroeconomic policy in energy exporting countries and whether global financial market conditions affect energy prices. Prior to joining the OIES, Lavan Mahadeva was a Bank of England economist for 16 years. He began by modelling and forecasting the UK economy before joining the Bank of England's Centre for Central Banking Studies (CCBS) and working with other central banks in Africa, Central and Eastern Europe, and Latin America in constructing their monetary policy strategies. His remit was to develop models to guide policy in challenging environments. He was an adviser to the Bank of England Monetary Policy Committee (MPC) 2005–06 and spent 2007–09 as adviser to the Central Bank of Colombia's governor. Just before coming to the institute, he worked on cross-sectional systemic risk and international finance. Lavan has published on the transmission mechanism of monetary policy, monetary policy frameworks, and interbank contagion. He co-produced an award-winning book on *Monetary Policy Frameworks in a Global Context*. Lavan has a BA from Trinity College, Cambridge, an MSc from the University of Warwick, and a PhD from the European University Institute. Lavan left the institute in early 2014 to take up a position in London.

Benito Müller, Director, Energy and Climate Change, joined the OIES in 1996. He is also managing director of Oxford Climate Policy, a not-for-profit company aimed at capacity building for developing country climate change negotiators, and director of the European Capacity Building Initiative (ecbi), an international initiative for sustained capacity building in support of international climate change negotiations. At Oxford University, Dr Müller is a supernumerary fellow of Wolfson College, a member of the Faculty of Philosophy, and an associate of the Smith School for Enterprise and Environment. He has been serving as adviser to the LDC (Least Developed Countries) Group Chair (2011–12) and the Africa Group Chair (2012–13). He participated in the deliberations of the Transitional Committee (TC) for the Green Climate Fund (GCF) as adviser to the LDC TC members. He has also been advising on GCF board. Dr Müller received his doctorate (DPhil) in philosophy from the University of Oxford, where he was formerly a research fellow at Wolfson College and a lecturer in logic at the Queen's College. He has a diploma in mathematics from the Eidgenössische Technische Hochschule (ETH) in Zürich, Switzerland. Benito left the institute in autumn 2014 to focus on his work as director of Oxford Climate Policy.

Keun-Wook Paik, Senior Research Fellow, joined the OIES in January 2007. He is a specialist on North-East Asia's oil and gas issues, particularly Sino-Russian oil and gas cooperation, China's natural gas industry, and DPRK's offshore oil exploration. He is also currently an associate fellow of the Chatham House Energy, Environment and Development Programme. He is the author of *Gas and Oil in North-East Asia: Policies, Projects and Prospects* (London: Royal Institute of International Affairs, 1995), and co-author/supervisor of *China Natural Gas Report* (China OGP, Xinhua News Agency, and RIIA, 1998). Dr Paik has contributed well over 40 papers to a myriad of publications including: *Energy Policy*, *Journal of Energy and Development*, *Geopolitics of Energy*, *The Pacific Review*, *Oil & Gas Journal*, *Petroleum Economist*, *FT Asia Gas Report*, *China Daily Business Weekly*, *China Brief*, and *Asia-Pacific Review*. His book *Sino-Russian Oil and Gas Cooperation – The Reality and Implications* (OUP, 2012) has also been published in Chinese (in January 2013) and Korean (in March 2014), with a Japanese version due for publication in mid-2015. In 2013, he was invited as adjunct professor by both Yonsei University (South Korea) and by China Petroleum University (Beijing).

Beatrice Petrovich, Research Fellow, joined the OIES in November 2012 after conducting European gas hubs research with the institute in August 2012. Her paper on European gas hub price correlation was published in October 2013. Beatrice is currently based in Milan, where she works as researcher and consultant at REF-E, a leading energy consultancy in Italy. Among other activities, she works for the REF-E Energy Observatory, specializing in the analysis of the natural gas market and energy regulation, and contributes to the editing and writing of the observatory's monthly newsletter. She holds an MSc in economics from the University of Milan Bicocca and completed a one-year exchange at the University of Glasgow. While at university, she collaborated on a research project in the field of experimental economics.

Simon Pirani, Senior Research Fellow on the OIES Natural Gas Research Programme, joined the institute in September 2007. His research focuses on the development of natural gas markets and changing consumption patterns in the former Soviet Union. Most recently, he was editor of and contributor to *The Russian Gas Matrix: How Markets Are Driving Change* (OUP, 2014). Other publications include: (as author or co-author) a series of OIES publications on the Ukrainian gas sector and Russo-Ukrainian gas relationships, including 'What the Ukrainian Crisis Means for Gas Markets' (2014); OIES working papers including 'Elusive Potential: Natural Gas Consumption in the CIS and the Quest for Efficiency' (2011) and 'Central Asian and Caspian Gas Production and the Constraints on Export' (2012); and, as editor, a book entitled *Russian and CIS Gas Markets and Their Impact on Europe* (OUP, 2009). Simon is currently working on a history of global fossil fuel consumption 1950–2014, alongside his work on gas issues. He studied Russian at the University of London, wrote a doctoral dissertation at the University of Essex, and is the author of *The Russian Revolution in Retreat* (Routledge, 2008) and *Change in Putin's Russia: Power, Money and People* (Pluto, 2009). Prior to joining the institute, he covered the Russian and Ukrainian economies as a journalist. Since 2012, he has been teaching Russian and Soviet history at Canterbury Christ Church University.

John Rhys, Senior Research Fellow, joined the OIES in March 2010, having been one of its senior research advisers. He obtained a degree in mathematics while at Jesus College, Oxford, and later obtained his PhD in economics at the London School of Economics. He is a former chief economist at the Electricity Council and a former managing director of NERA UK Economic Consulting, where he was intimately involved in a number of UK energy sector privatizations. As director of NERA's international energy team, he worked extensively on energy sector reform projects worldwide with the World Bank, other development agencies, and national governments. He continues to have economic and energy consulting interests, is a non-executive director of an NHS hospital trust, and a visiting fellow at the Sussex Energy Group, University of Sussex. His current interests include energy policy in relation to climate change, a subject on which he has given written and oral evidence to the Environmental Audit Committee of the House of Commons and provided evidence to the Joint Committee on the Climate Change Bill.

David Robinson, Senior Research Fellow, joined the OIES in July 2007. He is a consulting economist who advises on public policy and corporate strategy, especially in relation to energy and climate change. He runs his own consulting company (DRA), is an academic adviser to The Brattle Group of consultants, and was previously a director of NERA, where he was the co-chair of European Operations and of the Global Energy and Telecom Practices. He also worked at the International Energy Agency (IEA), and wrote his doctoral dissertation at the University of Oxford on the vertical disintegration of the international petroleum industry.

