



ANNUAL REPORT 2011



THE OXFORD
INSTITUTE
FOR ENERGY
STUDIES

A RECOGNIZED INDEPENDENT CENTRE OF THE UNIVERSITY OF OXFORD



Oxford Institute for Energy Studies



Annual Report 2011

About the Oxford Institute for Energy Studies

The Oxford Institute for Energy Studies (OIES), a Recognized Independent Centre 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 Institute 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 Institute 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. This international character is also reflected in the composition of the research team. Such cooperation is intended to lead to more informed assumptions concerning the behaviour, motivations, and objectives of the various agents operating in 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 Institute 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

In November of 2012 the OIES will celebrate its thirtieth anniversary. Over this period it has benefitted from a stable institutional environment that allowed it to evolve productively and build its reputation in energy studies, focusing on policy and applied research. The Institute has maintained strong links with industry, governments, and multilateral organizations, and has developed into a platform that provides context to major energy issues, identifies global and regional trends, and performs analysis in these areas. It disseminates its work through its own publications, its two sister organizations – the Oxford Energy Seminar and the Oxford Energy Policy Club, as well as the publications of its staff and their interaction with industry and other stakeholders. Since the Institute was established it has sustained a strong commitment to deepening the dialogue on energy issues between consumers and producers, governments and industry, the academic community and decision makers. As a recognized independent centre of Oxford University it seeks to capture the benefits of its links to the University and to its Member Colleges – Nuffield, St. Antony's, and St. Catherine's. The Institute also hopes to bring to the Oxford academic community a better understanding of relevant and pressing energy sector issues.

Anniversaries like this one can be a good moment to review the Institute's accomplishments and, more importantly, to reflect on its future. This exercise should help us identify new issues and problems in the energy field that should be researched. It would also allow us to adapt to new circumstances and build on our past success. Our central interests will continue to be in the oil and natural gas industries, given their expected importance

in the next thirty years and more. However, we must have the flexibility to understand their development more fully in the context of growing environmental and social concerns, as the imperatives of a lower carbon global economy will drive energy policy in new directions and develop cleaner sources of energy. Although the Institute's basic approach to energy issues has been distinctly global, it has focused on specific regions and countries to enrich overall views. Over the years, producing countries with large resource endowments have been of particular interest and they will continue to be a key object of its research effort. However, oil markets, in spite of temporary segmentations, are global in nature. The extent of natural gas markets has been more limited, but LNG and long-distance pipelines are reducing its fragmentation. These characteristics explain the approach that was taken.

The establishment, development, and management of the Institute have not been easy tasks. They required imagination, an enduring commitment, and a clear sense of purpose. Its success has been highly dependent on two individuals, with their own specific skill sets and relationships. Robert Mabro was its founder and long-time Director and Christopher Allsopp its Director since 2005. We are deeply indebted to them.

Jonathan Stern's contribution deserves special mention. He set up and headed the natural gas research programme as its Director. A significant number of timely books, articles, and working papers attest to the productivity of this programme, as well as the strong team he formed and the important network of industry participants that he structured. He has now been ably succeeded by Howard Rogers. Bassam Fattouh, the Director of the Oil and the

Middle East Programme, has rapidly built a reputation through his work on the international oil pricing system and has written well-regarded articles that have appeared in academic journals, in books published by the Institute, and in a series of working papers. He is actively involved in networking in oil-producing countries, especially in the Gulf and North Africa, and in both the Oxford Energy Seminar and the Oxford Energy Policy Club.

In the last few years the staff of the Institute has been growing as a result of the recruitment effort led by Christopher Allsopp. The number of research fellows and visiting research fellows, as well as external research advisers, has increased gradually as part of our mid-term objective of doubling the size of the Institute. Further growth will necessarily require additional support and funding from our benefactors. At the same time the Director has managed with the same dedicated administrative staff. These developments bode well for the future of the Institute as it reaches its thirtieth year.

Adrián Lajous
Chairman of the Board

Director's Report

The main objectives of the OIES are to undertake advanced research on energy issues of global relevance. As an educational charity, the Institute is committed to the dissemination of the results of research as widely as possible, both in academia and in the world at large. The Institute's research in 2011 continued to examine the economics, the politics, and the sociology of energy with a focus on oil and natural gas. Its research spanned the international relations between producers and consumers of energy, the economic development of producing nations, and the geopolitical aspects of all these issues, alongside the economics and politics of the environment in relation to energy, including climate change.

Developments during the year 2011 illustrate the interactions between international developments and global energy markets. The global economy, after the optimism of the recovery year 2010, slowed in 2011, especially in OECD countries. However, geopolitical worries, especially surrounding the effects of the Arab Spring, worked in the opposite way, supporting oil prices, and in the first half of 2012 the price of Brent crude rose to a peak of \$127 (in March), reflecting also worries over developments in Iran. (The subsequent fall was associated with the developing crisis in the Euro area.) For the year 2011 as a whole, the average price of oil was about \$105. By contrast, prices of natural gas diverged. The shale gas revolution in the USA led to very low domestic prices, as well as the release of increased supplies of LNG for other areas of the world. One consequence was an increasing disequilibrium between long-term contract prices and spot prices on the developing European hubs. The Fukushima disaster in March 2011 affected not only international gas markets, but also markedly altered prospects for nuclear power generation around the world.

Recruitment and staff

There has been very little turnover of research staff. Lavan Mahadeva joined the OIES as a Senior Research Fellow in August 2011. He leads macroeconomic research at the Institute, his research focuses on the interaction of energy markets with the macroeconomy and international finance. We welcomed back Juan Carlos Boué, whose current research concerns the governance mechanisms and legal structure underpinning the international oil industry. Amongst other projects, he will be working in the priority area of the energy sector in Brazil. Professor Sir Chris Llewellyn-Smith and Dr Ali Aissaoui were appointed Senior Research Advisers. Altogether, over 40 researchers are listed in this Report – many of whom are part time. The mix reflects the Institute's policy of recruiting both experienced researchers, many with a background in industry, as well as academics from a variety of social science backgrounds.

Priorities for recruitment include further appointments relating to oil, and to the economics and geopolitics of the Middle East as well as China and India.

Relations with the University

The formal position of the OIES in relation to Oxford University is as a Recognized Independent Centre (RIC). This status was established in 2007 and has been running now for a number of years. Generally, the new relationship (which replaced the old status of an Associated Institute) has been working well. Oversight is provided by the University's Joint Committee for the Coordination of Independent Research Centres. Not surprisingly, however, as noted last year, there are still a number of areas where the relationship between the University and the RICs could be improved. The Institute's work is becoming better understood and appreciated within the University (particularly since the appointment of Sir Chris Llewellyn

Smith as the University's Director for Energy Research), though it is probably still true that OIES is better known outside than inside Oxford.

Last year's Report referred to the Report by the University's Joint Committee for the coordination of Independent Research Centres (it was OIES's turn to be assessed in 2010), noting that the procedures had proved to be extremely useful and helpful in improving understanding on all sides. The Report was formally discussed by the OIES board in November 2011. One issue that was highlighted was that the formal and informal relationships between the Institute and Oxford University were extremely important (and likely to become more so) in the recruiting and retention of senior staff, and that they would be particularly important in the future when the time came to recruit and appoint a new Director.

Activities and research in 2011

As indicated in this Report, three books were published during 2011. Katja Yafimava's *The Transit Dimension of EU Energy and Security: Russian gas transit across Ukraine, Belarus, and Moldova* is the first book to provide an in-depth analysis of market, legal/regulatory, and energy security aspects of the transit of Russian gas to Europe across western CIS countries – Ukraine, Belarus, and Moldova – to Europe. The book on *Natural Gas Markets in the Middle East and North Africa*, edited by Jonathan Stern and Bassam Fattouh, was the product of successful collaboration between the Gas Programme and the Oil and the Middle East Programme of the OIES. It provides a comprehensive analysis of market prospects in countries with 40 per cent of the world's proven gas reserves. The book on *UK Energy Policy and the End of Market Fundamentalism* was edited by Ian Rutledge and Philip Wright. Two other books are in preparation and are well-advanced for publication in 2012. In *Sino-Russian Oil and Gas Cooperation*, Keun-Wook Paik explores the many aspects of the new Sino-Russian relationship connected

with the countries' respective oil and gas sectors. It is based on Dr Paik's unrivalled knowledge gained from 25 years specializing in this subject. The second is a multi-authored project exploring the pricing of internationally traded gas. This is another book which will be the first of its kind in its field. Twenty Working Papers were published during the year (on a very wide range of topics) as well as numerous Comments.

A programme of seminar/workshops, with invited participants, focusing on issues relating to oil markets was instituted in 2009. The 2011 'Oil Day' focused on the regulation of oil markets. We are very grateful for support for this event from the two main exchanges, ICE and CME Group (formerly Nymex). Plans for the 2012 'Oil Day' are well underway. It is intended that the discussions will focus on the outlook for Brazilian oil, as well as on the international repercussions of the expected build-up of production.

During 2011, Jonathan Stern gave up the Directorship of the Natural Gas Programme, handing over that role to Howard Rogers in October. Jonathan Stern is now Chairman of the Natural Gas Programme and Senior Research Fellow of the OIES. The change in roles, which gives Jonathan Stern more time for his own research and writing, was supported by the Sponsors. Meanwhile, the Natural Gas Programme continues to go from strength to strength. The regular sponsors meetings and the 'Gas Day' were all highly successful. Membership is expanding – to the point where the programme is now essentially at capacity.

The Institute's cross-cutting programmes on India and China continue to move forward. A working paper on 'Oil Revenues and Economic Development: The Case of Rajasthan, India' by Anupama Sen and Paul Segal was published in 2011. Another working paper 'Natural Gas in India: An Analysis of Policy' by Anil K. Jain and Anupama Sen was also published

in 2011 – in advance of publication (in early 2012) of Anil K Jain's book *Natural Gas in India: Liberalisation and Policy*. Generally, the Institute's visibility and reputation within India is improving rapidly. The China programme is, as noted in previous Reports, still in need of additional funding, but OIES's visibility and links with China have been transformed over the last few years.

The Institute's annual 'Brainstorming' was held in Nice in early June. We are extremely grateful to Schlumberger for generous support for this successful occasion.

The Institute continues its successful programme of internal seminars. These are proving invaluable in bringing together the various different strands of research, and fostering academic interactions within the Institute. The Lecture series on the geopolitics of energy, held jointly with St Antony's College, continues to bring distinguished speakers to Oxford and to attract large audiences.

General

As a research institute, OIES depends greatly on the continuing dedication of its administrative staff, Kate Teasdale, Susan Millar, Margaret Ko, Lavinia Brandon, and Jo Illott. We are very grateful for the way in which they foster the relaxed but productive research atmosphere which is one of the main characteristics of OIES. The interactive and networking aspects of the Institute's research also benefit greatly from the close relationship with the two sister institutions, the Oxford Energy Policy Club and the Oxford Energy Seminar. From a wider perspective, the OIES 'model' also depends crucially on the increasingly close and productive relationships that have been built up with its members, benefactors, sponsors, and friends. It is these linkages that allow a relatively small Institute to develop its global reach and reputation. These relationships will become even more important

as the Institute widens its scope and expands over the next few years.

Christopher Allsopp
Director

Research

Environmental Attitudes and Impacts on Local Content Policy Formation in Kazakhstan

In this project Yelena Kalyuzhnova analyses state–civil society interaction and policy accountability in Kazakhstan. Specifically, the project examines how environmental attitudes across different state–civil society segments are articulated and enacted in the local content policy formation process. A comparative institutional analysis is utilized to test theories of natural resource rent extraction and circulation, and their relationship to environmental and local content policies. Population surveys and key actor interviews are conducted to provide objective specific data. The environment–local content focus aims to combine a number of external and internal policy factors and will reveal additional generalizable insights into state–civil society interaction in Kazakhstan.

Kazakhstan's Oil Fund and its Role in the 2007–9 Financial Crisis

Sovereign Wealth Funds (SWF) have different titles, goals, and rules, but they share the underlying objective of helping governments deal with the problems created by large and variable revenues (mainly from energy or other commodity-related sectors). In Kazakhstan, such a fund (the National Fund of the Republic of Kazakhstan (NFRK)) was established in 2000. This fund operates as both a stabilization and a savings fund. The first test for the NFRK was the 2007–9 financial crisis, where the NFRK 'saved' the economy and guaranteed its speedy recovery. Yelena Kalyuzhnova analyses the NFRK's operation up to 2007 and during the crisis years 2007–9, before drawing conclusions and implications for the future. She

observes that history has created significant challenges for the future.

An Anatomy of the Crude Oil Pricing System

The main purpose of this report by Bassam Fattouh is to analyse the main features of the current crude oil pricing system; to describe the structure of the main benchmarks currently used, namely Brent West Texas Intermediate (WTI) and Dubai–Oman; to clearly identify the various financial layers that have emerged around these physical benchmarks; to analyse the links between the different financial layers and between the financial layers and the physical benchmarks; and then to evaluate how these links influence the price discovery and oil price formation process in the crude oil market. The report finds the assumption that the process of identifying the price of benchmarks in the current oil pricing system can be isolated from financial layers to be rather simplistic. The different layers of the oil market are highly interconnected and form a complex web of links, all of which play a role in the price discovery process. The report also calls for broadening the empirical research to include the trading strategies of physical players; any analysis limited to non-commercial participants in the futures market and their role in the oil price formation process is incomplete. The report also emphasizes the distinction between trade in price differentials and trade in price levels, and finds that the level of the oil price which consumers, producers, and their governments are most concerned with is not the most relevant feature in the current pricing system. Instead, the identification of price differentials and the adjustments in these differentials in the various layers underlie the basis of the current oil pricing system.

Uncertainty, Expectations, and Fundamentals: Whatever Happened to Long-Term Oil Prices?

One of the major features of the oil market during the 1990s was the relative stability of the long-term oil price. While the spot price and the price of near-term futures contracts sometimes exhibited sharp price volatility, that volatility was only partially transmitted to the back end of the futures curve, which was anchored around the \$20–22/barrel range. However, as oil prices rose sharply during the boom years, the consensus on the oil price that would balance the long-term fundamentals of the oil market broke down, and the whole futures curve became subject to a series of shifts. Empirical evidence suggests that in the late 1990s and early 2000s there was limited evidence of adjustment between short-term and long-term oil prices. These dynamics, however, changed in early 2005 with the long-term price making most of the adjustment towards the prompt price. In this report, Bassam Fattouh suggests an interpretation of the long-term behaviour of oil prices, based on the insights of two models. The first is based on a signal extraction mechanism and shows that when the private beliefs by investors about the long-run determinants of oil prices become less precise relative to the information contained in the current spot price, then the expected future oil price becomes closer to the current spot price. The second model is based on Bayesian updating and shows that if the variability of the spot price increases and/or if the spot price remains higher over a sustained period of time than anticipated by investors, then the probability distribution of the parameter capturing the speed of mean reversion will shift and the expected future price will move closer to the current spot price. The paper's analysis predicts that in the face of increased uncertainty the long-term and short-term prices are bound to exhibit similar movements. These changes have

important consequences on the oil price formation process. A paper based on this report and co-authored by Bassam Fattouh and Pasquale Scaramozzino was also published in a special issue of *Oxford Review of Economic Policy*, Volume 27, Issue 1, Spring 2011.

The Oil Trading Markets, 2003–10: Analysis of Market Behaviour and Possible Policy Responses

In this working paper, Adair Turner, Jon Farrimond, and Jonathan Hill consider price movements in the oil trading markets between 2003 and 2010, and provide an analysis of factors which potentially explain the significant trends in this period. The authors also discuss the impact of different forms of oil price volatility, and propose that the type which matters most from an economic standpoint is that of medium-term price trends. The authors then discuss possible public policy actions that could be employed to prevent or mitigate such trends, with the paper concluding that proposals solely related to the operation of the financial markets will not address the fundamental drivers of instability. The final version of this working paper was also published in *Oxford Review of Economic Policy*, Volume 27, Issue 1, Spring 2011.