Howard Rogers, Director, Natural Gas Research Programme, joined the institute in January 2009 and succeeded Jonathan Stern as director of the gas programme in October 2011. Prior to joining the institute, Howard was with BP for 29 years, mostly in business development, strategy, planning, mergers and acquisitions, and negotiation roles in upstream oil and gas in European, North American, Middle East, and FSU locations. In 1999, Howard joined BP Gas and Power, becoming head of global gas fundamental analysis in 2003. He has a degree in chemical engineering and is a fellow of the Institution of Chemical Engineers.

Howard has published research papers and authored book chapters on: LNG price arbitrage between the regional markets of Asia, Europe, and North America; shale gas in the US and UK; the interaction between wind power generation and gas in the UK; and the outlook for gas with CCS. More recently, Howard and Jonathan Stern have jointly written papers on the transition to hub-based pricing in Europe and the changing roles and risks of key players, and also on the challenges to JCC pricing in Asian LNG markets.

Howard enjoys the challenge of ensuring the gas programme identifies the key current and upcoming issues in natural gas, matching these with researchers, and producing high quality publications. This is enhanced by an ongoing and dynamic interaction with programme sponsors and stakeholders.

Anupama Sen, Senior Research Fellow, joined the OIES in October 2009 to work on the economics of energy in India. She holds a BA in economics from the University of Mumbai, an MSc in economic development from the London School of Economics, and a PhD from the University of Cambridge, where she was a Cambridge Nehru Scholar. Her areas of expertise include policy on pricing, taxation, and regulation of oil, gas, and electricity in India, with extensions to other developing economies, and she has carried out extensive fieldwork in India in relation to her research. Her current work focuses on gas pricing, electricity market reform, auctions for the allocation of energy resources in India, and the fiscal regime for exploration.

Anupama is a fellow of the Cambridge Commonwealth Society, was previously a visiting fellow at Wolfson College, Cambridge, and is now also a region head on the Asia–Pacific desk at Oxford Analytica.

Jonathan Stern, Senior Research Fellow and Chairman of the Natural Gas Research Programme, has a range of other roles, including: honorary professor at the Centre for Energy, Petroleum & Mineral Law & Policy, University of Dundee; visiting professor at the Centre for Environmental Policy, Imperial College London; fellow of the Energy Delta Institute; a member of the board of advisers for the Center for Energy Economics, Bureau of Economic Geology at University of Texas at Austin; and, since 2011, the EU Speaker for the EU–Russia Gas Advisory Council. He is the author and editor of several books, including: *Natural Gas in Asia: The Challenges of Growth in China, India, Japan and Korea*, the second edition of which was published by OUP in 2008; co-editor with Bassam Fattouh of *Natural Gas Markets in the Middle East and North Africa* (OUP, 2011); and editor of *The Pricing of Internationally Traded Gas* (OUP, 2012). In 2014, his publications included chapters in James Henderson and Simon Pirani’s edited book *The Russian Gas Matrix: How Markets Are Driving Change*, published by Oxford University Press, as well as the papers (co-authored with other members of the gas programme) ‘Reducing European Dependence on Russian Gas – Distinguishing Natural Gas Security from Geopolitics’ and ‘The Dynamics of a Liberalised European Gas Market: Determinants of Hub Prices and Roles and Risks of Major Players’.

Katja Yafimava, Senior Research Fellow, joined the OIES Natural Gas Research Programme in November 2006. She holds a DPhil in geography and an MPhil in Russian and East European studies from Corpus Christi College, Oxford. She is the author of *The Transit Dimension of EU Energy Security: Russian Gas Transit across Ukraine, Belarus, and Moldova*, a book published by OUP in 2011, which was launched in London (Chatham House) and Brussels (CEPS). She is also the author and co-author of several chapters in *The Pricing of Internationally Traded Gas*, edited by Jonathan Stern (OUP, 2012), and *Russian and CIS Gas Markets and Their Impact on Europe*, edited by Simon Pirani (OUP, 2009), as well as co-author of several working papers on Russia–CIS gas transit disputes together with Simon Pirani and Jonathan Stern. She also reviewed several papers for *Journal of European Integration* and *The Energy Journal*. In 2013, she began to work on EU gas regulation and published a working paper ‘The EU Third Package for Gas and the Gas Target Model’ and continued her work as an expert for the EU–Russia Gas Advisory Council. Prior to joining the institute, and in parallel with her doctoral studies, she interned at Shell (2005) and at the Energy Charter Secretariat (2006).

Shamil Midkhatovich Yenikeyeff, Research Fellow, is a senior associate member at the Russian and Eurasian Studies Centre, St Antony’s College, University of Oxford. Dr Yenikeyeff writes and presents on Russian–European energy relations, Russia and OPEC, Caspian and Central Asian energy issues, and the development of Arctic hydrocarbons. His publications have appeared in a number of industry and academic journals and publications. Among the latest of these include: the chapter ‘Oil and the Corporate Re-Integration of Russia: The Role of Federal Oil Companies in Russia’s Center–Periphery Relations’ in the book by Douglas Chalmers and Scott Mainwaring (ed.), *Problems Confronting Contemporary Democracies* (University of Notre Dame Press, 2012); and a working paper ‘Governors, Oligarchs, and Siloviki: Oil and Power in Russia’ (co-authored with Ahmed Mehdi) published in English, French, and Russian by Institut français des relations internationales (IFRI) in 2013. Shamil left the OIES in autumn 2014 to set up his own consultancy.

Renfeng Zhao, Research Fellow, joined the institute in 2007 to participate in a project on clean, balanced development in China. His work focuses on China’s energy strategy and development policies, and China’s energy diplomacy and its geopolitical implications. He recently advised both Chinese state-owned and private energy companies on their trade and investment issues in Europe. Previously, he worked at *China Daily* as an energy correspondent in Beijing. He holds a double master’s degree in journalism and global studies from EU Erasmus Mundus Programme, and was a Parvin/Freedom Forum Fellow at the University of Hawaii and the East–West Center.

The following staff contributed to the work of the OIES in 2014. Their dedication and professionalism was essential to its continued smooth running.

- **Lindsey Barker** is responsible for the institute’s accounts.
- **Lavinia Brandon** was responsible for maintaining the institute’s library, she retired in early 2014 after over 20 years of service.
- **Jo Ilott** provides administrative support for the OIES Natural Gas Research Programme.

- **Margaret Ko** was responsible for the institute's accounts and retired from the institute in early 2014 after nearly 30 years of service.
- **Susan Millar** manages the Oxford Energy Policy Club and Oxford Energy Seminar.
- **Scott McLachlan** is responsible for the reorganization, modernization, and maintenance of the institute's unique library.
- **Hannah Shipton** provides administrative support.
- **Kate Teasdale** is administrator and company secretary.

Visiting Research Fellows, Research Associates

Ali Aissaoui, Research Associate, is a senior policy consultant at the Arab Petroleum Investments Corporation (APICORP), where he was formerly head of economics & research. Formerly a senior research fellow at the OIES, Ali has previously served as energy policy adviser to the Algerian government and Sonatrach, and has been the country's representative on the governing board of OPEC.

At APICORP, his duties include the scanning of the corporation's business environment in the Middle East and North Africa, a region with a wide variety of challenges and opportunities. Obviously, such a task has become much more difficult in the volatile and uncertain aftermath of the Arab uprisings.

Otherwise, he has been devoting himself to research on topics related to energy markets and prices, energy investment and financing, and the political economy of the major petroleum-producing countries. In addition to informing policy decision-making, he regularly shares his research findings through publications and also puts them to good use as a speaker, discussant, and peer reviewer. He is an active member of the International Association for Energy Economics, the Oxford Energy Policy Club, the Arab Energy Club, and the Paris Energy Club.

Robert Arnott, Research Associate, is currently a director of Rocksource ASA and Core Energy AS. He has previously held board-level positions at various E&P companies, including Petroceltic International Ltd, Spring Energy AS, Oyster Petroleum Ltd, and Impax Environmental Markets plc. He worked as a senior fellow at the OIES from 2001 to 2005, focusing on all aspects of mature oil and gas provinces, as well as the corporate strategies of the major upstream energy companies. He has a strong background in all aspects of exploration and production and is recognized for his research into the oil and gas industry. After working as a geologist and economist with Royal Dutch Shell, he began working in the City of London in 1991, holding senior positions as an oil and gas equity analyst at Goldman Sachs and Morgan Stanley for 10 years.

Juan Carlos Boué, Research Associate, is an oil industry consultant who started his career working for the international trading arm of Petróleos Mexicanos (PEMEX). He rejoined the OIES in 2010, having previously been a fellow at the institute from 2000 to 2004. His professional activities have focused on petroleum, alternating between academia and industry. From 2005 to 2009, he was special adviser to the Venezuelan energy and petroleum minister and sat on the boards of most of Petróleos de Venezuela's (PDVSA) refining ventures abroad. He has written widely on the industrial economics of oil and gas exploration and production, petroleum refining industries, as well as on taxation and the political economy of oil in general. His current research concerns the governance mechanisms and legal structure underpinning the international oil industry. He is author of *A Question of Rigs, of Rules, or of Riggging the Rules? Upstream Profits and Taxes in US Gulf Offshore Oil and Gas* (OUP, 2006).

Michael Bradshaw, Senior Visiting Research Fellow, joined the OIES in August 2008 and is also a professor at Warwick Business School, teaching on the global energy MBA programme. Before taking up this post in January 2014, he was professor of human geography at the University of Leicester. His PhD is from the University of British Columbia, Canada. His research is on resource geography, with a particular focus on the economic geography of Russia and global energy security. In 2007, he was awarded the Royal Geographical Society's Back Award for his applied research on economic change in post-socialist economies. Most recently, his research has focused on energy-related issues, including the development of the Sakhalin oil and gas projects in the Russian Far East and energy security in North-East Asia. From 2008 to 2011, he was engaged in a programme of research funded by a Leverhulme Trust Major Research Fellowship that examined the relationship between energy security, globalization, and climate change. This led – in October 2013 – to the publication of his book, entitled *Global Energy Dilemmas*. He also recently completed a project on the UK's *Global Gas Challenge*, funded by the UK Energy Research Centre. He is editor-in-chief of Wiley-Blackwell's *Geography Compass*, co-editor of *European Urban and Regional Studies*, and contributing editor of *Eurasian Geography*. In addition to his involvement with the OIES, he is an honorary senior research fellow at the Centre for Russian, European and Eurasian Studies at the University of Birmingham and visiting professor of human geography at the University of Leicester.

Michael Xiaobao Chen, Visiting Research Fellow, is a manager at Statoil, where he has previously worked on global upstream strategy and business development. Having been an OECD economist, specializing in China and India's development impacts on global commodity markets, he moved to the International Energy Agency, covering Asian energy outlook, G20 global fossil fuel subsidy initiatives, and global oilfield decline rate analysis. His areas of expertise include: the Chinese gas & LNG markets, gas pricing, energy reforms and economic transition, strategy of NOCs, ASEAN energy markets, and upstream industry trends. Since joining the institute in 2011, he has contributed a chapter to *The Pricing of Internationally Traded Gas* (OUP, 2012) and published a paper entitled 'The Development of Chinese Gas Pricing – Drivers, Challenges and Implications for Demand' (July 2014). Michael holds an MSc in economics from University College London and an MSc in development from the London School of Economics.

Sylvie Cornot-Gandolphe, Research Associate, is an independent consultant on energy and raw materials, focusing on international issues. Since 2012, she has collaborated with: the energy centre of the Institut français des relations internationales (IFRI), as a research associate; CycloPe, the reference publication on commodities; CEDIGAZ, the international centre of information on natural gas of IFPEN; and, since 2014, the OIES. Sylvie Cornot-Gandolphe gained her experience and expertise in global gas and energy markets in her previous roles at IFPEN/CEDIGAZ, the UN/ECE, the IEA, and ATIC Services. She is the author of several reference publications on energy markets, while her latest publications include reports on gas and coal, including: 'Japan's New Energy Policy' (CEDIGAZ Insight, November 2014); 'China's Gas Strategy' (IFRI, November 2014); 'Coal and Coal Competition in the EU Power Sector' (CEDIGAZ, June 2014); 'Shale Gas Development in Europe' (IFRI, January 2014); 'The Impact of the US Shale Gas Revolution on Europe's Petrochemical Industries' (IFRI, November 2013); 'Underground Gas Storage in the World' (CEDIGAZ, June 2013); and 'Global Coal Trade: From Tightness to Oversupply' (IFRI, February 2013).

Hakim Darbouche, Research Associate, is a commercial adviser with OMV E&P, working on commercial operations and business development in the UKCS. He joined OMV in January 2013 after spending three and a half years at the OIES, where he led research on MENA natural gas markets and North African energy issues. He was also an independent consultant with clients in the public and private sectors. He holds a BA from Sussex University and a PhD from the University of Liverpool.

Ralf Dickel, Senior Visiting Research Fellow, has been an independent expert on energy trade since October 2010, when he left the Energy Charter Secretariat after six years as director for transit and trade. As head of the energy diversification division at the International Energy Agency, from 2001, he was responsible for policy analysis of energy markets and of energy market reform. Before joining the IEA, he worked as senior specialist for oil and gas policy for the World Bank, this after a long career with Ruhrgas (1980–1998), where he held various management positions both in the gas purchase and the gas sales departments. Dickel managed and co-authored several publications at the IEA and the Energy Charter Secretariat, including *Security of Gas Supply in Open Markets* (IEA, 2004) and *Putting a Price on Energy* (Energy Charter, 2007).