Oil and International Energy

This article, co-authored by Christopher Allsopp and Bassam Fattouh, focuses on issues surrounding international oil markets within the wider context of international energy, the global economy, and conflicting agendas such as energy security and climate change. It is suggested that important aspects of the current situation appear 'unsustainable' – increasing uncertainty and methodological difficulties for any assessment of likely future developments. It is argued that the dynamics of oil prices during the 2002–9 cycle reflected great uncertainty

about future ‘fundamentals’ as well as the absence of previously anticipated stabilizing feedbacks from supply, from demand, or from policy. It is suggested that damaging oil-price swings could be moderated by better policy, though probably not by financial regulation. In the longer term, the uncertainties remain very great, especially since the tensions between a realist view of likely energy-market developments and the imperatives of the climate change agenda remain unresolved. A wide range of policies in producer and consumer countries are likely to affect not only oil prices but also the contentious issue of the distribution of rents within the industry. The article was published in a special issue of *Oxford Review of Economic Policy*, Volume 27, Issue 1, Spring 2011.

Oil Price Shocks and the Macroeconomy

Paul Segal examines the impact of oil price shocks and attempts to explain why the rise in oil prices up to 2008 had little impact on the world economy. The paper argues that the effect of oil prices on macroeconomic outcomes can only be understood in the context of broader macroeconomic policy, and monetary policy in particular. Oil price rises do not cause recessions per se, but rather, when oil price rises lead to inflation, then monetary authorities tend to raise interest rates in response, thereby reducing output. The fact that oil price rises have tended not to pass through to inflation in more recent years explains why their impact on aggregate output has also declined. The paper was published in a special issue of *Oxford Review of Economic Policy*, Volume 27, Issue 1, Spring 2011, co-edited by Christopher Allsopp and Bassam Fattouh.

Asymmetric Adjustments in Oil and Metals Markets

Using the threshold co-integration methods, Enders–Siklos (2001) and Hansen–Seo (2002), this study finds that spot and futures prices in each of the four widely traded commodities

– copper, gold, WTI oil, and silver – are asymmetrically co-integrated. However, the asymmetric adjustment to the long-run equilibrium differs among those commodities, reflecting different profitable opportunities. The adjustment is faster for copper after positive shocks, while it is faster for the safe havens oil, gold, and silver after negative shocks. It is more the spot and not the futures price for the four commodities that focuses in its adjustment on long-run factors. In sum, the adjustments imply different trading strategies, depending on whether the faster adjustment happened from above or below the threshold. The article was published in *The Energy Journal*, 31(4): 183–204, 2010 (with S. Hammoudeh, L.H. Chen, and Bassam Fattouh).

How to Spend It: Resource Wealth and the Distribution of Resource Revenues

Natural resource revenues differ from other government revenues both in their time profile, and in their political and legal status: they are volatile and exhaustible, and belong to all citizens of the country in which they are located. In this paper, Paul Segal examines the expenditure of resource revenues in detail, considering existing practices in resource-rich countries, their implications, and alternatives. It considers both the distributional impact and the efficiency of alternative policies, focusing on the extent to which they succeed in providing all citizens with their share of the benefits due to natural resources. It also shows how, by dropping the assumption of a representative agent, a concern for poverty and social welfare more generally interacts with, and alters, standard recommendations for the intertemporal management of resource revenues. This work was published as a research paper by the LSE Kuwait Programme on Development, Governance and Globalisation in the Gulf States in October 2011 and is now undergoing revisions for the journal *Energy Policy*.

Twenty Years of Producer–Consumer Dialogue in a Changing World

From its humble beginnings in Paris in 1991 the global producer–consumer dialogue on energy has developed through the International Energy Forum (IEF) so that it is now the world’s largest gathering of Energy Ministers. IEF Countries account for more than 90 per cent of global oil and gas supply and demand. In addition to IEA and OPEC countries, transit states and key energy players, including Brazil, China, India, Mexico, Russia, and South Africa, participate in the Forum. The magnitude and diversity of this engagement is a testament to the IEF’s position as a neutral facilitator. Through the Forum and its associated events, IEF Ministers, their officials, energy industry executives, and other experts engage in a dialogue of increasing importance to global energy security. The twists, turns, and developments of the 20 year history of the dialogue are documented in this publication, co-authored by Bassam Fattouh and Coby van der Linde.

Dynamics of Global Oil Demand: Implications for Middle East Producers

The wide uncertainty surrounding oil market dynamics in the aftermath of the financial crisis did not prevent many market analysts from making bold predictions that market fundamentals are likely to tighten in the near future. These predictions are based on the combination of three factors: a very limited growth in non-OPEC supply; a slowdown in investment in OPEC countries; and a rapid growth in global oil demand fuelled mainly by non-OECD economies. This paper focuses on one element underlying the current predictions of tight oil market fundamentals: global oil demand dynamics. It provides a general overview of the current corpus of knowledge concerning the

determinants of oil demand, both in the short run and in the long run, focusing on some key relationships that are important to understanding the dynamics of global oil demand, and explores some of the underlying causes for the divergent projections by the various organizations. It then draws some policy lessons for Middle East oil producers. This chapter, authored by Bassam Fattouh, was published in *The Oil Era: Emerging Challenges*, Abu Dhabi: The Emirates Centre for Strategic Studies and Research.

Anatomy of an Oil-Based Welfare State: Rent Distribution in Kuwait

This paper on the distribution of oil rents in Kuwait, written by Laura El-Katiri, Bassam Fattouh, and Paul Segal, was completed in 2010 and published as an LSE Kuwait Programme research paper in January 2011; and in a shortened form as a chapter in David Held and Kristian Ulrichsen (eds.), *The Transformation of the Gulf: Politics, Economics and the Global Order*, Routledge in October 2011. The paper explores the relationship between oil wealth, oil rents, and governmental distributive policies in the context of Kuwait. Oil has created a wealthy and relatively egalitarian economy based on an extensive distributive system that provides Kuwaiti citizens with essential services including free healthcare, education, and social security. The most important fact about Kuwait’s oil wealth, therefore, is that it has been successfully used to benefit its citizens. This feat has been achieved through a broad distributive welfare state. Nevertheless, Kuwait’s policies of rent distribution have developed in an ad hoc manner into an uncoordinated system. Some of Kuwait’s policies of rent distribution – such as subsidizing utilities and providing public employment – have resulted in substantial distortions, inefficiencies, and institutional deficiencies and the paper argues that there remains substantial scope for improvement. The paper has been

extremely well received and has been linked with a number of public lectures given by the authors on their research.

The Implications of the Arab Uprisings for Oil and Gas Markets

The events that took place in the Arab world in the opening months of 2011 mark a watershed in the history of the Middle East and North Africa (MENA) region. Given the importance of MENA energy supplies in global economic terms, the political unrest witnessed by the region has caused widespread fears about the prospect of energy supply disruptions. With international oil and gas prices beginning to rise from 2010, there was serious concern among market and political actors that any further increase in prices would put at risk the fragile recovery of the global economy from the deepest recession in decades. This paper by Hakim Darbouche and Bassam Fattouh examines the significance of the recent Arab uprisings and their implications for regional and global oil and gas markets. It argues that, although markets were able to cope resiliently in the short term, there remains much uncertainty about the likely longer-term implications of the recent events.

Energy Poverty in the Arab World

While much of the emphasis of the literature on energy poverty is on the prevalence of the phenomenon in sub-Saharan Africa and South Asia, little has been written about energy poverty in the Arab world. Traditionally having been seen as one of the world's most energy-rich regions, the Arab world has in recent years often been overlooked as a region which suffers severely from energy poverty itself. In 2002, about 65 million people in the Arab world had no access to electricity, and an additional 60 million were severely undersupplied in both urban and rural areas. In terms of cooking and heating, almost one-fifth of the Arab population rely on non-commercial fuels like

wood, dung, and agricultural residues particularly in Comoros, Djibouti, Sudan, Yemen, and Somalia but also in Algeria, Egypt, Morocco, and Syria. This study by Laura El-Katiri and Bassam Fattouh fills a gap in the existing literature by looking at the case of prevailing energy poverty in Yemen, one of the poorest countries in the Arab world. The Yemeni case is particularly interesting because of the country's status as a net energy exporter. Large segments of the Yemeni population, both in rural and urban areas, rely heavily on traditional fuels such as firewood and dung while electrification rates in Yemen are relatively low, only 54 per cent of Yemeni households having access to electricity. Decades of underinvestment and lack of necessary infrastructure, and Yemen's prevailing poverty problem have all contributed to this status, as has the country's fractured political system.

Energy Subsidies in the Arab World

The policy of maintaining tight control of domestic energy prices has characterized the political and economic environment in most Arab countries, together with many other parts of the world, for decades. The objectives behind such a policy range from overall welfare objectives such as expanding energy access and protecting poor households' incomes; to economic development objectives such as fostering industrial growth and smoothing domestic consumption; and to political considerations, including the distribution of oil and natural gas rents in resource-rich countries. While energy subsidies may be seen as achieving some of a country's objectives, this paper argues they are a costly and inefficient way of doing so. Energy subsidies distort price signals, with serious implications on efficiency and the optimal allocation of resources. Energy subsidies also tend to be regressive, with high-income households and industries benefiting proportionately most from low energy prices. However, despite such adverse effects, energy subsidies constitute

an important social safety net for the poor in many parts of the Arab world, and any attempts to reduce or eliminate them in the absence of compensatory programmes would lead to a decline in households' welfare and erode the competitiveness of certain industries. Therefore, a critical factor for successful reforms will be the ability of governments to compensate their populations for the reduction or removal of subsidies through carefully designed mitigation measures that protect the poorest and assist the economy in its long-term adaptation. The paper argues that a reform of energy pricing mechanisms in the Arab world may be seen as beneficial from more than one perspective. Nevertheless, the authors recognize that the current political climate in the region will render the reform of domestic energy prices difficult in practice, such that reform may indeed be a medium- to long-term endeavour. The paper was written by Bassam Fattouh and Laura El-Katiri for the UNDP as part of the organization's Arab Human Development Report Research Paper Series and was published in February 2012.

The Distribution of Oil Revenues in Mexico

Paul Segal's paper "El Pétroleo es Nuestro": The Distribution of Oil Revenues in Mexico' was published by the James A. Baker III Institute for Public Policy, Rice University, Houston, Texas, as part of a joint project in collaboration with Lawrence Whitehead. The paper was presented at a major conference in Mexico in 2011. It analyses the distributive impact of fiscal policy in Mexico in the context of its substantial oil revenues. Dr Segal finds that while Mexico's fiscal system appears progressive, in the sense that the poor receive more in benefits from the fiscal system than they pay in taxes, a closer analysis reveals that official figures imply that all but the richest 10 per cent of citizens receive less from the fiscal system than their share of oil revenues. The net effect of fiscal policy, therefore, is to transfer entitlements

to oil revenues to the richest 10 per cent, from everyone else. In this sense the fiscal system is highly regressive.

The Strategic Implications of Russia's Eastern Oil Resources

This working paper by James Henderson, published in March 2011, outlines the renewed focus on the oil sector in Eastern Russia, with a particular focus on those resources which are likely to fill the new East Siberia Pacific Ocean pipeline. Russian oil exports have historically been focused on western markets, with the country's huge trunk pipelines taking all the crude not used in domestic refineries from Siberia into the heart of Europe, or to Russia's Baltic or Black Sea coasts for onward transport into the global oil markets. However, Russia's position in European and other western markets has now matured to a level where further expansion will be difficult to achieve, and as a result the rapid growth of the Asia-Pacific economies, and in particular China, over the past two decades has led to a re-focusing of Russia's strategic and energy interests. This paper therefore examines the renewed enthusiasm for investment in oil resources in east Siberia and the Far East. The key catalyst required to encourage increased activity in this sector has always been considered to be the construction of pipeline infrastructure to allow any oil from new fields to be moved to market, and the Russian State has now provided this incentive via its wholly owned transport company Transneft, which opened the East Siberia Pacific Ocean pipeline in December 2009. This pipeline not only provides a link to Russia's Pacific coast, but as of January 2011 also provided a direct link to the world's fastest growing oil market, China. This paper examines the strategic importance of this new pipeline route, both in terms of Russia's relations with China, and also in the context of the impact of newly emerging Russian crude on the

Asia-Pacific oil market. In particular it focuses on the ability of Russia to increase production from its eastern regions to fill the full capacity of the ESPO, and examines the plans of all the companies involved in the development of licences and fields from Krasnoyarsk in the west to Sakhalin Island in the east, looking in detail at the specific assets that will provide the bulk of Russia's oil exports to eastern markets. The paper also discusses the fiscal incentives that the Russian State is starting to provide in order to encourage companies to make the long-term investment decisions needed to develop oil fields in the region, and also provides estimates, by company, of the potential amount and timing of oil production that could possibly emerge as a result. Its overall conclusion is that the potential exists for Russia's eastern territories to produce sufficient oil to balance the gradual decline expected in the west of the country, thereby allowing the Russian oil industry to meet the government's overall target for production in 2030 of around 10 mmbpd.

The Battle for Russian Oil: Corporations, Regions and the State

This book, by Shamil Midkhatovich Yenikeeff, to be published by the Oxford University Press in 2012, deals with the politics of the Russian oil industry from 1991 to the present day. Within this twenty-year period, fierce battles emerged over who controls Russia's oil industry: the Kremlin, Russian regional governors, or the oligarchs? These clashes determined the course of development for Russia's oil sector, and have shaped the evolution of Russia's political system, from the collapse of the Soviet Union to the present day.

The book explores four themes: The first theme presents a story of the expanded influence of regional governors over Russia's internal politics and economy in the 1990s. As a

result, fledgling domestic oil companies experienced considerable constraints on their business activities within a semi-disintegrated Russian state. The second theme examines the economic and political strategies deployed by these companies to achieve corporate consolidation over Russia's oil sector in the late 1990s–early 2000s. During this period, oligarchs succeeded not only in undermining the grip of regional governors on the domestic oil industry, but also in emerging as a new political threat to the Kremlin. The third theme, then, focuses on the Kremlin's re-assertion of state control over the national oil sector, and the declining political power of governors and oligarchs in Russia in the 2000s. Finally, the book reveals how the Kremlin elite, resource-rich regions, and oil companies view the future of the domestic oil industry and its role in the modernization of Russia.

Sino-Russian Oil and Gas Cooperation

Keun-Wook Paik's book project *Sino-Russian Oil and Gas Cooperation: The Reality and Implications* covers the ups and downs of oil and gas relationships between two energy giants during the period 1993–2010. This project reviews the status of the oil and gas industry in China and in the Asian part of Russia. China has already developed its first west–east gas pipeline and the second is being constructed. Russia has completed the first stage of the East Siberia Pacific Ocean (ESPO) crude oil pipeline. Massive lending has recently finalized the long-delayed decision on the spur pipeline from the ESPO line. In this context, Sino-Russian oil cooperation is on the right track. However, there is no sign of a breakthrough in the gas price negotiations between Russia and China (even though Gazprom argues the final price agreement will be settled by 2011) and this continued delay will help the expansion of LNG supply to the coastal areas of China. This study also reviews factors such as oil and gas supply from the Central Asian Republics, China's massive foreign reserves, and

Russia's gas exports to Korea – which will have a serious effect on Sino-Russian oil and gas cooperation.

Oil Revenues and Economic Development: the Case of Rajasthan, India

In 2004 a large discovery of oil was made in Rajasthan, a relatively poor state in north-west India. Oil began to flow in 2009. The estimated total hydrocarbons resource base in Rajasthan is 6.5 billion barrels, and the fields are estimated to have the potential to reach output levels of over 200,000 barrels of oil per day. The quantities of oil that are expected to be produced, and their resulting revenues, are significant, but unlikely to be transformative to the state's finances. However, given low levels of economic and human development, effectively-spent resource revenues could have a significant impact on the welfare of Rajasthan's citizens. In this paper, Paul Segal and Anupama Sen discuss options for the use and management of oil revenues in Rajasthan, picking up the challenge from the point at which revenues start to flow to the government. The receipt and expenditure of oil revenues are matters for fiscal policy, and they are considered here in the context of India's federal system, where fiscal responsibility is divided between the federal government and state governments. Drawing on international experience, the authors discuss how resource revenues are spent in practice, and how they might better be used to benefit the citizens who ultimately own them. The authors argue that smoothing fiscal expenditures, including oil revenues, is likely to be wise, but saving oil revenues abroad using international financial markets is likely to be less beneficial than using them to complement existing social policies in the state, or investing domestically. They demonstrate how oil revenues could be used to target poverty reduction through supplementing rural employment generation programmes in the state,

or to provide a universal pension that would eliminate old age poverty.