John Elkins, Research Associate, joined the OIES in January 2008. In addition to editing many of the gas programme working papers, he wrote the paper 'Natural Gas in the UK: An Industry in Search of a Policy?' published in 2010. Elkins was formerly managing editor of the Gas Strategies publications department, responsible for *Gas Matters*, *Gas Matters Today*, and other publications. He is still actively involved as associate editor, and is a regular presenter at the Gas Strategies 'Gas Chain' training course. He joined Gas Strategies as a consultant in 1995 after leaving British Gas HQ, where he held various posts involving liaison with regions on annual and peak forecasting methodology, and preparation of amalgamated national, annual, and peak supply and demand forecasts. He was secretary of the matching panel, which advised the British Gas board on supply/demand issues for company plans and negotiations with Ofgas, OFT, and the Monopolies Commission.

Chris Le Fevre, Senior Visiting Research Fellow, joined the OIES in September 2012. He has published working papers on gas storage in Great Britain (January 2013) and the potential for natural gas as a transportation fuel in Europe (March 2014), and is presently working on a study of the impact of UK energy policy on the gas sector. Chris has worked as an independent energy consultant since 2002, specializing in commercial, strategic, and regulatory issues in the natural gas sector, with particular focus on European and former Soviet markets. Chris has worked in the oil and gas industry for over 30 years. He has held a variety of positions to executive director level at Transco plc (now National Grid Gas plc) and British Gas. At Transco, he was the director responsible for implementing the 'Network Code' and the introduction of domestic competition. His roles at British Gas included establishing operations in a number of European countries, including Spain, the former German Democratic Republic (East Germany), Hungary, and the

Czech Republic. Before British Gas, he worked for Shell in exploration and production companies in the Netherlands and Malaysia. He is also a contributor to Oxford Analytica and, until 2011, sat on the boards of the Northern Ireland Utility Regulator and the South Central Strategic Health Authority.

Andy Flower, Research Associate, works as an independent consultant specializing in the LNG business, particularly: strategy, marketing, project structures, shipping, pricing, supply and demand, and project economics. He retired from BP in 2001 after 32 years of service, which included 22 years involved in LNG and natural gas business activities, culminating in his role as global LNG senior adviser. At various times during his career, Flower was involved in liquefaction projects in Nigeria, Abu Dhabi, Australia, Qatar, Indonesia, and Trinidad. He has provided advice to companies planning LNG receiving terminals in North America, Europe, and Asia, and has negotiated LNG sales contracts with buyers in all the major LNG markets.

Floris van Foreest, Research Associate, is an experienced consultant in the field of power and gas market analysis, scenario development, and sustainability. His current research is focused on the role of gas in the energy transition. Earlier in his career, he held various roles in multinational companies. Floris has master's degrees in business administration and financial management from the University of Groningen and in political science from the University of Amsterdam.

Florence Gény, Research Associate, is Ophir-Energy's new business manager (Africa). Previously, she worked in business development and strategy in international exploration and production for Statoil. Her main areas of expertise are upstream contracts (fiscal regimes, production sharing, joint operatorship), commercial structures (particularly in gas value chains), and energy industry trends. Her research currently focuses on unconventional gas in North America and Europe and its impacts on gas markets. She graduated from École des Hautes Etudes Commerciales (HEC) with a master's degree in science of management and from Université Paris XI with a master's degree in business law.

Olga Glebova, Research Associate, completed her PhD thesis on Fischer Tropsch Gas-to-Liquid (FTGTL) efficiency and prospects in Russia in 2013. She holds a first degree from Gubkin Russian State University of Oil and Gas. Olga is currently based in Moscow, where she works for the International Business Department of Gazprom. She is the author of a number of articles, including 'Large-Capacity Industrial GTL Production: Pricing Formation', 'Economic Efficiency of FTGTL Production in Russia', and 'Estimation of Capital and Operational Expenditures of FTGTL Projects in Russia'. Olga co-authored a book, *Synthetic Liquid Hydrocarbons: Technology, Economics, and Production*, which was successfully presented in Russia. She is currently co-authoring a book entitled *Local Content in the Petroleum Industry*.

Ieda Gomes, Senior Visiting Research Fellow, is the director of Energix Strategy Ltd, a consultancy specializing in energy strategy, natural gas and LNG supply, pricing, contracts, and market fundamentals. In a career spanning 30 years in the gas and energy industry, Ieda has spent more than 13 years with BP, where she held senior positions, such as: vice president of new ventures for South Asia and Middle East, president of BP Brasil, and vice president of regulatory affairs for BP Gas and Power. Prior to BP, Ieda was the CEO of the S. Paulo Gas Company (Comgas), the largest gas distribution company in Brazil. Ieda is currently a councillor at the Brazilian Chamber of Commerce in Great Britain, a director at the Department of Infrastructure of the S. Paulo Federation of Industries, a member of the advisory board of Comgas, and sits on the board of directors of both Bureau Veritas and InterEnergy Holdings. Ieda is a senior adviser of the Brazilian think tank FGV Energia and is an active member of International Gas Union (IGU), having served in the executive committee and as the chair of the Task Force on Building Strategic Human Talent. She has made presentations at several energy conferences and training courses, most recently at the World Gas Conference, and she is a member of the programme committee of LNG 17. She is a regular columnist for the specialized magazine *Brasil Energia*. Ieda has a degree in chemical engineering from Universidade Federal da Bahia, an MSc in energy from Universidade de S.Paolo, and an MSc from Ecole Polytechnique Fédérale de Lausanne.

Elham Hassanzadeh, Visiting Research Fellow, joined the institute in 2012 as a research fellow and became a visiting fellow in 2014. She holds an LLB in judicial law from Azad Tehran University, an LLM in international commercial law from the University of Cambridge (where she was a Shell Centenary Scholar), and a PhD in oil and gas law from the Centre for Energy, Petroleum and Mineral Law and Policy (CEPMLP), University of Dundee. Her areas of expertise include petroleum contractual regimes in the Middle East and North Africa (MENA), the politics and economics of the Iranian oil and gas industry, and reform of energy subsidies in energy producing countries. Elham is a qualified barrister at the Iranian Central Bar Association, a visiting lecturer at Azad Tehran University, and a researcher for the World Bank on Iranian investment laws and

regulations. She is also a visiting fellow at the Global Subsidies Initiative (GSI) of the International Institute for Sustainable Development (IISD), where her work focuses on energy subsidies reform in developing countries.

Marianne Haug, Senior Research Adviser, teaches energy policy and sustainable development at the University of Hohenheim in Stuttgart, Germany and serves as a member of the HORIZON 2020 Advisory Group on Energy at the European Commission. Following a career at the World Bank in Washington DC (inter alia as director and senior adviser to the president), she served as director at the International Energy Agency (IEA) in Paris (2001–05), and as chairman of the board at the Forum für Zukunftsenergien in Berlin (2006–09). Her present research and advisory interests focus on the innovation dynamics and growth of clean energy within a rapidly changing global economy.