The Economics of Energy in India

Anupama Sen's research focuses on the economics of energy in India. India's economy has been growing at an average of 8 per cent in the last few years. Although India is primarily a 'coal economy', rapid growth has led to growth and diversification in energy use in the last few years, including efforts to encourage exploration for hydrocarbons within India, and to increase the use of non-conventional energy sources. Despite this, per capita energy consumption is very poor, at about 30 per cent of the world average, and nearly a quarter of the population lack access to any form of modern commercial energy. Factors that have contributed to this include, first, capacity constraints that have restricted diversification, despite early signs of an impending shortage in power. Second, there are physical and regulatory constraints in distributional infrastructure, including grid connectivity and pipeline networks, restricting the substitution of energy sources. Third, there are distortions in pricing, at two 'points'; prices paid by marketing/distribution companies to exploration companies, and prices paid by energy users to marketing/distribution companies, both of which were until recently set well below costs, and were sustained through policies that are untenable in the long run. The problems in India's energy sector relate to its wider transition from a planned to a market-oriented economy. Policy changes in energy pricing during 2011, particularly in oil and gas, have pushed the focus of the problem further into downstream consuming sectors.

Dr Sen's research has covered aspects of these main issues. In 'Diversity in Unity: An Empirical Analysis of the Economic Effects of Electricity Deregulation in Indian States' an econometric analysis using an 'index' to measure electricity reform was conducted for Indian states, taking

into account India's political economy and regional diversity. It explored the effects of a 'generic' model of reform on key economic variables, including prices and investment flows. Results showed that actual outcomes were counterintuitive to expected outcomes, mainly because of the levels of distortions, primarily in pricing, that existed prior to implementing reform. Outcomes therefore tended to be negative with the implementation of reform, but stabilized at a 'baseline' level on the reform index. This paper was accepted for publication in 2011 in *The Energy Journal*, a leading journal in the field of energy economics.

'Natural Gas in India: An Analysis of Policy' (joint with Anil Jain) a Working Paper published in April 2011, analysed India's policy on natural gas. It identified two areas of policy that are likely to influence the future role of the gas sector: specific aspects of the fiscal regime in exploration and production, and pricing in the main downstream gas consuming sectors. This paper then broke down and analysed policy on pricing in downstream sectors, suggesting options to help the transition towards market-oriented functioning, whilst ensuring the provision of basic goods which use gas as an input in manufacturing, to the poorest sections of the population. It drew from experience in the liberalization of oil prices in India and the replacement of input subsidies with a direct transfer to eligible consumers. In 'Oil Revenues and Economic Development: The Case of Rajasthan, India' (joint with Paul Segal) published as a Working Paper in June 2011, policy options for the use of oil revenues in an Indian state were explored, in relation to India's fiscal regime for hydrocarbons, its system of fiscal federalism, and levels of economic development. This paper was based on a presentation made to officials from the State Government of Rajasthan on options for the use and management of resource revenues from oil production. In the second half of 2011, Dr Sen began working on a paper investigating India's fiscal regime for hydrocarbons exploration. This paper

analyses the Indian fiscal regime in three broad categories; first, it looks at the relationship between the fiscal terms offered and outcomes, in terms of progress in exploration. Second, it considers the system of auctioning (a simultaneous sealed bid auction with one round) by examining data on the participation of bidders, the terms bid, and the information asymmetries that exist between NOCs, domestic private companies, and international oil companies. Finally, it considers exogenous factors in determining the results of the auctioning rounds and of exploration outcomes.

Natural Gas in India: an Analysis of Policy

In 2010, the Indian government increased the price of 'administered' gas to more than double its previous level, in a significant policy change. This move, whilst appearing to signal a reduction in distortions on one side of the policy equation (that is, the price paid to gas producers by marketing and retailing companies), highlights distortions on the other side (the complex subsidy regime for prices paid by some gas users to retailers), essentially pushing the focus onto downstream consuming sectors. This paper, by Anil Jain and Anupama Sen, argues that the transition in the gas sector is part of the larger movement of the economy from a centrally planned and administered system to one based on market principles. During transition, the situation cannot be understood simply in terms of the conventional paradigm of demand and supply being brought into balance by price. Demand and supply are influenced by different factors, but have been kept broadly in balance by the complex system of administered pricing and quantitative allocation. The resulting distortions have been spread across the gas consuming sectors – notably power and fertilizers. As distortions mount, parts of the system are modified, usually in the broad direction of liberalization and reform. But partial reform often has the effect of displacing the problems,

presenting further challenges, and requiring further changes. Large changes in the pricing and allocation of gas cannot therefore occur without finding other ways of addressing distributional objectives. This paper argues that official forecasts of demand and supply, although optimistic, are based on a 'planner's outlook', and a better assessment of the role of gas may be found in the price competitiveness of gas with alternative fuels in its main consuming sectors. It draws from experience in the oil sector – where prices were liberalized in 2010 for all but the poorest segments of consumers – thus in gas, the paper argues that there is a case for considering market prices in the gas sector, and providing the subsidy directly to the end-user in the fertilizer sector, where the distributional concerns appear most significant. The paper argues that although reforms are taking place, the current situation is essentially a half-way house, and it suggests ways forward from this through the resolution of specific problems on the supply and demand sides. This paper is to be published as a book by OIES in 2012.

The Impact of Import Dependency and Wind Generation on UK Gas Demand and Security of Supply to 2025

For most of the past decade the UK gas market has been the largest in Europe, and gas has been the most important fuel in the country's energy balance. For these reasons alone, the future of UK gas supply and demand should be considered as extremely important issues by a range of energy stakeholders. Most of the White Papers, roadmaps, and scenarios published over the past decade, setting ever more challenging targets for carbon reduction over the next several decades, suggest that UK gas demand will start to decline during the 2010s and fall away rapidly thereafter. Those concerned about security of gas supply, which is routinely equated

with increasing exposure to regional and global markets and prices via increasing import dependence, have greeted such conclusions with approval. In this view, dependence on gas is seen as a major problem which will be remedied by the introduction of low-carbon energy sources.

This paper by Howard Rogers, published in August 2011, is the first independent attempt to address both of these questions within a framework which takes empirical account of both regional and global gas markets, and the introduction of increasing amounts of intermittent wind generation in the UK power sector. The results of Howard Rogers' empirical modelling challenge the assumption that as a result of substantial increases in renewable generation capacity, the role of gas will decline rapidly over the next decade and beyond. The study suggests that the importance of gas for power generation will remain undiminished until 2025. Although its role may change, gas is likely to be particularly important in respect of ensuring security of supply in the context of increasing wind generation capacity and intermittent generation output. It is not the role of the OIES gas research programme to promote natural gas, either in the UK or more generally. However, our research increasingly suggests that the likely future role of gas in energy balances has been, and continues to be, underestimated in a range of countries including, somewhat surprisingly given its long gas history, the UK.

Economic recession and natural gas demand in Europe: what happened in 2008–2010?

This paper, by Anouk Honoré, published in January 2011, was a companion piece to her book *European Natural Gas Demand, Supply, and Pricing: Cycles, Seasons, and the Impact of LNG Price Arbitrage*. It offers a statistical update on gas demand since the book was finished, explaining the impacts of

both economic recession and recovery, and the cold temperatures in winters 2008/9 and 2009/10. The main text provides some concise analysis on gas demand trends and the main sectors of consumption. The appendices give additional statistical details by country.

The main conclusions were: 1/ Natural gas demand in Europe will recover progressively, but not necessarily faster than expected, although cold temperatures at the beginning and the end of 2010 will have boosted gas demand; and 2/ Although the impact of cold temperatures should not be confused with underlying recovery, signs of economic improvement and, as a consequence, signs of a slow recovery of gas demand in 2010, enhanced by temperature effects, is the overall picture.

Security of Gas Supply in South Eastern Europe: Potential Contribution of Planned Pipelines, LNG, and Storage

This research, by Anastasios Giamouridis and Spiros Paleoyannis, published in July 2011, focuses on the gas markets of south-eastern Europe, which were those most directly affected (in terms of consumers who actually lost their gas, power, or heat supply) by the Russia–Ukraine crisis of January 2009. While these countries represent a small percentage of European gas demand, this is outweighed by the importance of ensuring that their future gas supplies can be assured through a mix of diversified pipeline and LNG supplies, new interconnections, storage, and efficiency measures.

One of the challenges in undertaking this research in the wake of the European recession of 2008/9 was that a combination of reduced energy demand and financial crisis had rendered future gas and energy demand prospects, as well as financial capacity to support large-scale capital investments, particularly uncertain

for many countries in this region. However, the small-scale demand of these countries also provides them with opportunities to consider similarly sized supply diversification and demand management solutions. While multi-billion Euro pipelines bringing 10–30 Bcm/year of Caspian gas to and through the region have tended to dominate the headlines, smaller-scale solutions such as interconnectors with reverse flow, floating LNG regasification facilities, and additional storage could provide more immediate and affordable solutions.

Elusive Potential: Natural Gas Consumption in the CIS and the Quest for Efficiency

Most publications on CIS gas focus on supply and trade issues, but with consumption greater than any geographical region other than North America, CIS gas demand is an important and much neglected research issue. Lack of public domain data, and major differences between published sources (Russian and western), possibly relating to definitions and/or measurement, means that discovery and selection of historical data is a large part of the research task. Accordingly, much of this paper is focused on trying to establish a statistical basis from which analysis can proceed, along with identification of gaps in data, disagreements between different sources, and the extent to which reconciliation is possible.

Given the fact that when the Soviet Union broke up it was one of the least efficient economies on the planet, the generalization, for the two post-Soviet decades, that conservation and efficiency measures should yield huge energy and gas savings, has been uncontroversial. The problem is that the actual results have been modest both in absolute terms and certainly in relation to theoretical potential. Simon Pirani's study investigates the reasons for this relative failure and what may need to happen to produce greater success in future.

This is the most recent paper on CIS gas issues from the OIES Natural Gas Research Programme following Simon Pirani's edited book covering the entire region, Simon's subsequent paper on the impact of economic recession and financial crisis, and papers on various gas contracts and crises between Russia and western CIS countries. It is the first piece of research to focus on the detail of gas demand, a hugely important part of the complex matrix of CIS gas issues which forms an important part of the global gas picture. This study was published in July 2011.

The Spanish Gas Market: Demand Trends Post Recession and Consequences for the Industry

In this paper, published in August 2011, Anouk Honoré argues that the outlook for the Spanish gas market needs to be completely reassessed as a result of the impact of recession and the rapid increase in renewable (mainly wind) energy and hydropower. Utilization levels of CCGTs fell significantly post-2008, and there is uncertainty whether they will recover in future. With a significantly greater proportion of LNG supplies in total gas demand than most other countries, this means that Spanish companies must find markets for surplus LNG for the next several years.

From the late 1990s up to 2008 the Spanish gas market grew at double digit rates every year; these growth rates had been expected to continue until the mid 2010s. This study on Spain, which uses similar bottom-up methodology to that set out in Dr Honoré's book *European Natural Gas Demand, Supply, and Pricing: Cycles, Seasons, and the Impact of LNG Price Arbitrage*, takes a closer look at what has changed post-2008. The Spanish gas market has potential lessons for many other European countries, in particular the over-contracting of gas supplies as a consequence of previous (much higher) demand projections.

The Transition to Hub-Based Gas Pricing in Continental Europe

In this research, published in March 2011, Jonathan Stern and Howard Rogers argue that Continental European gas markets are moving inexorably from oil-linked to hub-based pricing. Market prices for gas increasingly reflect a complex combination of national, regional, and global supply and demand for gas rather than oil products. An increasingly competitive European gas market, created by third party access enforced by a combination of EU and national regulations, means that any supplier refusing to supply gas at hub prices will lose customers. The commercial risk for utilities which are importing gas at oil-linked prices under long-term contracts but forced to sell at market prices has become untenable. The European gas industry is in the early stages of a commercial paradigm shift away from oil-linked and towards hub-based pricing. This is likely to be accompanied by major changes in contractual arrangements, including termination of many existing long-term contracts probably involving significant litigation.

Does Natural Gas Need a Decarbonization Strategy? The Cases of the Netherlands and the UK

The proposition that natural gas could be a 'transition fuel' has been frequently used in previous years by the gas industry when addressing the future outlook of gas. The main arguments are its (relatively) low emissions compared to other fossil fuels, high efficiency in power generation, and the ability to accommodate intermittent renewable capacity. The term transition fuel implies a certain end date, depending on the timeframe of this transition. The proposition of being a 'destination fuel' could give natural gas an even stronger foothold in future energy supply.

However, are these propositions supported by verifiable developments around gas and government policies? In other words, how viable or credible are these claims for a long-term role for gas? This research by Floris van Foreest, published in May 2011, examines the viability and credibility of these propositions in relation to two of Europe's biggest gas markets: the UK and the Netherlands. One conclusion is that the gas industry has yet to convince other energy industry stakeholders and analysts. Although many in the sector believe that the gas industry has a good story to tell in relation to its future in a low-carbon economy, its public pronouncements are filled with assertions about the advantages of gas but an absence of commitments to decarbonize and little recognition of the importance of such commitments.

The Pricing Debate over Russian Gas Exports to China

Russian pipeline gas exports to China have been one of the most anticipated global gas trades since the end of the cold war. There have been many suggested projects, many meetings of presidents and prime ministers, and many false dawns, but so far agreement has proved elusive. The difference, as we enter the 2010s, is that this bilateral trade has potential significance far beyond the borders of the countries themselves. The longer it takes these two countries to agree on the terms for bilateral gas trade, the greater the likelihood that China will opt to import larger volumes of central Asian pipeline gas and Pacific Basin LNG.

The major stumbling block to Sino-Russian gas trade has seemed, over the past five years, to be disagreement over pricing. But James Henderson's paper, published in September 2011, suggests that, while this is certainly a significant issue, there are other fundamental disagreements between the countries, notably involving the initial source of the gas to be exported, the question of loans for development, and equity ownership of gas and infrastructure.

This paper provides an excellent summary of recent history and is an immensely useful guide to the issues which will determine how these negotiations may unfold, hopefully to a successful conclusion, in the future. Should negotiations fail, or be delayed for several more years, this could have significant consequences for the availability of gas in Eurasia and the Pacific region, and therefore this paper has significant relevance for gas markets beyond these two countries.

Domestic Gas Prices in Russia – Towards Export Netback?

The announcement in 2006 that Russian domestic gas prices would be raised to European netback levels by 2011 caused much excitement both within and outside Russia. The reality has been less dramatic, but as Jim Henderson ably demonstrates, this is partly because of completely unforeseen developments in European gas pricing, largely driven by higher oil price levels than anyone believed possible five years previously.

Continued liberalization of the gas market and gas pricing in Russia – even if this takes another ten years to complete – will have significant consequences for Russian exports to Europe (and potentially elsewhere). As Europeans contemplate significant changes to their own method of gas pricing, changes in the same direction in the Russian gas market (albeit on a longer time scale) could create new and different linkages between the markets.

As this paper, published in November 2011, argues persuasively, depending on the evolution of pricing in the different markets, Europe could find itself in competition for gas supplies with the Russian domestic and CIS markets. These issues will increasingly demand attention in both Russia and Europe, perhaps as much attention as the political and strategic aspects of the subject which have for so long dominated public discourse.

The Transit Dimension of EU Energy Security: Russian Gas Transit Across Ukraine, Belarus, and Moldova

This book by Katja Yafimava was published by Oxford University Press in November 2011. Discussion of the role of Russian energy and natural gas supplies in European markets has generated a substantial body of work by academics, policy makers, journalists, and bloggers which gathered pace after the 2006 Russia–Ukraine gas crisis and reached a crescendo in the wake of the January 2009 crisis.

This is the first book to provide an in-depth analysis of both the attempts of the EU markets to diversify supplies to reduce dependence on Russian gas, and the legal and regulatory aspects of energy supply and transit, given the contractual rights and obligations of the parties involved. This extremely complex set of issues became increasingly important during the 2000s. No other work has combined this breadth of scope with a similar depth of research on the transit countries and their contractual gas and transportation relationships with Russia, utilizing such a wide range of original source material in all of the languages of the region.

For these reasons, this is the most important study thus far published for anyone wishing to understand the full range of issues – economic, political, contractual, legal, and regulatory – behind the problems of the transit of Russian gas to Europe during the 2000s.

The Outlook for U.S. Gas Prices in 2020: Henry Hub at \$3 or \$10 ?

The international relevance of Henry Hub prices was already recognized in early 2007 when Michelle Foss wrote her first paper for the Gas Programme on North American gas

prices. That paper, written before the unconventional gas revolution had become conventional wisdom, when Henry Hub prices were well above \$6/mmbtu and had recently been in the \$10–15/mmbtu range, suggested that a reasonable expectation of a price range during the period up to 2015 would be \$3–6/mmbtu. This was greeted with considerable scepticism at a time when large numbers of regasification terminals were under construction in preparation for imports of high-priced LNG, but has thus far proved to be absolutely correct. As a result, only a fraction of the LNG destined for those terminals has been delivered.

In 2011, conventional wisdom, as expressed by the US Energy Information Administration, is that Henry Hub Prices will stay at around \$4/mmbtu at least for the rest of this decade and not rise significantly above \$6/mmbtu until around 2030. Yet how likely is this to be correct? Is it really the case that the costs of shale gas production, and of the production of associated gas from shale oil, will remain at such low levels for a considerable period of time? And if so, might there be a market response, both in terms of increased domestic demand and a plethora of US LNG export terminals? These are the questions addressed in this paper.

The relevance of Henry Hub prices for gas stakeholders worldwide means that the need for research and informed opinion is more important than ever. Over the past two decades, the North American gas developments have surprised us many times, and are likely to continue to do so in the future. The substance of this working paper, published in December 2011, will form one of the chapters in the forthcoming book *The Pricing of Internationally Traded Gas* to be published by the Gas Programme in the second half of 2012.

The Impact of a Globalizing Market on Future European Gas Supply and Pricing: The Importance of Asian Demand and North American Supply

The shale revolution in North America, the economic recession in Europe, the Arab Spring, and the Fukushima nuclear incident in Japan provide examples of events which have had impacts on gas supply, demand, and pricing far beyond their immediate geographical regions. While this clearly demonstrates an increasing 'connectedness', the current stage of development of international gas trade cannot be compared with the global oil market. This said, the increasing 'globalization' of gas – the fact that European gas stakeholders need to pay increasing attention to what is happening in both North America and Asia – marks a new phase in the development of natural gas which our research needs to take into account.

This study, by Howard Rogers, uses the model and methodology developed in his previous studies to analyse different scenarios of North American gas production and Asian demand over the next 15 years, showing how these could create fundamentally different outcomes for European supply, demand, and pricing. This highlights the relative parochialism of much European gas commentary which, over the past decade, has concentrated on security issues relatively narrowly defined as dependence on Russian gas supplies. This study also examines the impact on Russian gas supply and pricing to Europe, of different scenario outcomes in North America and Asia, showing that Gazprom may also have to make uncomfortable choices between volume and pricing of European exports over the next decade

The innovative aspect of the research, published in January 2012, is that it shows that in a globalizing gas market, Europeans need to pay as much attention to what is happening in gas markets elsewhere in the world as

they do to their own regional supply, demand, and pricing dynamics.

Natural Gas Price Volatility in the UK and North America

Sofya Alterman made contact with the Natural Gas Research Programme in 2010 while undertaking a project on LNG as part of her Harvard MBA. This working paper on natural gas price volatility is the result of her subsequent research at the OIES during July and August 2011.

Lacking a commonly understood definition, volatility is an often over-generalized term with different meanings to different constituencies. This should not detract from the importance of volatility. To traders volatility is a source of revenue, to energy-intensive industrial end-users it is often perceived as a threat. Midstream utilities actively work to manage volatility in order to deliver a 'dampened' price offer to end-user customers.

In this working paper, published in February 2012, Sofya summarizes the insights from an analysis of natural gas, crude oil, and oil products price time series to answer the questions 'are natural gas prices inherently more volatile than those of oil?' and the more challenging question 'can episodes of markedly different gas price volatility be explained by underlying market fundamentals?' Sofya's research involved a painstaking analysis of 14 years-worth of daily price data, along with the investigation of the likely drivers of the volatility patterns uncovered. Her results both confirm the relevance of obvious drivers, but also show how these can be blunted or offset by other compensating effects, some of which are less widely acknowledged. This research is particularly timely as trading hub development continues apace in continental Europe.

Will There be a Shale Gas Revolution in China by 2020 ?

With continued strong growth in Chinese demand for gas expected for the foreseeable future, China will continue to focus on attracting pipeline gas and LNG imports, but also on developing its domestic natural gas resources. A 2011 EIA survey assessed China's shale gas resource potential to be larger than that of the USA. This being the case, it could reasonably be anticipated that China would emerge as a significant shale gas producer.

This research by Fan Gao, to be published in April 2012, suggests that such expectations could be premature. China's experience in developing its vast coal bed methane (CBM) potential over the past few decades have been disappointing, partly due to a lack of investment in resource assessment, but also due to a lack of enthusiasm by coal and hydrocarbon-producing Chinese NOC's for whom CBM was viewed as a 'non-core' business. The unwillingness to provide an appropriate participation framework to attract and apply international technology and know-how is also identified as a key failing.

The early stages of Chinese shale gas exploitation appear to highlight similar problems. A role for IOC's and US independents appears to be confined to joint studies and technology exchange, with little indication of an incentivized long-term investment framework. China's policy of encouraging smaller domestic companies to transition into a successful dynamic shale gas producing sector is currently hampered by a lack of resource evaluation, a slow pace of acreage award, and a lack of financial capability on the part of the companies themselves. The upstream service sector, which played a key role in the US shale gas story, is not characterized in China by dynamic competition and innovation. Starting from this position, with an apparent strong desire to 're-create a US shale boom without direct transfer of technology and know-how' China's

shale gas revolution is likely to take much longer than expected and is unlikely to be accomplished by 2020.

Shale: The Unfolding Story

In the early 2000s US gas production was in slow but steady decline despite increasing drilling activity. As US natural gas prices rose in response to the resulting tight market, the only supply-side solution appeared to lie in the development of liquefied natural gas (LNG) projects in the Middle East and Africa for importation to the North American market. Almost unnoticed in its early stages, the US shale gas phenomenon gathered momentum from 2004 onwards through the combination and application of two proven technologies, namely horizontal drilling and pressure-induced hydraulic fracturing or 'fracking'. The pioneers of this approach were not the majors but the much smaller, domestically focused 'independent' upstream companies who, together with a well-established and adaptable service sector, instigated what is now commonly referred to as the 'shale gas boom' and which has increased US natural gas production to the point where only minimal imports of LNG are expected to be required for the foreseeable future. This paper by Howard Rogers, published in *Oxford Review of Economic Policy*, Volume 27, Issue 1, Spring 2011, looks at the genesis of the US shale gas industry, the intensive nature of its operations, and the factors which have underpinned its success to date. It also addresses the question of whether similar developments might be expected in Europe and what specific challenges would need to be overcome. In a world where increased LNG supply has created trade flow and price linkages between regional gas markets, the paper also examines the impact US shale production has had on other markets through the re-direction of LNG originally intended for the US market.

Natural Gas Markets in the Middle East and North Africa

This book was published in March 2011. It is the first academic book in any language to provide a comprehensive analysis on the gas supply, demand, and trade prospects for the Middle East and North Africa region, which accounts for 40 per cent of the world's proven gas reserves. The main conclusion of the book is that the majority of the countries are encountering increasingly serious problems in meeting increasing domestic gas demand, mainly for power generation but also for new petrochemical projects. Despite huge reserves, countries are struggling to cope with demand growth of 6–7 per cent per annum, partly resulting from very low domestic prices – which are one-third to one-sixth of the cost of new domestic production, and an even smaller fraction of the price of internationally traded gas.

This situation is causing countries, including those which have traditionally been exporters, to import pipeline gas and LNG. Middle East and North African countries urgently need to raise domestic gas prices to at least cost-based and eventually to internationally traded levels, a task which would have been extremely difficult even prior to the recent political upheavals in the region, but which now seems beyond either existing or new governments. Failure to increase prices will either cause subsidies (and hence financial deficits) to increase to unmanageable levels or a future of increasingly serious power shortages.

The only exception to these general trends will be Qatar, already the largest LNG exporter in the world, but where growth potential beyond current projects is uncertain. Saudi Arabia may continue its current policy of no imports/no exports, but only at the expense of increasing use of oil in power generation. Algerian exports will continue to grow slowly but will peak before the end of this decade.

Iraq and Israel could become modest exporters of gas but (aside from Qatar) the general outlook for exports from the region is relatively bleak.

This multi-author book was edited by Bassam Fattouh and Jonathan Stern. The authors of the chapters are: 'Algeria's Natural Gas Market', Hakim Darbouche; 'The Libyan Gas Industry', Waniss A. Otman; 'The Role of Natural Gas in North African Transit Countries', Waniss A. Otman and Hakim Darbouche; 'Egypt's Natural Gas Market', Hakim Darbouche and Robert Mabro; 'The Mashreq, Israel, and the Palestinian Territories', Andrew Cleary; 'The Saudi Gas Sector and its Role in Industrialization', Bassam Fattouh; 'Natural Gas in Iraq', Lorian Yacoub and Ian Rutledge; 'The Iranian Gas Industry', Siamak Adibi and Fereidun Fesharaki; 'Qatar's Gas Revolution', Justin Dargin; 'LNG in Qatar', Andy Flower; 'Natural Gas in Oman', David Ledesma; 'The UAE Gas Sector', Justin Dargin and Andy Flower; 'Natural Gas in Bahrain and Kuwait', Randa Alami; 'Natural Gas – A Lifeline for Yemen', Franz Gerner and Silvana Tordo; and 'Conclusion', Bassam Fattouh and Jonathan Stern.

Algeria's shifting gas export strategy: Between policy and market constraints

Given the importance of Algeria as a supplier of gas and LNG to Europe, there is a surprising lack of accessible research on the country's industry and prospects. This research by Hakim Darbouche, published in March 2011, analyses the main drivers of Algeria's gas export strategy since the early 2000s. It argues that, after suffering a series of setbacks owing to the policy inconsistencies of the administration of former energy minister Chakib Khelil, Algeria's gas export strategy now faces a number of constraints as a result of changing market conditions. The situation inherited by the new leadership at Sonatrach and the Algerian energy ministry leaves limited options for the optimization

of Algeria's gas exports in the short- to medium-term. Up to about 2014, the maximization of the value of available exports is highly likely to take precedence over the preservation of market share, while large parts of the country's gas export infrastructure will be under-utilized for most of the 2010s. To address this situation, decision makers in Algeria will have to take meaningful action to improve the gas supply–demand balance.

International Gas Markets

Despite generalizations to the contrary, there is as yet no 'global natural gas market', but as regional markets become more interconnected, natural gas can be said to be 'globalizing'. This chapter in *A Technical and Legal Guide to the Global Hydrocarbons Markets*, published by Stronachs in 2011, looks at the following regions: North America, Europe, Russia and CIS, Middle East and North Africa, some of the major Asian countries; and at international LNG developments. The aim, when tackling these huge subjects, has been to focus on their likely impact on international gas trade. The aim of the chapter is to give the reader some insight into the main gas issues of most of the major regions but also the problems of expanding LNG and pipeline gas trade on an increasingly global basis. This chapter is a multi-author work from the staff of the Natural Gas Research Programme at the OIES. Jonathan Stern wrote the introduction, Asian section, conclusions, and was responsible for overall editing of the chapter. The authors of the other sections are: Florence Gény – North America, Anouk Honoré – Europe, Simon Pirani – Russia and CIS, Hakim Darbouche – Middle East and North Africa, Howard Rogers – LNG developments.

Profit margins in energy supply

During 2011 John Rhys had the opportunity to work with the Institute for Public Policy Research, advising them on how to gather

and interpret information on the subject of electricity and gas prices, markets, and margins. This work is shortly to be published by IPPR and it is likely that John will prepare an OIES Comment on their research at that time. The subject continues to be a controversial one, but is also relevant to broader considerations of power sector structure and regulation discussed below in the context of EMR.

The GCC Regional Electricity Market

The GCC countries have experienced tremendous economic growth over the past decade as a result of high windfall revenues from their oil and natural gas exports. At the same time, the region's own energy consumption, including that of electricity, has risen fast, leading to various capacity bottlenecks in the short term, with recurrent electricity outages along the Gulf coast for consecutive summers at times of peak demand. In this context, it has been noteworthy that one of the GCC's most recent mega-projects, the GCC Interconnection Grid, went online in July 2009 with its first phase. The GCC Grid is aimed at enabling the opening of a regional market for electricity, with various potential benefits for GCC electricity supply security, as well as economic benefits. In this paper, Laura El-Katiri tried answering the question of to what extent intra-GCC electricity trading could potentially be part of a mid- to long-term solution for the GCC states in increasing their electricity sectors' supply security as well as their market efficiency. She concludes that potential for commercial trade in electricity between the GCC states does exist, but various features of national electricity markets in the GCC mean this potential is likely to materialize only in the long term. Until then, the GCC Grid remains an expensive but strategically useful piece of infrastructure, which may one day form the backbone of a more integrated, regional market.

Electricity market reform

Electricity market reform (EMR) continues to be a major issue for UK government in seeking to implement the decarbonization of the power sector by the substitution of alternative forms of electricity generation to replace fossil fuel burning, which is itself the central plank of UK policy to mitigate climate change with ambitious medium- and long-term emissions reduction targets. It is controversial largely because it signals the need for major changes to the liberalized market framework introduced in the UK in 1990, hitherto widely regarded as an exemplar for the structure and regulation of the industry. John Rhys has previously worked to influence the Committee on Climate Change, *inter alia*, on this subject and to demonstrate the potential weaknesses of current market structures and the alternative approaches that might be adopted. This has included submission of comments, *inter alia*, to DECC and other consultations on this subject. Its scope implicitly includes issues associated with the EU emissions trading scheme, as well as general issues of how a future power sector will operate, and the nature of domestic demand. This research is now leading on to examination, with Malcolm Keay and David Robinson, of how current EMR proposals might be implemented and some of the alternatives that might be proposed. Its importance extends well beyond the UK, since many other countries will be facing very similar issues, and the UK's policies will be watched very closely.

Domestic electricity demand

John Rhys continues to devote some research time to looking at aspects of energy storage and domestic demand. In 2011 OIES participated in some (so far unsuccessful in funding terms) potential joint (with Oxford University) ventures and proposals related to electricity demand. This topic continues to have direct relevance in a variety of contexts, including EMR, smart grids and

smart meters, energy efficiency, and the role of renewable energies.

Electric Vehicles

David Robinson has begun a research project on the potential market for electric vehicles. The central question he addresses is what potential they have to influence world oil demand and CO₂ emission reductions. He published a first article on this subject in the February 2010 Oxford Energy Forum.

Expanding the European Dimension in energy policy: the Commission's latest initiative

The European Commission has broken new ground in proposing to streamline national planning approval of vital energy infrastructure, use EU funds to leverage private finance for such networks, and to negotiate foreign pipelines on the EU's behalf. These initiatives coincide awkwardly with the eurozone crisis. But David Buchan broadly endorses Brussels' attempt to kick-start implementation of Europe's 2020 energy and climate goals. He suggests the Commission go a step further by taking advantage of the forthcoming treaty revision to propose a constitutional amendment on EU states' energy mix. This paper was published in October 2011.