Charles Henderson CB, Senior Research Adviser, retired from the Department of Trade and Industry in 1996, where he was head of the energy directorate. He is a former chairman of Total's oil business in the UK (1998–2005) and former member of the Monopolies and Mergers Commission.

Cameron Hepburn, Research Associate, is an economist with expertise in energy, resources, and the environment. He is professor of environmental economics at the University of Oxford, based at the Smith School and the Institute for New Economic Thinking at the Oxford Martin School, a fellow at New College, Oxford, and is also professional research fellow at the Grantham Research Initiative at the London School of Economics.

Paul Horsnell, Research Associate, is head of commodities at Standard Chartered Plc. He was previously managing director and head of commodities research at Barclays Capital, joining in 2003 from his role as JPMorgan's head of energy research. Prior to that, he was assistant director for research at the OIES and a research fellow in economics at Lincoln College, Oxford University. He is the author of *Oil in Asia: Markets, Trading, Refining and Deregulation* (1997), and (with Robert Mabro) *Oil Markets and Prices: The Brent Market and the Formation of World Oil Prices* (1993). He holds a degree in philosophy, politics, and economics, and a doctorate in economics, both from Keble College, Oxford.

Siew Hua Seah, OIES-Saudi Aramco Fellow, is a postgraduate student at the School of African and Oriental Studies in London, pursuing an MSc in the political economy of development. While pursuing her master's degree, she is also working on a part-time basis with Argus Media in London as an LNG reporter. Prior to her move to London, she worked for six years with Argus in Singapore, where she covered a range of energy markets, including LNG, coal, bitumen, freight, and emissions. Before leaving Singapore to pursue her master's degree, she was the LNG editor responsible for the 'Argus LNG Daily' market report. Siew Hua also worked at the *Financial Times* in London as the recipient of the newspaper's Sander Thoenes Fellowship in 2005. She completed her undergraduate studies in political science at the National University of Singapore in 2004.

Anil Jain, Senior Visiting Research Fellow, is a member of the Indian Administrative Service of the Government of India. He has almost 30 years of administrative experience at the field and policy formulation levels, and has held senior positions in state and central governments. Between 2003 and 2008, as director and joint secretary in the Ministry of Petroleum and Natural Gas, he was closely involved with policy formulation and implementation on the upstream and downstream development of the Indian gas sector. He authored the book entitled *Natural Gas in India: Policy and Liberalisation*, published by OUP in 2012. As energy adviser to the NITI Aayog (formerly the Planning Commission of India), he advises on policy in the oil and gas, climate change, renewable energy, and energy efficiency sectors, and coordinates international cooperation. Jain also led the 'India Energy Security Scenarios, 2047', the medium-term energy outlook launched by the Indian government in 2014. Mr Jain, who co-chaired the energy related working group of the G20 in 2014, holds a BA in economics, an MBA, and a diploma from the Indian Institute of Foreign Trade.

Najeeb Jung, Research Associate, is the current *Lieutenant Governor of Delhi* of the *National Capital Territory of Delhi*. He joined the *Indian Administrative Service (IAS)* in 1973 and worked in *Madhya Pradesh* and with the *Indian* government. He was vice-chancellor of the *Jamia Millia Islamia*, a central university in *Delhi*. He subsequently worked with the *Asian Development Bank (ADB)*. He is an expert on governance and energy, having worked in these areas with different governments, the public sector, and the private sector. He is a member of several committees and special task forces set up by the Indian government to deal with education and governance. He is also a regular columnist for several national newspapers.

Yelena Kalyuzhnova, Senior Visiting Research Fellow, founded the Centre for Euro-Asian Studies at the University of Reading. Professor Kalyuzhnova is an expert on the economics of energy and transition economies and authored the first book in English about the economy of Kazakhstan. She is involved in collaborations on

a wide range of topics with a number of private companies, such as BG Group, Burren Energy, ChevronTexaco, and Shell International, as well as international organizations such as UNECE, the World Bank, the IMF, and the EBRD. She has contributed to numerous economic studies for international organizations, including the World Bank, EBRD, Economic Commission for Europe, and the United Nations. She is also a frequent speaker at the international level on economic, environmental, and energy issues. Within the UK government and parliament, Professor Kalyuzhnova served as an economic adviser on Caspian issues to Lord Fraser of Carmyllie in the House of Lords as well as the All-Party Parliamentary Group on Kazakhstan (2007–2010). She now serves as vice dean of Henley Business School, where she has obtained numerous research grants from a variety of sources to support field research, regular conferences, and numerous visiting researchers from Eurasian countries. Yelena is also a member of the Council of the British Institute of Energy Economics.

Aleksandar Kovacevic, Senior Visiting Research Fellow, started his professional career in 1986 with the Federal Productivity Institute of the former Yugoslavia, having graduated with a degree in energy economics from Belgrade University. He is principal author of the energy and poverty analysis *Stuck in the Past – Energy, Environment and Poverty in Serbia and Montenegro* (UNDP, 2004), and co-author of the Western Balkans energy policy survey (IEA/UNDP, 2008) and the *Public Expenditure and Institutional Review (PEIR) for Serbia and Montenegro* (World Bank, 2003). For over 20 years he has provided strategic advice, complex energy efficiency solutions, and emergency situation assistance to major institutional, financial, and private clients, including assistance to UN OCHA to coordinate rapid reconstruction of the Serbian energy infrastructure after the Kosovo War. He was affiliated to PlanEcon before 1992, was project manager for the Taganrog Development project in Russia (1992–98), and has been a contributor to the Black Sea and Central Asia panel at the Harriman Institute, Columbia University. Aleksandar is a member of the advisory board to the Russian Power Conference (since 2002) and of the UNECE Group of Experts on Sustainable Energy, as well as a regular consultant to the World Bank and contributor to the Oil and Gas Economy and Law (OGEL) network. He won an innovation award at the Power-Gen Europe Conference in 2002.

Chris Llewellyn Smith, Research Associate, is a theoretical physicist. He is currently director of energy research at the University of Oxford, president of the council of SESAME (Synchrotron-light for Experimental Science and its Applications in the Middle East), and adviser to the World Energy Council (UK). He has served as chairman of the council of ITER (2007–09) and of the Consultative Committee for Euratom on Fusion (2004–09), and was director of UKAEA Culham (2003–08), with responsibility for the UK's fusion programme and for operation of the Joint European Torus (JET). While at Culham, he developed and promoted the 'fast track' development of fusion energy. He was provost and president of University College London (1999–2002), director general of CERN (1994–8), and chairman of the University of Oxford's Department of Physics (1987–92). During his time as CERN director, the Large Hadron Collider (LHC) was approved and construction started.

After completing his doctorate at Oxford in 1967, he worked briefly in the Physical Institute of the Academy of Sciences in Moscow, before spending periods at CERN and the Stanford Linear Accelerator Center, after which he returned to Oxford in 1984. Chris Llewellyn Smith has written and spoken widely on science funding, international scientific collaboration, and energy issues. He has served on many advisory bodies nationally and internationally, including the UK Prime Minister's Advisory Council on Science and Technology (1989–92). His scientific contributions and leadership have been recognized by awards and honours in seven countries on three continents.