US Energy and Climate Change Policy

David Robinson's project examines the critical importance of coal-based generation as a source of greenhouse gas emissions, and analyses the difficulties in cutting these emissions. The central argument is that the US coal and electricity lobbies were instrumental in stopping the passage of federal climate change legislation in 2009–10. Although this was considered a victory by these lobbies, the absence of legislation has arguably worsened the prospects for coal and coal-based electricity in the USA, and has had

other problematic implications. First, the USA has lost a large part of its credibility and influence in international negotiations over climate change. Second, important parts of the US economy, notably those involving 'clean coal' technologies like CCS, and related services, have been weakened as result of diminished demand in the USA and less financial support from the public and private sector. Third, the absence of US legislation has facilitated the growth of 'unabated' coal-based generation around the world, noticeably in China and India. This research will lead to an OIES book.

Balanced Clean Development in China – Climate Change

This research project is part of the OIES project on Balanced Clean Development in China. David Robinson and Benito Müller carried out a study on the potential for EU–Chinese large-scale collaboration to reduce CO₂ emissions in the Chinese power sector. The project is finished and the report was launched at the UNFCCC meeting in Tianjin in October 2010.

The central issue in the research is to identify barriers preventing large-scale collaboration to promote zero emission technologies in China, and to seek to lower those barriers through an EU–Chinese high-level agreement, specifically related to wind power.

David Robinson has developed the argument further, writing and speaking about the potential for agreements involving China to accelerate decarbonization on a global basis by driving down the costs of low-carbon technologies. He has spoken at a number of conferences on the topic, including in Bern (Switzerland) and Dalian (China) in 2011. He has been asked to speak on this topic at a conference in Istanbul (Turkey) in April 2012, and is preparing an OIES paper on the subject.

The research has had policy implications. In 2010, the Spanish

Government adopted a proposal from the paper, namely to sign an MOU with China to collaborate in the development of renewable and alternative energies. The Spain–China MOU contributed to global commercial agreements between Spanish companies and Chinese companies in the wind sector. The evidence of success with this combination of political and commercial agreements was used by the British Government and the EU to encourage China to support the sort of comprehensive global climate agreement that emerged in Durban.

Climate Change Negotiations

Dr Benito Müller continued his research on issues related to the climate change negotiations, with a particular focus on the work of the Transitional Committee (TC) for the design of the Green Climate Fund (GCF), because of his role as adviser to the Least Developed Country TC members. In that context he produced, among other things, four OIES submissions to the TC pertaining to the use of devolved national climate trust funds (National Funding Entities), which were subsequently included in the design of the GCF. He also worked on the general governance of the global climate finance system, and the future of the Kyoto Protocol in a legally binding regime.

CO₂ emissions from energy use: the third energy transition

There have been only three fundamental energy transitions in human history; the discovery of fire, the industrial revolution, and the transition currently under way to low-carbon energy. This research, by Malcolm Keay, looks into the nature of the present transition, how it can be effected, and what its consequences might be. The first module looks mainly at the past; the main output was a paper published electronically in November 2007, entitled 'Energy:

the Long View' which examined long-term energy developments (those taking place over hundreds of years) in order to help identify the basic drivers of energy demand and the associated emissions. The second module, currently under way, looks in more detail at whether existing policies to reduce CO₂ emissions are properly targeted on significant emissions drivers and on the areas where intervention can make a major difference. One direct output from this research was a paper 'Energy efficiency – should we take it seriously?' in December 2011. The third module will look forward, at the implications of the shift for the energy sector and society more widely and involves, among other things, analysis of possible options for electricity market reform, on which Malcolm Keay published two comment pieces in 2011.

Two further projects related to this research are: a contribution on the links between energy efficiency and energy security for a study of *Energy Security in a Multipolar World*, a major interdisciplinary project under the aegis of the UK Energy Research Council; and acting as lead author of a chapter on electricity market reform in the UK and the tension between free markets and environmental objectives, for a proposed multi-author publication surveying recent global developments in relation to electricity liberalization.

Valuation of social cost of CO₂ emissions

Valuations of the social cost of CO₂ emissions are routinely used to guide government departments in appraising policy initiatives and projects, and in applying cost benefit analysis to a variety of projects and policies. Valuations are set by HM Treasury in consultation with relevant departments. It is therefore a critical component of an effective policy to mitigate climate change. John Rhys has identified, in a view shared by many climate scientists, what he considers to be a serious inconsistency between

the science of climate change, which emphasizes the cumulative stock of CO₂ in the atmosphere, and much of the policy discussion and associated economic analysis. This was the subject of an OIES Working Paper in July 2011. John has subsequently reviewed and commented on current Treasury guidelines, which he believes carry the risk of significant distortions to policy.

Complementarity of CCS and EOR

David Robinson is carrying out research on the complementarity between carbon capture and storage (CCS) and enhanced oil recovery (EOR) projects. On the one hand, CCS is considered as critical in the fight to deal with climate change; but there is very slow progress in developing the technology at scale, and some important demonstration projects have been cancelled. On the other hand, EOR is an important means of increasing global recoverable oil reserves, and should become more attractive as oil prices rise; but there has been very little EOR outside of North America. The research illustrates that EOR can provide a source of revenue and CO₂ storage for CCS projects, and that CCS projects can provide CO₂ for EOR. It also identifies the key barriers that are slowing this mutually beneficial development.

David participated in a UNFCCC technical workshop in Abu Dhabi in September 2011 that defined the requirements to enable CCS to receive funding under the Clean Development Mechanism of the UNFCCC. He presented a paper on the complementarity of CCS and EOR in Dalian (China) in October 2011.

Prospects for Wind Energy in Colombia

David Robinson is directing an OIES project (funded by the UK FCO Prosperity Fund) on the potential for private investment in wind power in Colombia under the current regulatory framework. The project analyses how

wind power and other intermittent renewables should be compensated for their contribution to electricity system reliability, especially during periods of el Niño, when hydro generation is severely limited. How reliability is measured has an important impact on the profitability of wind power. We show that the current regulation underestimates that contribution. However, even when the contribution to reliability is properly measured, wind power is unattractive for private investors under the existing 'technology neutral' regulatory framework. The question for the Colombian Government is whether they wish to actively 'promote' wind and other renewable sources of power, as other countries like Peru have done, or to wait until these technologies are competitive without special treatment. If they decide to wait, then we recommend that they at least level the competitive playing field by (a) compensating properly the contribution of intermittent renewables to system reliability and (b) tax or otherwise take account of the negative externalities (in other words, the environmental and social costs) of large hydro and coal projects.

The aim of the study is to offer ideas to the Colombian Government on possible regulatory reform. The draft report has been sent to the Ministry of the Environment, the energy regulator (CREG), and potential investors in the energy sector. The report will be presented at a workshop at the British Embassy in Bogota in May. The OIES will publish the findings of the report. There may be a follow up research project to develop some of the ideas and proposals that have been introduced.

Journals and Website

In addition to its ongoing research programmes, the Institute publishes a debating journal and hosts an increasingly popular website. These activities not only help meet our goal as an educational charity, but also complement our research and place us at the centre of important debates within the field of energy.

Oxford Energy Forum

The Institute's quarterly debating journal, now in its twenty-second year, continues to tackle topical issues facing the energy world. During the year, issues covered have included: political events in the Middle East and their impact on energy; WTI and Brent benchmarks; nuclear power post-Fukushima; and technological challenges, developments, and breakthroughs in the global oil and gas industry. Our thanks go to the authors of all articles that appeared in OEF in 2011, to Bassam Fattouh the editor, and to our guest editors.

Website –

www.oxfordenergy.org

The redesigned website was launched in 2011. Its new design should make using the site easier and quicker to use; a bookshop was added for visitors to buy publications, and the Oxford Energy Forum was launched as an online addition.

The site contains full information on OIES presentations, publications and published articles, research in progress, and staff. The *Comment* section provides an assessment, by members of the research staff, of important energy events. The Natural Gas Programme and the Oil and the Middle East Programme have dedicated sections within the main site.

During 2011 the catalogue of working papers, energy comments, and presentations on the Institute's website continued to grow. The site now holds more than 200 working papers along with over 200 presentations and energy comments, all of which are freely available to download. Subscriptions to the Institute's email notification service continued to increase.

Lectures and Seminars

As part of its mandate to promote scholarly cooperation between energy producers and consumers, and its commitment to education, the Institute strives to disseminate the results of its research as widely as possible. The lectures and seminars enable the Institute's researchers to present the findings of completed projects and to subject work in progress to the criticism of colleagues in industry, government, and academia. They also help the Institute to introduce itself to new audiences and to promote recently published monographs and books. In 2011 the Institute's Research Fellows, its Programme Directors, and its Director gave over 90 lectures, presentations, and talks at various conferences, workshops, seminars, and meetings.

Energy Lectures

The Geopolitics of Energy seminar series, run in association with St Antony's College, Oxford, and organized by Dr Shamil Yenikeeff, ran during Hilary, Trinity, and Michaelmas terms in 2011. The series focused on the role played by geopolitics in the energy sector. Lectures given included, *Geopolitics of Middle Eastern and North African energy supplies* by Dr Bassam Fattouh and Dr Hakim Darbouche; *Geopolitics of unconventional gas* by Florence Gény, Statoil; *Geopolitics of Climate Change* by Dr Benito Müller; and *Geopolitics of Caspian Energy: A view from Britain* by Mr Angus Miller, Caspian Energy Adviser, Foreign & Commonwealth Office, UK. Our thanks go to all those who gave lectures in 2011. The programme for 2012 is currently being planned.

XXII Brainstorming

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 twenty-second such meeting was held in June this year in Nice, France with the kind support of Schlumberger. Over 40 participants engaged in lively discussions on a wide range of energy issues including the global economic outlook and risks, the oil and refining sectors, oil supply and demand, LNG and natural gas, climate change and carbon trading, alternative energy, the future of nuclear power, and geopolitics with a focus on MENA.

2011 Gas Day

The Institute's Natural Gas Programme organized its sixth annual 'Gas Day' in November 2011 to discuss current issues in natural gas including '2011 to 2015; Is the Gas Glut over?', concentrating on Europe, Russia/CIS, Asian LNG Markets, and North America. Also discussed was 'Post 2015/2020 – The Longer Term', covering presentations by guest speakers including 'The Third Package', 'US LNG Exports', and 'The Fukushima Effect'. The day ended with a discussion on 'How Others See Us – the Real Advocacy Challenge' with presentations from the energy utility and power generator RWE, Greenpeace Germany, and the Rt Hon. Malcolm Wicks MP. The Seminar, held at St Anne's College, Oxford, was attended by 85 people, including sponsors of the Natural Gas Programme and the Institute, and invited guests.

Gas Programme Sponsors Meeting

The Institute's Natural Gas Programme held its biannual Sponsors' Meetings on 12 and 13 April and 2 November at St. Hugh's College, Oxford. The meetings were attended by the Natural Gas Programme Sponsors and authors of the Programme from a range of countries and backgrounds: academia, industry, and journalism. Ongoing research projects and progress reports were discussed.

The April meeting discussed the project on global gas pricing, the transition to hub-based gas pricing in continental Europe, Russian & CIS gas consumption, transit issues, security of gas supply in south-eastern Europe, the impact of political change in north Africa, the UK natural gas market, Spanish market developments, and Chinese shale gas.

The November meeting focused on a review of chapters/working papers on pricing, CIS pricing, pricing in sub-Saharan Africa/MENA, political economy of pricing in gas-rich countries, LNG pricing in Asia: JCC forever?/south-east Asia, pricing of pipeline gas & LNG in Latin America, gas pricing in China, gas vs oil price volatility, interconnection of different gas markets, and longer term gas demand in Europe post nuclear moratoria.

Library

The Institute's library is its most valuable research tool. In 2011, the Institute continued to expand its collection through the addition of some 30 volumes. The library has in excess of 13,000 titles, comprising one of the world's foremost public collections of books, journals, and statistical sources within its specialist subject area. In addition, around 150 journals and annuals, many of a statistical nature, were received either through subscription or donation. There are now lengthy back files of some of these serial publications. The library also receives over 30 company reports each year.

The Institute has been fortunate in being able to acquire historical materials from a number of sources. In 1984 the Institute purchased the library from Walter J. Levy's London office. Since then, the Institute has acquired other materials from the late Professor Edith Penrose, and from both the Middle East Centre and the Latin American Centre, at St Antony's College. In 1988 Shell generously donated an extensive collection of periodicals to the library. During 1992 Walter Greaves kindly donated many items from his library. In 1993 John Mitchell donated material that he had collected over many years. Historical statistics are of obvious use in research; other publications that may seem no longer useful to commercial companies could still be of worth to the Institute. In 2001 Jim Jensen, former President of Jensen Associates, retired and sold his library. The Institute purchased a number of his books and journals for its collection.

The Institute is always interested to hear from companies that are clearing space on their shelves, in case they have material that would fill an important gap in its collection. The library is used not only by staff, but also by students from Oxford and other universities, and by researchers from abroad. It remains the Institute's

policy to maintain the collection as a valuable research tool and to ensure it is as widely accessible as possible.

The Institute would like to offer thanks to: Blackwell's, Elsevier, Energy Intelligence Group, the European Commission, ICEED, IEA, IFS, IMF, Gas Matters, Global Market Briefings, the Middle East Economic Survey, OAPEC, OPEC, OECD, Oxford University Press, Petroleum Argus, Petroleum Intelligence, for supplying, either free of charge or at a significantly discounted price, important trade journals, statistical sources, and other materials vital to our research work which could not have been afforded otherwise.

Research Team and Staff

Christopher Allsopp CBE, was appointed Director in January 2006; he is an Emeritus Fellow of New College, Oxford. He is author of a Review of Statistics for Economic Policymaking (the 'Allsopp Review'). He is a former Member of the Monetary Policy Committee (2000–3) and of the Court of Directors of the Bank of England (1997–2000). He is the Editor of the *Oxford Review of Economic Policy* and a Director of Oxford Economic Forecasting. Previous activities include working at HM Treasury, the OECD, and the Bank of England (where he was Adviser from 1980 to 1983) as well as extensive involvement with domestic and international policy issues as consultant to international institutions and private sector organizations. He 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. He has been involved with the work of the OIES since its inception.

Juan Carlos Boué, Senior Research Fellow, is an oil industry consultant; he started his career working at the international trading arm of Petróleos Mexicanos (PEMEX). His professional activities have focused on petroleum, alternating between academia – he was a Senior Research Fellow of the OIES from 2000 to 2004 – and industry. From 2005 to 2009, he was special advisor to the Venezuelan minister of Energy and Petroleum 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, and 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 Riggling the Rules?*

Upstream Profits and Taxes in US Gulf Offshore Oil and Gas (OUP, 2006).

David Buchan, Senior Research Fellow, joined the OIES in January 2007. He was educated in Oxford and Geneva. He started his writing career in 1970 with *The Economist* and in 1975 joined the *Financial Times* where he remained until 2006. He was based in Brussels, Washington DC, and Paris and covered energy, defence, the Soviet bloc, and diplomacy. From 2000 to 2002 he was the FT Energy Editor. He has focused on the European Commission's attempts to kick-start the expansion of cross-border energy infrastructure and networks, and he has recently published a paper 'Expanding the European dimension in energy policy: the Commission's latest initiatives'. Such initiatives – to streamline national planning for energy projects, to use EU funds to leverage in more private finance, and to lead negotiations with foreign energy suppliers – are important for the substance of energy policy. They are also significant for the politics of EU energy policy making, involving the EU in planning and external energy policy that have traditionally been the preserve of the EU's member states. David Buchan also contributed two OIES comments. One, called 'Applying belt and braces to EU energy policy', examined the inherent tension between two of Europe's main mechanisms for reducing carbon emissions – energy efficiency legislation and the emissions trading scheme. The other, 'Peering into the future fog of CO₂ – how road maps can help', examined the plethora of future energy 'road maps' to 2050 put out by various directorates of the European Commission. Such distant projections may seem confusing and pointless, but road maps can help establish some consensus around 'no regrets' options and therefore give investors some assurance about the future course of energy policy beyond the time limits in today's legislation. He also edited the official publication

for the World Petroleum Congress meeting in Doha in December 2011. Among those contributing articles were Howard Rogers and David Ledesma of the OIES Gas Programme.