Cyril Lin, Research Associate, is founder and managing director of IFG Development Initiatives (IFGDI), an economics and corporate advisory consultancy specializing in transition and emerging market economies. He received his undergraduate and graduate training at MIT, Harvard University, and the University of Oxford. Until 2001, he was a lecturer in economics at the University of Oxford, director of the Centre for Modern Chinese Studies, and fellow in economics at St Antony's College. He is a member of the team of international economists formed by the China Economic Research and Advisory Programme (CERAP), a non-profit body providing economic policy research and advice for Chinese policymakers. In 2006, he initiated the establishment of the Cairncross Memorial Foundation, which aims to support international collaborative research between foreign and Chinese specialists concerning major Chinese public policy issues, including economics, energy, environment, governance, and the law.

Joan MacNaughton, Research Associate, is an influential figure in the energy and climate policy debate. She was director general of energy at the UK Department of Trade and Industry, overseeing the energy agenda during the UK presidency of the EU and leading work on the energy proposals agreed at the G8 Gleneagles Summit. She chairs the World Energy Trilemma for the World Energy Council, an annual assessment of

129 countries' energy policies. From 2004 to 2006, MacNaughton chaired the International Energy Agency. Between 2007 and 2012, she led Alstom's policy department and acted as global adviser on sustainable policies, and in 2012 was vice chair of the UN High Level Panel on the Clean Development Mechanism. MacNaughton is honorary fellow and past president of the Energy Institute, advisory board chair at the Energy Academy Europe International, an IETA fellow and former member of the IETA board, trustee of the Climate Group, director of the James Hutton Institute, and a member of Warwick University's council. She has served on numerous other academic, public and private sector boards, including the board of governors of the Argonne National Energy Laboratory, where she chaired the budget committee (expenditure \$800m) and co-chaired a strategic review of laboratory operations. She has lectured extensively on energy and climate policy and is an experienced moderator of high level discussions, for example the ministerial/CEO roundtables at the Clean Energy Ministerial (CEM), at the invitation of the US government.

John Mitchell, Research Associate, is also an associate research fellow at Chatham House and honorary fellow at the Centre for Energy, Petroleum and Mineral Law and Policy at the University of Dundee. In November 2007, he received a lifetime achievement award for research from Saudi Arabia's King Abdullah at the opening of the 3rd OPEC Summit in Riyadh. He retired in 1993 from British Petroleum, where he held roles including: special adviser to the managing directors, co-ordinator for BP's subsidiaries in the western hemisphere, and head of BP's Policy Review Unit. In 1976–77, he was an academic visitor in the Department of Economics at the University of Cambridge. Mitchell is the author of numerous reports and briefing papers, including: 'Structural Crisis in the Oil and Gas Industry' (*Energy Policy*, January 2014), 'Asia's Oil Supply: Risks and Pragmatic Remedies' (Chatham House, 2014), 'US Energy: the New Reality' (Chatham House, 2013), and 'What Next for the Oil and Gas Industry', with Valérie Marcel and Beth Mitchell (Chatham House, 2012). He has written three books: *The New Economy of Oil* (Earthscan/Chatham House, 2001); *The New Geopolitics of Energy* (Chatham House, 1996); and, as editor, *Companies in a World of Conflict* (Earthscan/Chatham House, 1998). He was a contributor to *States and Markets in Hydrocarbon Sectors* by Andrei Beyli (Palgrave Macmillan, 2015) and *Oil Titans* by Valérie Marcel (Brookings/Chatham House, 2006).

Mari Luomi, Research Associate and OIES-Saudi Aramco Fellow, is a thematic expert and writer at the International Institute for Sustainable Development Reporting Services. As well as sustainable development, her core areas of expertise are natural resource and environmental policy and politics, with a special focus on climate change policy in the Gulf Cooperation Council states and international climate politics. Her research currently focuses on the Gulf and Brazil. She holds a PhD in the politics of the Middle East from the University of Durham. From 2011 to 2013, she was research associate and a CIRS post-doctoral fellow at the Georgetown University School of Foreign Service in Qatar. From 2006 to 2010, she held various research positions at the Finnish Institute of International Affairs, on both the Middle East Project and the Research Programme on the International Politics of Natural Resources and the Environment. She has also worked as adviser and senior researcher for the government of Qatar on environmental governance and international climate politics.

Nelson Mojarro, OIES-Saudi Aramco Fellow, is a doctoral candidate at the Science and Technology Policy Research Unit (SPRU) of the University of Sussex, where he gained an MSc in industry and innovation analysis. He recently collaborated as a researcher with SPRU on a multinational 'Technological Foresight Project'. His research interests are related to energy transitions, innovation in energy companies, and the use of biofuels by oil firms, particularly in companies such as BP, Shell, Petrobras, and Pemex. He has presented his research in the UK, US, and in several international forums. He has worked in the Mexican Foreign Trade and Investment Office in Chicago as an international trade agent and business intelligence representative.

Luke Patey, Research Associate, is senior researcher at the Danish Institute for International Studies. He is author of *The New Kings of Crude: China, India, and the Global Struggle for Oil in Sudan and South Sudan* (Hurst Publishers, 2014) and co-editor (with Daniel Large) of *Sudan Looks East: China, India, and the Politics of Asian Alternatives* (James Currey, 2011). His articles have appeared in *African Affairs*, *Middle East Policy*, *Third World Quarterly*, and the *Journal of Modern African Studies*. He has also written for the *Financial Times*, *The Guardian*, *The Hindu*, and *VICE News*. He has been a visiting scholar at Peking University (Beijing), the Social Science Research Council (New York), and the Centre d'études et de recherches internationales (Paris).

Gulmira Rzayeva, Research Associate, joined the Oxford Institute for Energy Studies in 2013. She is a senior research fellow at the Center for Strategic Studies (SAM) under the President of the Republic of Azerbaijan and a contributing analyst for the Jamestown Foundation's *Eurasia Daily Monitor*. Her areas of expertise include the energy policy of Azerbaijan, Black Sea and Caspian region energy security, and Turkey's domestic natural gas market. Ms Rzayeva has published numerous articles and commentaries on Azerbaijan's gas strategy and the

'Southern Gas Corridor' initiative, and has previously worked at the Moscow Carnegie Center, as a visiting research fellow, and at the Aleksanteri Institute of the University of Helsinki. She has a BA in international relations from Baku Slavic University and an MA in global affairs from the University of Buckingham, UK.