Hakim Darbouche, Research Fellow, joined the OIES in April 2009. He is an expert on North Africa, focusing on energy, political economy, politics, and international relations, and has published extensively on issues relating to these themes. Prior to joining the Institute, he served as adviser on MENA affairs to a NATO agency in Brussels. He has a PhD in International Relations from the University of Liverpool. In Oxford, he is also a senior member of St. Antony's College and a Region Head on the MENA Desk at Oxford Analytica.

John Elkins, Research Fellow, was, until three years ago, 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. He joined the OIES in January 2008 and, in addition to editing many of its Gas Programme working papers, has written the paper 'Natural Gas in the UK: An Industry in Search of a Policy?', which was published in 2010.

Bassam Fattouh, Director of the Oil and Middle East Programme, is also Research Fellow at St Antony's College, Oxford; and Professor at the School of Oriental and African Studies. He 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; his articles have appeared in *Energy Economics*, *The Energy Journal*, and *Energy Policy*. Bassam Fattouh has also published in non-energy related areas. His papers have appeared in the *Journal of Development Economics*, *Oxford Review of Economic Policy*, *Economic Inquiry*, *Empirical Economics*, *Journal of Financial Intermediation*, *Economics Letters*, *Macroeconomic Dynamics*, and in other journals and books.

Andy Flower, Senior Research Fellow, joined the OIES in May 2009. He works as an independent consultant specializing in the LNG business. His areas of expertise include: strategy, marketing, project structures, LNG shipping, pricing, LNG 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. His last post prior to retirement was as Senior Adviser, Global LNG. 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 Fellow, joined the OIES in October 2008. He works as strategy consultant for a Dutch energy company. His main expertise lies in the field of electricity market analysis, energy transition, and security of gas supply. Previously, he held different positions at large multinational companies as project manager. His research concentrates on the role of natural gas in energy transition in the Netherlands. He studied Business Economics and Political Science at the Universities of Groningen and Amsterdam.

Fan Gao, Research Fellow, has been with the OIES since January 2011. She is seconded from Statoil, where she works in the field of Global Strategy and Business Development. Her research currently focuses on unconventional gas development (majorly shale gas) in China and its impacts on China's future energy plan and global energy landscape. She is a graduate of China Foreign Affairs University with a B.A. in English and International Studies. She worked in Statoil's offices in China, Norway, and the UK before this assignment with OIES. Her main areas of expertise are upstream business development and Chinese government and political affairs.

Patrick Heather, Senior Research Fellow, joined the OIES in June 2006; his paper 'The Evolution and Functioning of the Traded Gas Market in Britain' was published in August 2010. He is currently conducting research on the continental European gas hubs and their ability to provide market pricing in long-term contracts. Since 2004, Patrick has been an independent consultant advising and giving presentations to many different organizations including the ICE futures exchange, various producer and end user companies, financial institutions, and governments in Austria, Britain, France, Greece, Holland, Italy, Norway, Philippines, Poland, Russia, and Sweden. In 2006, he was appointed Commercial Advisor to South Hook Gas to assist them through the long commissioning phase of their world-leading LNG import facility in south Wales; this was successfully achieved in the fourth quarter of 2009. Prior to that he was Trading Manager at BG Group from 2002 to 2004, and before that he worked at PowerGen plc, where he set up their trading capability and managed the gas and power trading desks. Patrick has over 30 years experience of broking, trading, and risk management in the natural gas, power, and oil markets.

Cameron Hepburn, Senior Research Fellow, joined the OIES in November

2006. He is an economist specializing in environmental and public policy. He holds Fellowships at the LSE and the University of Oxford. He was educated at Melbourne University in Law and Chemical Engineering, and earned his doctorate in economics from Oxford (as a Rhodes Scholar). He is actively involved in public policy as a member of the DEFRA Academic Panel and as a founder of Vivid Economics. He contributed two background research papers to the Stern Review on the Economics of Climate Change. Cameron has been interviewed for TV, radio, and the printed press in various countries. Cameron is also a director of Climate Bridge, a company devoted to reducing greenhouse gas emissions in China.

Anouk Honoré, Senior Research Fellow, joined the OIES in 2004. She works in the Natural Gas Research Programme. She is an expert on the European region, focusing on natural gas issues, power generation, energy policies, market fundamentals (with an emphasis on natural gas demand), Liquefied Natural Gas (LNG), and security of gas supplies. She also studies the natural gas markets in Latin America. She published the book *European Natural Gas Demand, Supply and Pricing: cycles, seasons and the impact of LNG arbitrage* (Oxford University Press) in December 2010. Additional publications can be found on the OIES website. Before joining the Institute, Anouk worked at the International Energy Agency in Paris. Her work focused mainly on natural gas policies in the IEA member countries, but also included China and Latin America. Dr Honoré holds a PhD in Economics, a MA in Environmental and Natural Resources Economics, and a LLM in International Administration (public law).

Laura El-Katiri, is Junior Research Fellow at the Oil and the Middle East Programme, specialising on energy policy in the Middle East, with a focus on the Gulf economies. Her special interests include the political economy of natural resource wealth,

oil and natural gas markets in the GCC states, and GCC economic development and diversification. She is also a Teaching Fellow in the Department of Financial and Management Studies at the School of Oriental African Studies, University of London. Laura graduated in Arabic and Economics from the University of Exeter and in Modern Middle Eastern Studies from the University of Oxford.

Malcolm Keay, Senior Research Fellow, joined the OIES in January 2005. His career has ranged widely across the energy scene, including the public sector (he was Director of Energy Policy at the UK DTI from 1996 to 1999, and before that was a Division Head at the International Energy Agency), the private sector (as Senior Managing Consultant at Oxera), and the non-profit sector (at Chatham House and the World Coal Institute). He has acted as an adviser on many energy studies, including as Special Adviser to the 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* by Ian Rutledge and Philip Wrights (eds.) published in 2011 by Oxford University Press for the OIES. This updates the analysis and conclusions of his earlier 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. He is one of the authors of the Institute's book *Natural Gas in Asia* published in June 2008, and *Natural Gas in the Middle East and North Africa* published in May 2011, and in July 2009 he published a paper 'The Changing Relationship between NOCs and IOCs in the LNG Chain'. He is currently authoring a chapter for a book on the pricing of gas and LNG globally. 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. He is an associate of Outsights, an independent futures and scenario planning consultancy. During 30 years in the energy and utility sector David has worked on the development of complex integrated energy projects, negotiations at government level, and in the management of joint ventures. While with Shell, he worked in Malaysia and the Netherlands and travelled extensively to Oman and Asia. He 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 as 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, UK. He joined the Institute in November 2007.

Robert Mabro, CBE, Honorary President, was Director of the OIES until April 2003. He is an Emeritus Fellow of St Antony's College, a Fellow of St Catherine's College, and a lay director on the board of ICE Futures, the oil futures exchange in London. He is also the Dean of the Oxford Energy Seminar and the Honorary Secretary of the Oxford Energy Policy Club. In November 2005 Robert Mabro stepped down as President of the Institute. The

Board of Governors appointed him Honorary President in November 2006.

Lavan Mahadeva, Senior Research Fellow, joined the OIES in August 2011 and heads up its macroeconomic research. He is concerned with the interaction of energy markets with the macroeconomy and international finance. He is working on what constitutes good macroeconomic policy in energy exporting countries and how global financial market conditions affect energy prices. Prior to joining the Institute, Lavan Mahadeva was a Bank of England economist for 16 years. He began by modelling and forecasting the UK economy. He then joined the Bank's Centre for Central Banking Studies and worked 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 from 2005 to 2006 and he spent 2007–9 with the Central Bank of Colombia as Adviser to the 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 *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.

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. Dr Müller is a Supernumerary Fellow of Wolfson College, Oxford and a member of the

Philosophy Faculty of the University of Oxford. He is Senior Research Associate of Queen Elizabeth House, the University of Oxford's International Development Centre, and an Associate Fellow of its Environmental Change Institute. He is on the board of directors of the Stockholm Environment Institute (Oxford) and of Climate Strategies, a London-based academic network organization focused on developing and delivering research to meet the needs of international climate change policymaking. He was also a Specialist Adviser on Climate Change to the International Development Committee of the UK House of Commons. Dr Müller received his doctorate (DPhil) in Philosophy from the University of Oxford, specializing in Philosophy of Language and of Science, and was formerly a Research Fellow at Wolfson College and a Lecturer in Logic at the Queen's College, Oxford. He has a Diploma in Mathematics from the Eidgenössische Technische Hochschule (ETH) in Zürich, Switzerland. He has also been an expert reviewer of the Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC).

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, in particular Sino-Russian oil and gas cooperation, China's natural gas industry, and DPRK's offshore oil exploration. Currently he is an Associate Fellow of the Energy, Environment and Development Programme, Chatham House. 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). His new and comprehensive study on China's gas expansion 'The Implications of China's Gas Expansion towards Natural Gas Market in Asia', was published by Chatham House in 2004. Dr Paik has contributed well over 35 papers to *Energy Policy*, *Journal of Energy and Development*, *Geopolitics of Energy*,

The Pacific Review, Energy Exploration & Exploitation, Oil & Gas Journal, Petroleum Economist, Pipeline and Gas Technology, FT Asia Gas Report, China Daily Business Weekly, China Brief, The World Today, RIIA Briefing papers, and Asia-Pacific Review. He is currently working on his second book project, on Sino-Russian Oil and Gas Cooperation, and contributed the Korea Gas Industry chapter for the OIES book *Natural Gas in Asia: the Challenges of Growth in China, India, Japan and Korea*, 2nd Edition published in 2008.

Simon Pirani, Senior Research Fellow on the Natural Gas Programme, joined the OIES in September 2007, and is editor of its book, *Russian and CIS Gas Markets and their Impact on Europe*. He studied Russian at the University of London, wrote a doctoral dissertation at the University of Essex, and is the author of a monograph on Soviet history, *The Russian Revolution in Retreat*, published by Routledge in 2008. He has worked in journalism and publishing since 1977, including a spell as editor of the UK miners' trade union journal in 1990–95. He writes about energy, politics, and the economy of the former Soviet Union, in financial and industry publications including *Gas Matters, Project Finance, and Emerging Markets Finance and Trade*. His research at the Institute focuses on the development of natural gas markets, and changing consumption patterns, in the former Soviet Union. His latest book *Change in Putin's Russia: Power, Money and People*, was published in 2009 and he is the author of 'The Impact of the Economic Crisis on Russian and CIS Gas Markets' an Institute working paper published in 2009, and co-author of 'The April 2010 Russo-Ukrainian gas agreement and its implications for Europe' published in 2010.

John Rhys, Senior Research Fellow, joined the OIES in March 2010, having been one of its senior research advisers. He obtained an Honours 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, 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 University of Sussex, Energy Group. His current interests include energy policy in relation to climate change, on which subject he has given written and oral evidence to the Environmental Audit Committee of the House of Commons.

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 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 has 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 OIES in January 2009 after a long career in BP in upstream oil and gas business development and strategy, including postings to the USA, Kuwait, and Azerbaijan. His last post in BP was Head of Fundamental Analysis, Global Gas. In 2010 he published an OIES research paper 'LNG Trade-flows in the Atlantic Basin: Trends and Discontinuities' on the subject of LNG arbitrage between the regional markets of Asia, Europe, and North America, based on a quantitative modelling framework. With Jonathan Stern he

co-authored a paper on the transition to hub-based gas pricing in continental Europe in 2011. He published a paper 'The Impact of Import Dependency and Wind generation on UK Gas Demand and Security of Supply to 2025' in 2011, and in early 2012 a paper 'The Impact of a Globalising Market on Future European Gas Supply and Pricing: the Importance of Asian Demand and North American Supply'.

Anupama Sen, Research Fellow, joined the OIES in October 2009 to work on the economics of energy in India. She holds a BA (Hons) 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. She is also a Fellow of the Cambridge Commonwealth Society. Her doctoral research involved an empirical analysis of the economic impacts of autonomous electricity sector reform in Indian states, whilst accounting for their inherent economic and political diversity. Anupama's research interests are in the economic and applied econometric analysis of outcomes in energy sector reform in developing countries. Her work at the Institute is broadening to include wider themes within India's energy sector, including oil, gas, and climate change, with a particular focus on the interconnectedness of these themes, through factors such as energy pricing. Anupama is currently researching aspects of fiscal regimes in hydrocarbons exploration and production in India. She is also a Visiting Fellow at Wolfson College, Cambridge.

Jonathan Stern, Chairman of the Natural Gas Programme and Senior Research Fellow, is also Honorary Professor at the Centre for Energy, Petroleum & Mineral Law & Policy, University of Dundee; and Visiting Professor at Imperial College's Centre for Environmental Policy in London. He is a Member of the Board of Advisers for the Center for Energy Economics, Bureau of Economic

Geology at University of Texas at Austin. He is the author of several books, including *The Future of Russian Gas and Gazprom* (Oxford University Press, 2005) and many shorter works on energy and natural gas issues. During 2011, Jonathan Stern's major research focused on gas pricing. He co-authored (with Howard Rogers) an OIES paper 'The Transition to Hub-Based Gas Pricing in Continental Europe', which was published in March 2011. During the year he began work on an edited volume, *The Pricing of Internationally Traded Gas*, comprising 14 chapters and involving 15 authors, to be published by the Institute in 2012. Following publication in March 2011 of the book *Natural Gas Markets in the Middle East and North Africa* he co-authored with Bassam Fattouh, he organized launches, in London, Doha, Washington DC, and Tokyo. During the year he continued to work on European gas pricing developments, and general Russian and CIS gas issues.

In October 2011, Jonathan Stern was appointed EU Speaker for the EU–Russia Gas Advisory Council, a body set up by EU Energy Commissioner Oettinger and Russian Energy Minister Shmatko to assess future trends in the gas sector in order to reduce risks and to exploit opportunities in EU–Russia gas cooperation.

Katja Yafimava, Research Fellow, joined the OIES in November 2006 to work in the Natural Gas Research Programme. She holds a DPhil in Geography and an MPhil in Russian and East European Studies from the University of Oxford (Corpus Christi College). The topic of her doctorate thesis was 'The Importance of Russian Gas Transit across Western CIS Countries for EU Energy Security, 1998–2007'. She is currently working on a book *The Transit Dimension of EU Energy Security: Russian Gas Transit Across Ukraine, Belarus, and Moldova* to be published by OUP in 2011. She has authored a chapter on the Belarusian gas market and has also co-authored a chapter on Moldova for *Russian and CIS Gas Markets and their Impact on*

Europe edited by Simon Pirani and published by OUP in February 2009. She also co-authored a working paper on the January 2009 Ukrainian gas crisis, together with Simon Pirani and Jonathan Stern. She published a working paper on the June 2010 Russia–Belarus gas dispute, a short version of which also appeared in *Petroleum Review*. She also reviewed several papers for *Journal of European integration* and *The Energy Journal*. She has also presented her work at various conferences (The Skolkovo School of Management, Moscow; SITE, Stockholm; CEU, Budapest). Her book *Post-Soviet Russian-Belarusian Relationships: the Role of Gas Transit Pipelines* was published in March 2007. Prior to joining the Institute and in parallel with her doctoral studies, she was an intern at Shell (2005) and at the Energy Charter Secretariat (2006).

Shamil Midkhatovich Yenikeeff, Research Fellow, is a Senior Associate Member at the Russian and Eurasian Studies Centre, St Antony's College, University of Oxford. Dr Yenikeeff 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. Amongst the latest of these is an article 'Energy Interests of the "Great Powers" in Central Asia: Cooperation or Conflict?', (*International Spectator*, Vol. 46, No. 3, September 2011) as well as a study on natural resource management in Russia (co-authored with Valery Kryukov and Anatoly Tokarev) which featured as a chapter in *Plundered Nations? Successes and Failures in Natural Resource Extraction* (Palgrave Macmillan, 2011), edited by Paul Collier and Tony Venables. Dr Yenikeeff is also the author of *The Battle for Russian Oil: Corporations, Regions, and the State*, a forthcoming book on the politics of the Russian oil sector under Yeltsin, Putin, and Medvedev to be published by Oxford University Press in 2012.