Ivan Sandra, Research Associate, is CEO of Sierra Oil and Gas, a Mexican independent oil and gas company. Prior to becoming CEO of Sierra, Ivan held a number of leadership and technical positions, including senior partner at EY London, where he was responsible for global oil and gas in emerging markets, and president at Energy Intelligence. Until mid-2011, he was vice president of global strategy and business development at Statoil. He played an important role in Statoil's strategy re-set and in the origination of business development and M&A efforts worldwide. Prior to Statoil, he held other positions in industry, including: head of oil supply at OPEC, whom he represented at the UNECE Expert Group on Resource Classification at the UN in Geneva; vice president in the O&G investment banking team at Citigroup; associate vice president for oil and gas equities at Merrill Lynch; exploration geologist at BP; and commercial positions in Venezuela, Norway, and Egypt. He is also a member of the Oxford Energy Policy Club and co-founder, board member, and lecturer in strategy at the executive energy MBA program at Vienna's Wirtschaftsuniversität (WU). He was recently appointed as a trustee to the Energy Policy Research Foundation, Inc. (EPRINC) in Washington DC. He has published and contributed to a number of books and publications. Ivan holds a BSc in geology from Baylor University, an MSc and MBA from Edinburgh University, and attended the Berkeley Executive Leadership Program at the University of California at Berkeley.

Paul Segal, Research Associate, is senior lecturer in economics at the International Development Institute, King's College London. He works on economic development, the distribution of natural resource revenues, and the macroeconomics of resource-rich countries. In 2006, he completed his DPhil in economics at Nuffield College, Oxford, having previously been a consultant economist at the UNDP in New York, a research fellow at Harvard University, and a lecturer in economics at the University of Sussex. He has been a visiting scholar at the National Bureau of Economic Research in Cambridge, Massachusetts, and at the Centro de Investigación y Docencia Económicas in Mexico City.

Amrita Sen, Research Associate, holds an MPhil in economics from Cambridge University, a BSc in economics from the University of Warwick, and is pursuing a PhD at the School of Oriental and African Studies, University of London. She has over six years' experience covering commodities, specializing in energy, particularly oil, and she has also covered coal markets, freight markets, and investment flows into the commodity markets. Amrita formerly led the oil research team at Barclays Capital and is frequently cited in leading media outlets, including the *Financial Times*, Bloomberg, and CNBC. She is the chief oil analyst at Energy Aspects, a market analysis house.

Adnan Shihab-Eldin, Research Associate, is the director general of the Kuwait Foundation for the Advancement of Sciences (KFAS) and OPEC's former acting secretary general/director of research. He served earlier as director of the IAEA's Department of Technical Co-operation (Vienna), director of UNESCO's Regional Office for Science & Technology (Cairo), director general of the Kuwait Institute for Scientific Research, and vice rector of Kuwait University (Kuwait). Dr Shihab-Eldin serves as board member/adviser to many national and international institutions and corporations. He received a BSc in electrical engineering, and an MSc and PhD in nuclear engineering, all from the University of California at Berkeley. He has published extensively and is a regular invited speaker at many international and regional meetings, covering many fields, including: energy policy, economics, technology and the environment; oil markets; nuclear power; and the management and development of science & technology in developing countries.

Ian Skeet, Research Associate, is a consultant to the OIES and former editor of *Oxford Energy Forum*. Between 1953 and 1985 he worked for Shell, where he was in charge of government and international relations from 1975 to 1985. Widely travelled in the Middle East, his publications include *Oman and Muscat: End of an Era* and *OPEC: Twenty-Five Years of Prices and Politics*.

Robert Skinner, Research Associate, is a former director of OIES and has previously held roles as vice president of Oil Sands Total E&P Canada Ltd, director of the International Energy Agency's policy office, assistant deputy minister for energy commodities (Canadian Government), and senior vice president at Statoil Canada. He is an associate fellow of the Institute for Research on Public Policy in Montreal, energy research strategy adviser to the University of Calgary, and consults for industry, governments, and academic institutions in Canada and abroad through Kimacal Energy Strategies, his private consultancy based in Calgary.

Brian Songhurst, Research Associate, has an honours degree in chemical engineering from Imperial College London and is a fellow of the Institution of Chemical Engineers. He has 48 years of experience in the oil and gas industry, working for engineering contractors, operators, and specialist consultants. He is a past chairman of the Institution of Chemical Engineers Subject Oil & Natural Gas Group (SONG), which provides technical networking among its members to deliver best practices within the chemical engineering community. He has held senior positions in engineering, projects, and sales, and has led engineering and process design teams for gas processing, offshore oil & gas, refinery, and petrochemical facilities around the world. He is currently director of LNG for London-based consultancy ThyssenKrupp Uhde Energy and Power and manages a variety of LNG projects for both onshore and offshore (FLNG) applications. He was previously engineering manager with MW Kellogg, one of the world's leading LNG contractors, and facilities engineering manager with J Ray McDermott, one of the world's leading offshore contractors.

Paul Stevens, Research Associate, was educated as an economist and specialist on the Middle East at Cambridge and at SOAS. From 1973 to 1979, he taught at the American University of Beirut in Lebanon, interspersed with two years as an oil consultant. From 1979 to 1993, he lectured in economics at the University of Surrey, after which he became professor of petroleum policy and economics at the University of Dundee's Centre for Energy, Petroleum & Mineral Law & Policy (a chair created by BP), where he was appointed to an emeritus chair in January 2008. He has now joined, on a part-time basis, Chatham House in London as distinguished fellow. He has published extensively on energy economics, the international petroleum industry, economic development issues, and the political economy of the Gulf. He also works as a consultant for many companies and governments.

Philip Wright, Research Associate, is a fellow of the UK's Energy Institute and was formerly professor, then honorary professor, of energy policy and economics at the University of Sheffield. Over three decades, his research, publications, consultancy, and teaching have covered the gamut of energy industries and companies that operate in them. As well as contributing a critical perspective on the liberalization of gas and electricity industries, his work has also addressed the fiscal regime of UK oil and gas. His views and expertise have been sought by government organizations, international organizations, companies, trade unions, and universities in Europe and Latin America. Fluent in French and Spanish, he has been a visiting professor at the University of Montpellier 1 and at the University of Cartagena de Indias, Colombia. He is currently scientific director at the Observatorio del Caribe Colombiano in Cartagena de Indias, working in collaboration with Colombian regulators to improve the performance of the electricity supply in the nation's Caribbean region. This has included the development of a monitoring system to provide early warnings of problems which would delay the timely commissioning of new electricity network investment projects. Most recently, he and his colleague Carmen Ocampo have completed an evaluation of the impact of a government electricity subsidy designed to assist the very poorest of households in the Caribbean region of Colombia.

Yingying Wu, OIES-Saudi Aramco Fellow, is pursuing her PhD at the International Capital Market Association (ICMA) Centre, University of Reading, where she earned her MSc in international securities, investment, and banking. Prior to her master's degree, she worked as an intern with Taishan Capital in Beijing. Yingying Wu, whose research specialism lies in the commodity futures market, has had a research paper presented at events including the annual Global Finance Conference (where it won the 'Best Paper Award') and the Financial Management Association (FMA) annual conference. She has also co-written a chapter about the application of the Kalman filter in commodity futures modelling which is included in the 2013 book *Handbook of Research Methods and Applications in Empirical Finance*, edited by Bell, Brooks, and Prokopczuk.

Ian Wybrew-Bond, Senior Research Adviser. After a career at Shell, principally in its international natural gas business, Ian became a gas adviser to the OIES and co-edited and co-authored the publications *Gas to Europe*, with Robert Mabro (OUP, 1999), and *Natural Gas in Asia*, with Jonathan Stern (OUP, 2002). He was a non-executive director of Saipem and a senior associate with CERA for many years.

Accounts

STATEMENT OF FINANCIAL ACTIVITIES (INCORPORATING AN INCOME AND EXPENDITURE ACCOUNT)

For the Year Ended 31 December 2014

Independent Auditors Statement To The Members of Oxford Institute For Energy Studies

	Unrestricted funds £	Endowment funds £	31.12.14 Total funds £	31.12.13 Total funds £
INCOMING RESOURCES				
Incoming resources from generated funds		–		
Voluntary income	807,757	–	807,757	630,939
Incoming resources from charitable activities	629,810	–	629,810	716,672
Incoming resources from investments				
Corporate Bonds	23,650	–	23,650	35,300
Quoted Securities	147,064	–	147,064	132,504
International Bonds	12,456	–	12,456	2,032
Deposit account interest	132	–	132	185
Other incoming resources	5,500	–	5,500	5,500
Total incoming resources	1,626,369	–	1,626,369	1,523,132
RESOURCES EXPENDED				
Costs of generating funds				
Costs of generating voluntary income	31,889	–	31,889	18,145
Charitable activities				
Projects and publications	1,634,472	–	1,634,472	1,646,919
Governance costs	44,903	–	44,903	53,108
Total resources expended	1,711,264	–	1,711,264	1,718,172
NET INCOMING / (OUTGOING) RESOURCES	(84,895)	–	(84,895)	(195,040)
Realised gain/(losses) on investment assets	156,399	–	156,399	271,839
Net income/(expenditure)	71,504	–	71,504	76,799
Unrealised gains/losses on investment assets	(9,268)	(13,504)	(22,772)	442,337
Net movement in funds	62,236	(13,504)	48,732	519,136
RECONCILIATION OF FUNDS				
Total funds brought forward	2,745,237	3,545,970	6,291,207	5,772,071
TOTAL FUNDS CARRIED FORWARD	2,807,473	3,532,466	6,339,939	6,291,207
CONTINUING OPERATIONS				

All incoming resources and resources expended arise from continuing activities.

OXFORD INSTITUTE FOR ENERGY STUDIES
(REGISTERED NUMBER: 01676971)

Balance sheet

At 31 December 2014

	Notes	Unrestricted funds £	Endowment funds £	31.12.14 Total funds £	31.12.13 Total funds £
FIXED ASSETS					
Tangible assets		14,463	–	14,463	27,790
Investments		2,432,426	3,532,466	5,964,892	5,976,455
		<u>2,446,889</u>	<u>3,532,466</u>	<u>5,979,355</u>	<u>6,004,245</u>
CURRENT ASSETS					
Debtors		10,141	–	10,141	6,443
Prepayments and accrued income		234,985	–	234,985	225,605
Cash at bank and in hand		190,948	–	190,948	154,270
		<u>436,074</u>	<u>–</u>	<u>436,074</u>	<u>386,318</u>
CREDITORS					
Amounts falling due within one year		<u>(75,490)</u>	<u>–</u>	<u>(75,490)</u>	<u>(99,356)</u>
NET CURRENT ASSETS		<u>360,584</u>	<u>–</u>	<u>360,584</u>	<u>286,962</u>
TOTAL ASSETS LESS CURRENT LIABILITIES		<u>2,807,473</u>	<u>3,532,466</u>	<u>6,339,939</u>	<u>6,291,207</u>
NET ASSETS		<u>2,807,473</u>	<u>3,532,466</u>	<u>6,339,939</u>	<u>6,291,207</u>
FUNDS					
Unrestricted funds				2,807,473	2,745,237
Endowment funds				3,532,466	3,545,970
TOTAL FUNDS				<u>6,339,939</u>	<u>6,291,207</u>

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The OIES is registered as a company limited by guarantee (without share capital). It is also a registered charity that operates as a non-profit educational organization. It is conceived as an association of various Members, who may be divided into two groups. On the one hand are the University of Oxford and three of its colleges; on the other hand is a selection of governments, public institutions, and international and regional organizations, from oil-producing and oil-consuming countries. With the exception of the university and its colleges, each Member has made a once-and-for-all financial contribution. These sums are treated as an endowment, providing for the long-term security of the OIES. All Members of the Institute have the following rights:

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Exxon	Texaco
Kuwait Petroleum International	Veba Oel AG
Mobil	

Sponsors of the Gas Development in LDCs Study (1986)

Arab Banking Corporation	Gaz de France
British Gas/UK Department of Energy	OPEC Fund
British Petroleum	Petro-Canada
Dubai Aluminium	Ruhrgas
Elf Aquitaine	Shell International
ENI/AGIP	Statoil
European Union	US Department of Energy
Exxon	World Bank
Foster Wheeler	

Sponsors of the North Sea Study (1984)

Amerada Hess	Mobil
Apicorp	OPEC Secretariat
British Petroleum	Pemex
Britoil	Petromin
Elf Aquitaine	Qatar General Petroleum Corporation
Esso Europe	Royal Ministry of Petroleum and Energy, Norway
European Union	Shell Oil (USA)

Shell UK
Statoil
Sun

Svenska Petroleum
UK Department of Energy
Veba Oel AG

Grants

Arab Fund for Economic and Social Development
Barrows
Bahrain Monetary Agency
Burmah Petroleum Fuels Ltd
European Union
ESRC
GCC
ICAP Energy
Institute of Energy Economics, Japan
Mr Ali Jaidah
The Kuwait Foundation for the
Advancement of Sciences

Kuwait Petroleum International
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Henderson, J and Ferguson, A. ‘International Partnership in Russia: Conclusions from the Russian Oil and Gas Industry’, Palgrave Macmillan, 2014.

Keay, M. ‘Demand and Energy Security’ in *New Challenges in Energy Security*, Mitchell C, Watson J, and Whiting J, Palgrave Macmillan, 2014.

Keay, M. 'Electricity Markets and Pricing for the Distributed Generation Era' in *Distributed Generation and its Implications for the Utility Industry*, (ed.) Sioshansi F.P., Elsevier, 2014.

Stern, J. 'International Gas Pricing in Europe and Asia: A Crisis of Fundamentals', *Energy Policy* (64/2014) Special Section: Oil and Gas Perspectives in the 21st Century, pp.43–48.