Renfeng Zhao, Research Fellow, joined the OIES in 2007 to participate in a project on balanced clean development in China. His work focuses on China's energy strategy and development policies, and China's energy diplomacy and its geopolitical implications. Previously, he worked at *China Daily* as energy and finance correspondent from 1997 to 2005. He holds a double master's degree in Journalism and Global Studies from EU Erasmus Mundus Programme. He 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 Institute in 2011. Their dedication and professionalism was essential to its continued smooth running.

- **Lavinia Brandon** provides administrative support and has responsibility for managing and maintaining the Institute's excellent library.
- **Jo Ilott** provides administrative support for the Natural Gas Programme.
- **Margaret Ko** is responsible for the Institute's accounts.
- **Susan Millar** manages the Oxford Energy Policy Club and Oxford Energy Seminar.
- **Kate Teasdale** is the Institute's administrator.

Visiting Research Fellows, Research Advisers, Contributing Authors, and Students

Siamak Adibi, Contributing Author, is currently head of the Middle East gas team at FACTS Global Energy (FGE), a consulting company based in Singapore. Siamak specializes in the natural gas/LNG business with a focus on the Middle East, North Africa, and CIS countries. He holds an MA in Energy Economics and was previously with the National Iranian Gas Export Company (NIGEC). Recently, he led an FGE in-depth study into Middle East and North African countries, focusing on gas. Siamak Adibi has presented at several oil and gas briefings/conferences in Asia and the Middle East. His work has appeared in numerous international publications.

Ali Aissaoui, Senior Research Adviser, is senior consultant at the Arab Petroleum Investments Corporation (APICORP) where he previously held the position of Head of Economics & Research. Before joining APICORP he worked as senior research fellow at the OIES. Prior to that, he served as energy policy advisor to the Algerian government, while acting as that country's representative on the OPEC Board of Governors. At APICORP he has focused on scrutinizing the corporation's business environment, and on framing its strategy. Ali Aissaoui is author and co-author of books, chapters of books, and numerous analyses and critical reviews. Topics addressed include energy markets and prices, investments and funding, as well as the political economy of the major petroleum-exporting countries. His current thoughts and views are reflected in APICORP's monthly Economic Commentary, which he authors and edits. Ali Aissaoui is a member of several professional associations, including the Oxford

Energy Policy Club, the Paris Energy Club, and the Arab Energy Club.

Randa Alami, Contributing Author, is a development economist specializing in the Middle East, and is currently a Teaching Fellow at the School of Oriental and African Studies, University of London. Previously, Randa worked as a Research Fellow at the OIES and at UNCTAD, and has been a consultant to DFID, ESCWA, and others.

Sofya Alterman, Visiting Research Fellow, conducted research with the OIES in July and August 2011, focusing on natural gas price volatility across markets. Sofya's background is in private equity. She is a Vice President with a private equity firm in New York, where she has worked since 2003. Sofya's contact with the OIES began as part of her research for a study on Trends and Pricing Dynamics in LNG, which she undertook as part of her MBA at Harvard Business School in 2010. Her first degree is in Business Economics from the University of Louisville, Kentucky.

Robert Arnott, Senior Research Adviser, is currently a Director on the boards of Petroceltic International plc and Spring Energy ASA, having spent five years with DNO where he advised the company on international business development and corporate strategy. He is also a Director of Impax Environmental Markets plc, which invests in clean energy, waste, and water technologies. He worked as a Senior Fellow at the OIES from 2001 to 2005; his research focused on all aspects of mature oil and gas provinces, as well as the corporate strategies of the major energy companies. He has a strong background in all aspects of

exploration and production and is recognized for his research into the upstream oil and gas industry. He worked as a geologist and economist with Royal Dutch Shell prior to entering the City in 1991, where he held senior positions as an oil and gas equity analyst for 10 years.

Michael Bradshaw, Visiting Senior Research Fellow, joined the OIES in August 2008. He is Professor of Human Geography and a former Head of the Department of Geography at the University of Leicester, UK. 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. For more than a decade he has studied the development of the Sakhalin oil and gas projects in Russia's Far East. This has led to research on energy security in north-east Asia. From 2008 to 2011 he was engaged in a programme of research on Global Energy Dilemmas, funded by a Leverhulme Trust Major Research Fellowship, that examined the relationship between energy security, globalization, and climate change. In January 2011 he started a two-year research project on global gas security funded by the UK Energy Research Centre. He is Editor-in-Chief of Wiley-Blackwell's *Geography Compass*, Contributing Editor of *Eurasian Geography and Economics*, and a past editor of *Area*. In addition to his involvement in OIES, he is an Honorary Senior Research Fellow in the Centre for Russian and East European Studies at the University of Birmingham. At present, he is Vice President (Research and Higher Education), and a member, of the Council of the Royal Geographical Society (with IBG).

Michael Xiaobao Chen, Visiting Research Fellow, is a Principal Analyst

at Statoil where he works with global strategy and business development. Michael started his career at the OECD as an economist, focusing his research on economic development in China, and its global impacts. He then joined the International Energy Agency, where he worked in the World Energy Outlook's long-term global energy forecast team. Michael's main areas of expertise are: the Chinese energy economy and regulations, the ASEAN energy market, global fossil fuel subsidies, and upstream industry trends. Michael holds a BA in Economics from Lancaster University, an MSc in Economics from University College London, and an MSc in Development from the London School of Economics.

Andrew Cleary, Visiting Research Fellow, is a Director of Integrity Research and Consultancy Limited, where he is responsible for the company's strategy and growth in the Middle East and North Africa. Andrew started his career in the Canadian Parliament, working for a legislator, before moving into the research sector, undertaking the study of natural gas and political risk-related contracts with private firms in Europe and the USA. Andrew wrote the chapter relating to Syria, Lebanon, Israel, and Jordan for the book *Natural Gas Markets in the Middle East and North Africa*, recently published by the OIES, having lived, worked, and studied in the region. Andrew holds a BSocSci (Hons) from the University of Ottawa and an MSc Econ from Aberystwyth University.

Justin Dargin, Contributing Author, is an Energy Research Fellow with Harvard University and a Fulbright Scholar of the Middle East. He is a specialist in energy law, and the Middle Eastern oil and gas market. He has many years of experience in the MENA oil and gas market. Previously, Dargin worked in the legal department of OPEC where he advised senior officials on various multilateral issues. He is the author of *Desert Dreams*, a book about the intersection of Middle Eastern geopolitics,

energy, and state formation. He sits on the board of directors of the International Energy Foundation.

John Enos, Visiting Research Fellow, is Emeritus Fellow in Economics at Magdalen College, Oxford. He joined the OIES in 1994 to carry out a study of improvements to oil refinery processing units in the previous half century. He completed his research on the fluid catalytic cracking process, now published as *Technical Progress and Profits: Process Improvements in Petroleum Refining*. His current research focuses on the diffusion of innovations to large state-owned oil companies.

Jon Farrimond, Contributing Author, works for the Financial Services Authority.

Fereidun Fesharaki, Contributing Author, is Chairman of FACTS Global Energy (FGE), an energy consulting firm with offices in Singapore, London, Dubai, Honolulu, Beijing, Perth, and Yokohama. He received his PhD in Energy Economics at the University of Surrey and has led energy-related academic research at the East–West Center since 1985. Prior to founding FGE, Dr Fesharaki was at Harvard's Center for Middle Eastern Studies. He was the Energy Adviser to the Prime Minister of Iran and a Delegate to OPEC's Ministerial Conferences.

Michelle Michot Foss, Contributing Author, is Chief Energy Economist and Head of the Bureau of Economic Geology's Center for Energy Economics, Jackson School of Geosciences, The University of Texas at Austin. She has more than 25 years of experience on US and North American natural gas market, industry, and policy/regulatory issues. Prior to her university appointments, she worked in energy investment banking (Simmons & Company International), and energy, environment, and regional economics research and consulting.

Florence Gény, Visiting Research Fellow, works 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) and commercial structures, in particular in gas value chains, and energy industry trends. Her research currently focuses on unconventional gas in North America and Europe and impacts on gas markets. She graduated from École des Hautes Etudes Commerciales (HEC) with a Master in Science of Management and from Université Paris XI with a Master in Business Law.

Franz Gerner, Contributing Author, is a Senior Energy Economist with 15 years of experience in the gas sector, focusing on gas market reform, restructuring, pricing, and economic regulation. He currently works on the World Bank's gas business and dialogue in Eastern Europe and Central Asia, and has previously covered Egypt and Yemen. He has published widely including a World Bank publication: *Republic of Yemen: A Natural Gas Incentive Framework*.

Anastasios Giamouridis, Senior Visiting Research Fellow, is an Associate at the Gas Supply Division of DEPA, where he focuses on international gas and LNG markets and commercial negotiations, including those for new supply contracts and price reviews. Previously, he was the Lead Consultant for south-eastern Europe and Turkey at PFC Energy, and a Researcher at the UK House of Commons. He holds degrees from the London School of Economics and the University of Durham. His current research with OIES focuses on upstream gas and monetization in the eastern Mediterranean.

Marianne Haug, Senior Research Adviser, teaches Energy Policy and Sustainable Development at the University of Hohenheim, Stuttgart in Germany. She is Chairman of the Board of the Forum für Zukunftsenergien, Berlin, Germany's only independent forum for energy policy, and a member of the Advisory Board of

the OMV Future Energy Fund. At the European Commission, she serves as Chair of the AGE7 – Advisory Group for Energy for the 7th Framework Programme – and is a member of the High-level Advisory Council for the European Hydrogen & Fuel Cell Technology Platform. During the years 2001–5, she served as Director at the International Energy Agency (IEA) in Paris, in charge of the Office of Energy Efficiency, Technology, and R&D, following a long career as Director at the World Bank in Washington and in the private sector.

Charles Henderson CB, Senior Research Adviser, is retired from the Department of Trade and Industry where he was Head of the Energy Directorate. He is a former Chairman of TOTAL Oil's business in the UK and a member of the Monopolies and Mergers Commission.

James Henderson, Senior Visiting Research Fellow, has been analysing the Russian oil and gas industry for the past 15 years. Having been Head of Energy for Wood Mackenzie Consultants in the mid-1990s, he moved to Moscow as Head of Oil & Gas Research for Renaissance Capital in 1997, and in 1999 became their Head of Equity Research. He returned to the UK in 2002 and is currently Head of Russia for Lambert Energy Advisory in London. He completed his doctoral thesis on partnership in the Russian oil and gas industry at the University of London, and received his PhD in 2010.

Jonathan Hill, Contributing Author, works for the Financial Services Authority.

Paul Horsnell, Senior Research Adviser, is a Managing Director and Head of Commodities Research at Barclays Capital, the investment banking division of Barclays Bank plc. He is responsible for Barclays Capital's research in global commodities markets, covering energy, base metals, precious metals, carbon, and agricultural products. Barclays Capital has a team of commodities analysts based in London, New York, San Francisco, and Singapore. Dr Horsnell joined Barclays Capital in 2003 from JPMorgan where he was 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. He is the author of *Oil in Asia: Markets, Trading, Refining and Deregulation* (OUP/OIES, 1997) and (with Robert Mabro) *Oil Markets and Prices: The Brent Market and the Formation of World Oil Prices* (OUP/OIES, 1993). He holds a degree in Philosophy, Politics, and Economics, and a doctorate in Economics, both from Keble College, Oxford.

Anil Jain, Senior Visiting Research Fellow, is a member of the Indian Administrative Service, the federal civil service of India. He holds a Bachelor's Degree with Honours in Economics, and an MBA with specialization in Marketing. He also took a one-year Diploma programme at the Indian Institute of Foreign Trade, New Delhi. He has over 25 years of administrative experience, both at field and policy formulation levels. He has held senior positions in the provincial and federal governments in the Ministries of Agriculture, Mining, Industries, Revenue, and Petroleum & Natural Gas. In separate assignments, he has been exposed to the differing development-related issues faced by villages and by small and large industries. During the years 2003 to 2008, as Director and Joint Secretary in the Ministry of Petroleum and Natural Gas of the Government of India, he piloted the petroleum exploration and international cooperation activities. He has been closely associated with the development of the natural gas sector (including award of acreages, development of discoveries, pricing, and distribution) and its deregulation. Presently, he is posted as Special Commissioner at New Delhi, the national capital, where he promotes the interests of the provincial State Government of Madhya Pradesh.

David Jalilvand, Student, visited the OIES in July and August 2011 to carry out research for his MSc degree in Global Politics at the London School of Economics and Political Science.

Najeeb Jung, Senior Research Adviser, is Vice Chancellor, Jamia Millia Islamia University, New Delhi. He joined the Indian Administrative Services (IAS) in 1973 and has worked in different capacities in Madhya Pradesh and with the Government of India. 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/Special Task Forces set up by the Government of India to deal with education and governance. He is also a regular columnist writing for several national newspapers.

Yelena Kalyuzhnova, Senior Visiting Research Fellow, founded and is Director of the Centre for Euro-Asian Studies at the University of Reading, UK. She is an authoritative expert on the economics of energy and transition economies. Professor Kalyuzhnova is the author of 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 (BG Group, Burren Energy, ChevronTexaco, Shell International) and international organizations such as UNECE, the World Bank, the IMF, and the EBRD. She has contributed to numerous economic studies for international organizations (The World Bank, European Bank for Reconstruction and Development, Economic Commission for Europe, United Nations, UNDP, etc.) and is a frequent speaker at international level on economic, environmental, and energy issues. Professor Kalyuzhnova is an economic adviser on Caspian issues to the Rt Hon. Lord Fraser of Carmyllie, QC, House of Lords and an economic adviser to the All-Party Parliamentary Group on Kazakhstan, House of Commons, UK Parliament.

Aleksandar Kovacevic, Senior Visiting Research Fellow, started his professional career with the Federal Productivity Institute of the former Yugoslavia in 1986. He graduated in energy economics at Belgrade University. He is principal author of the energy-poverty analysis 'Stuck in the Past' (UNDP, 2004), 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), and author of a number of papers, lectures, and media contributions. 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 1999 war. He was affiliated to PlanEcon before 1992, project manager for Tagarnrog Development project in Russia (1992-8), and a contributor to the Black Sea and Central Asia panel at the Harriman Institute, Columbia University. Aleksandar has been a member of the Advisory Board to the Russian Power Conference since 2002,

and of the UNECE Group of Experts in 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, Senior Research Adviser, is a theoretical physicist. He is currently Director of Energy Research, Oxford University, and President of the Council of SESAME (Synchrotron-light for Experimental Science and its Applications in the Middle East). He has served as Chairman of the Council of ITER (2007-9) and of the Consultative Committee for Euratom on Fusion (2004-9), and was Director of UKAEA Culham (2003-8), 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 Oxford Physics (1987-92). During his mandate as DG of CERN the Large Hadron Collider (LHC) was approved and construction started.

After completing his Doctorate in 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, Senior Research Adviser, 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 University 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 undertaking 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 and the Environment, Governance, and the Law.

Edwin R. Lim, Senior Research Adviser, was educated at Princeton University (BA) and Harvard University (PhD in Economics). He joined the World Bank in 1970 and in the following 30 years, was responsible for the Bank's work in a number of developing countries, including Ghana, Nigeria, Indonesia, Thailand, Vietnam, India, and China. In 1980, Dr Lim was a member of the management team of the World Bank that conceived and directed the Bank's programme in China. He established the World Bank's office in China and served as the first Chief of Mission from 1985 to 1990. He returned to headquarters in 1990 when he was appointed a Director, with responsibility for Western Africa. In 1994, Dr Lim took two years external leave from the World Bank to set up China International Capital Corporation (CICC), China's first international investment bank, and served as CICC's first CEO. He returned to the World Bank in 1996 and was appointed the first Country Director to be stationed in New

Delhi, India. Since 2003, Dr Lim has been directing the China Economic Research and Advisory Programme which provides policy advice, pro bono, to the Chinese authorities.

Joan MacNaughton, Senior Research Adviser, joined the OIES in September 2006. She is Global Adviser, Sustainable Policies, Alstom Power. An influential figure in energy and climate policy, Joan oversaw the energy agenda during the UK's Presidency of the EU, led the energy work at the G8 Gleneagles Summit, and chaired the Governing Board of the IEA. From 2007 to 2011, Joan led Alstom's policy department and spearheaded the company's clean power advocacy: to advance clean, sustainable energy and reduce power generation CO₂ emissions. She now acts as Global Adviser on Sustainable Policies for Alstom. Joan is President of the Energy Institute, Vice Chair of the UN High Level Panel of the CDM Policy Dialogue, Executive Chair of the World Energy Council Policy Assessment, and a member of the Board of Governors, Argonne Laboratory at the University of Chicago; Joan also holds several other appointments.

John Mitchell, Senior Research Adviser, is an Associate Research Fellow at Chatham House and Honorary Fellow at the Centre for Energy, Petroleum & Mineral Law & Policy at the University of Dundee. In November 2007 he received a lifetime achievement award for research from King Abdullah at the opening of the Third OPEC Summit in Riyadh. He retired in 1993 from British Petroleum, where his posts had included Special Adviser to the Managing Directors, Regional Co-ordinator for BP's subsidiaries in the Western Hemisphere, and head of BP's Policy Review Unit. Mitchell has written three books: *The New Economy of Oil* (2001), *Companies in a World of Conflict* (editor, 1998) both published by Chatham House/Earthscan; and *The New Geopolitics of Energy* (Chatham House 1996). He was a contributor to *Oil Titans* by Valérie Marcel (Brookings/

Chatham House, 2006), and has written numerous reports, briefing papers, and journal articles, including 'More for Asia: Rebalancing Global Oil And Gas' (Chatham House 2010).

Shirin Narwani, Visiting Research Fellow, and Senior Member at St. Antony's College, Oxford, joined the OIES in November 2011. She has previously worked at OIES, the Centre for Global Energy Studies (CGES), and the *Petroleum Economist*. She has a BA in Economics and an MPhil in Modern Middle East Studies from the University of Oxford. She has published on varied topics from oil markets to energy-related environmental issues, with a particular concentration on energy in the Middle East. Her professional activities also focus on working with NGOs on projects in the Middle East. She has produced an Iranian film Ra'ye Makhfi (The Secret Ballot) which won ten international awards including several at the 2001 Venice film festival. Her research at OIES focuses on energy sector issues in Iran; she has recently written a paper on Iran's energy subsidy reform programme for the Oxford Energy Forum which forms part of a working paper entitled: 'Iran's Energy Subsidy Reform: Impact and lessons for other energy-rich MENA countries', to be published in 2012.

Waniss A. Otman, Contributing Author, is a petroleum economist who specializes in the area of risk and uncertainty analysis. He holds a PhD in risk analysis of investment in the upstream oil and gas sector, as well as related LLM, MSc, and BSc degrees. He has written many peer-reviewed articles and authored these books: *The Libyan Petroleum Industry in the Twenty-First Century*; *The Libyan Economy: Economic Diversification and International Repositioning*; *Libyan Oil and Gas Resources*; *Oil and Gas Fiscal Review*, Iraq Energy Institute; *Understanding Modern Libya*; and *Africa's Energy and Natural Resources in the Global Economy*.

Spiros Paleoyannis, Contributing Author, is the Deputy CEO and Vice

Chairman of DEPA SA, which he joined in 1988. Between 2005 and 2009 he served as a senior executive and high-level advisor to its Chairman and CEO; prior to that he held the positions of General Director of the Gas Trading Division (1997–2004); of Managing Director (1996); of General Manager (1993–6); and of Head of Strategic Planning and Development (1991–3). Between 2003 and 2009 he also served as Deputy Chairman at the Institute of Energy for South East Europe (IENE), and he has also been a member of the Board of Directors of the Public Petroleum Corporation of Greece (now Hellenic Petroleum); a General Manager at Asprofos Engineering; and a senior executive in a number of other public and private companies in Greece. Spiros Paleoyannis has an academic background in chemistry and also holds an MBA with focus on strategic management. He is the President of the International Centre for Business Studies (ICBS), Kingston University, Alumni Group in Greece, and a member of the Advisory Board at the Faculty of Business and Law of Kingston University.

Concetta Perrini, Student, visited the OIES for three months in August 2011 to carry out research for her Masters degree in Corporate Finance and Business Management at LUISS University, Rome.

Robert Ritz, Visiting Research Fellow, is an economist with research interests in industrial organization and environmental economics. His current research focuses on the design of market-based environmental policy and its impact on firms. Two recent projects are: allocating emissions permits in a cap-and-trade scheme (such as the EU ETS) to neutralize any adverse impact on firms' profits; and quantifying the degree of 'carbon leakage' when not all firms in an industry are covered by environmental regulation. He is also interested in the economics of cost pass-through and how different types of risk affect the investment decisions of oil and gas companies.

Ian Rutledge, Contributing Author, is director of SERIS (Sheffield Energy and Resources Information Services) and Honorary Senior Research Fellow in the Management School at the University of Sheffield. His career has included three years of employment as a miner with the National Coal Board. He is author of *Addicted to Oil: America's Relentless Drive for Energy Security*, published by I.B. Tauris, 2005 and 2006.

Ivan Sandrea, Senior Research Adviser, is President of Energy Intelligence Group in London. Past positions include Vice President Global Strategy and Business Development and Vice President of Strategy International Exploration & Production (E&P) at Statoil (2007–11), head of oil supply at the Organization of the Petroleum Exporting Countries (Vienna), associate Vice President of oil and gas for Merrill Lynch (London), and exploration and operational geologist at British Petroleum International (Venezuela, Norway, and Egypt). Mr Sandrea regularly collaborates with various international institutions in oil and gas research, and has represented OPEC at the UN in efforts to reclassify global oil and gas resources. Mr Sandrea is a senior research adviser at the OIES, a member of the Oslo Energy Forum (Norway), and a board member of the Energy MBA programme at Wirtschaftsuniversität (WU) in Vienna. He is a former Board Member (three years) at Pan Andean Resources, a Latin American-focused UK-listed E&P Company (acquired by Petrominerales). He holds a BS in geology from Baylor University, a MS in petroleum geology, and a MBA from Edinburgh University. Mr Sandrea was born in Venezuela.

Paul Segal, Senior Visiting Research Fellow, is also a Lecturer in Economics at the University of Sussex. He works on economic development, the economics of resource-rich countries, and the macroeconomics of oil prices. He completed his DPhil in Economics at Nuffield College, Oxford, in 2006, having previously been a

consultant economist at the United Nations Development Programme in New York, and a Research Fellow at Harvard University. 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.

Adnan Shihab-Eldin, Senior Research Adviser, currently serves as a senior adviser and consultant to a number of public and private institutions, organizations, and companies, including as member and adviser to Kuwait National Nuclear Energy Committee. In 2005 he served as the Acting Secretary General of the Organization of Petroleum Exporting Countries (OPEC) where he also served as Director of Research, from August 2001 through March 2006. From March 1999 to August 2001 he served as Director of the Division for Africa, East Asia, and the Pacific, Department of Technical Cooperation, at the International Atomic Energy Agency (IAEA) in Vienna, Austria. Prior to joining the IAEA, from December 1991 to February 1999, he served as Director of the UNESCO Regional Office for Science and Technology (Cairo) and as the UNESCO Representative in Egypt, Sudan, and Yemen. Prior to his career with international organizations, he taught, lectured on, undertook, and directed research in the physical and engineering sciences as well as in energy economics and technology, at a number of universities and research centres in Kuwait, the USA, and Europe, including Kuwait University, the Lawrence Berkeley National Laboratory, the University of California at Berkeley, the European Nuclear Research Center in Geneva, Switzerland, and at the Energy and Environment Policy Center at Harvard University in Cambridge, Massachusetts, USA. From 1976 to 1986 he was the Director General of the Kuwait Institute for Scientific Research.

Nevzat Simsek, Visiting Research Fellow, is Assistant Professor, Department of Economics, Faculty

of Economics and Administrative Sciences, Dokuz Eylul University, Turkey. He won a scholarship to carry out post-doctoral research on 'Crude Oil and Natural Gas: A Demand and Supply Model for the World Market'. He joined the OIES in July 2010.

Ian Skeet, Senior Research Adviser, is a consultant to the OIES and former editor of *Oxford Energy Forum*.

Robert Skinner, Senior Research Adviser, is an independent energy consultant in Calgary, Canada. He is a Former Director of OIES and was previously Senior Vice President, Strategy, Commercial, and Government Affairs for StatoilHydro's Canadian subsidiary; Administrator Northern (Alaskan) Pipeline Agency; Vice President Oil Sands Total E&P Canada Ltd; Director of Policy Office of International Energy Agency; and Assistant Deputy Minister Energy (Canadian Government). He previously held senior government positions in natural gas, nuclear and uranium, petroleum, economic regulation, and environment. He has advised numerous governments and companies in North America, Europe, Asia, and Latin America. An Associate Fellow of Chatham House; academic coordinator/energy for the Club of Madrid; member of The Global Policy Council of Bertlesmann Foundation; and external reviewer to Emirates Centre for Strategic Studies and Research, he is the author of numerous papers, articles, and reports on energy, geopolitics, and geology. He has advanced degrees in geology from Queen's, Canada and the University of Washington, Seattle USA.

Paul Stevens, Senior Research Adviser, was educated as an economist and as a specialist on the Middle East at Cambridge and the School of Oriental and African Studies; from 1973–9 he taught at the American University of Beirut in Lebanon, interspersed with two years as an oil consultant; from 1979–93 he was a lecturer and senior lecturer in economics at the University of Surrey. From 1993 to 2008, he was

Professor of Petroleum Policy and Economics at the Centre for Energy, Petroleum & Mineral Law & Policy, University of Dundee, Scotland, a chair created by BP. In January 2008 he was appointed to an Emeritus Chair. He has now joined, on a part-time basis, Chatham House (The Royal Institute for International affairs) in London as Senior Research Fellow (Energy). His role is to take over the energy part of the Energy, Environment, and Development Programme. 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.

Silvana Tordo, Contributing Author, is a Lead Energy Economist at the Oil, Gas, and Mining Policy Division of the World Bank. Her area of focus includes upstream oil and gas sector policies and strategies, legal and institutional frameworks, fiscal terms and petroleum contracts, and petroleum revenue management. She is a co-author of the World Bank publication *Republic of Yemen: A Natural Gas Incentive Framework*.

Adair Turner, Contributing Author, is Chairman of the Financial Services Authority.

Philip Wright, Senior Research Adviser, is Honorary Professor of Energy Policy and Economics at the University of Sheffield and a Fellow of the Institute of Energy. Over more than two decades his research, publications, consultancy, and teaching have covered all the energy industries and the companies that operate in them. As well as contributing a critical perspective on the liberalization of gas and electricity industries, his recent work has also addressed the UK's oil and gas fiscal regime. 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 Montpellier¹ and at the University of Cartagena de Indias, Colombia. He currently works as an independent consultant and writer.

Ian Wybrew-Bond, Company Secretary and a Senior Research Adviser to the OIES. After a career in Shell, principally in its international natural gas business, he became a gas adviser to the OIES and co-edited and co-authored the publications *Gas to Europe and Natural Gas in Asia*. He was a non-executive director of Saipem and a Senior Associate with CERA for many years.

Lorian Yacoub, Contributing Author, is a Doctoral Researcher at the Management School, University of Sheffield. Her current research project, 'Reconstructing Oil Governance in Iraq' specifically looks at the distribution of revenues between the central and regional governorates.

Accounts

AUDITORS' STATEMENT ON SUMMARISED FINANCIAL STATEMENTS YEAR ENDED 31 DECEMBER 2011

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

We have examined the summary financial statement for the year ended 31 December 2011.

Respective responsibilities of trustees and auditors

The trustees are responsible for preparing the summary financial statement in accordance with applicable United Kingdom law. Our responsibility is to report to you our opinion on the consistency of the summary financial statement with the full annual financial statements, and its compliance with the relevant requirements of section 427 of the Companies Act 2006 and the regulations made thereunder.

We conducted our work in accordance with Bulletin 2008/3 issued by the Auditing Practices Board. Our report on the charity's full annual financial statements describes the basis of our opinion on those financial statements.

Opinion

In our opinion the summary financial statement is consistent with the full annual financial statements of Oxford Institute for Energy Studies for the year ended 31 December 2011 and complies with the applicable requirements of section 427 of the Companies Act 2006, and the regulations made thereunder.

Jonathan Cross FCA (Senior Statutory Auditor)
for and on behalf of Everett & Son
Chartered Accountants & Statutory Auditors
35 Paul Street
London
EC2A 4UQ

11th May 2012

	Unrestricted funds	Endowment funds	31.12.11 Total funds	31.12.10 Total funds as restated
	£	£	£	£
Incoming Resources				
Incoming resources from generated funds				
Voluntary income	583,937	-	583,937	464,553
Incoming resources from charitable activities	631,123	-	631,123	631,123
Incoming resources from investments				
Government Stocks	1,374	-	1,374	1,524
International Bonds	4,012	-	4,012	4,451
Corporate Bonds	48,350	-	48,350	30,019
Quoted Securities	85,353	-	85,353	77,547
Deposit account interest	148	-	148	3,068
Other incoming resources	5,500	-	5,500	5,500
Total incoming resources	1,359,797	-	1,359,797	1,277,241
Resources Expended				
Costs of generating funds				
Costs of generating voluntary income	23,214	-	23,214	14,744
Charitable activities				
Projects and publications	1,443,398	-	1,443,398	1,282,361
Governance costs	53,129	-	53,129	62,129
Other resources expended	-	-	-	15,433
Total resources expended	1,519,741	-	1,519,741	1,374,667
NET INCOMING/ (OUTGOING) RESOURCES	(159,944)	-	(159,944)	(97,426)
Realised gain/(losses) on investment assets	65,898	-	65,898	107,857
Net income/(expenditure)	(94,046)	-	(94,046)	10,431
Unrealised gains/losses on investment assets	(57,094)	(424,796)	(481,890)	533,161
Net movement in funds	(151,140)	(424,796)	(575,936)	543,592
RECONCILIATION OF FUNDS				
Total funds brought forward	2,251,761	3,259,466	6,054,819	5,511,227
TOTAL FUNDS CARRIED FORWARD	2,480,029	3,574,790	5,478,883	6,054,819

All incoming resources and resources expended arise from continuing activities.

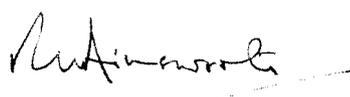
BALANCE SHEET AT 31 DECEMBER 2011

	Unrestricted funds	Endowment funds	31.12.10 Total funds	31.12.09 Total funds as restated
	£	£	£	£
FIXED ASSETS				
Tangible assets	48,085	-	48,085	66,347
Investments	1,989,420	3,116,659	5,106,079	5,633,961
	<u>2,037,505</u>	<u>3,116,659</u>	<u>5,154,164</u>	<u>5,700,308</u>
CURRENT ASSETS				
Debtors	6,393	-	6,393	12,418
Prepayments and accrued income	186,639	-	186,639	209,154
Cash at bank	224,723	33,335	258,058	240,087
	<u>417,755</u>	<u>33,335</u>	<u>451,090</u>	<u>461,659</u>
CREDITORS				
Amounts falling due within one year	(126,371)	-	(126,371)	(107,148)
NET CURRENT ASSETS/(LIABILITIES)	291,384	33,335	324,719	354,511
TOTAL ASSETS LESS CURRENT LIABILITIES				
	<u>2,328,889</u>	<u>3,149,994</u>	<u>5,478,883</u>	<u>6,054,819</u>
NET ASSETS				
	<u>2,328,889</u>	<u>3,149,994</u>	<u>5,478,883</u>	<u>6,054,819</u>
FUNDS				
Unrestricted funds			2,328,889	2,480,029
Endowment funds			3,149,994	3,259,466
TOTAL FUNDS			<u>5,478,883</u>	<u>6,054,819</u>

The summary accounts were approved by the Board of Trustees on 13th May 2011 and were signed on its behalf by:



A. Lajous – Trustee



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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:

- to appoint one or several representatives on the Board of Governors. This gives the Member an active part in the management and supervision of the Institute since the Board is the body empowered with all executive functions;
- to attend the Annual General Meeting of the Institute;
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The Honorary President is **Robert Mabro**

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The auditors are Messrs Everett & Son, of 35 Paul Street, London EC2.

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