



ANNUAL REPORT 2016



THE OXFORD
INSTITUTE
FOR ENERGY
STUDIES

Oxford Institute for Energy Studies



Annual Report 2016

About the Oxford Institute for Energy Studies

The Oxford Institute for Energy Studies (OIES), a non-profit making charity and Recognized Independent Centre (RIC) of the University of Oxford, was founded in 1982 as an independent centre for advanced research into the social science aspects of international energy.

In addition to conducting leading edge research on a wide range of current energy questions, the Institute is committed to exploring these through dialogue – between consumers and producers, government and industry and academics and decision makers. This is reflected in the membership of the Institute and in the diversity of its research team, drawn from different national, academic and professional backgrounds. Our aim is that co-operation between researchers and interaction with benefactors and external stakeholders, will lead to a more informed and balanced understanding of the behaviour, motivations and objectives of the various economic forces, agents and policy makers that operate in or influence the performance of international energy markets.

Research carried out at the OIES is designed to encompass the following disciplines:

- the economics of primary and secondary energy sources including petroleum, gas, coal, electricity and renewable energy;
- the economics of electricity market design and regulation of electricity networks;
- the evolution of oil and gas price formation, market structures and trading;
- the politics and social aspects of energy;
- the international relations of oil and gas producing and consuming nations;
- the economic development of oil-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 Institute concentrates on research in energy issues of international significance.



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Message from the Chairman

2016 was a turbulent year for the global energy scene. Oil and natural gas prices fell to 12 and 18 year lows respectively, the coal industry suffered as utilities shifted towards natural gas and renewables, and the end of 2015 saw the COP21 Paris Climate Conference, for the first time in over 20 years of UN negotiations, aim to achieve a legally binding and universal agreement on climate, with the objective of keeping global warming below 2°C.

Under these circumstances, the research and analysis carried out by the Institute, and the commentary it provides, are of special relevance. They contribute useful insights into the workings of energy markets and the prospects for meeting future energy demand, and provide deeper insight into the causes and the nature of some of the problems faced by the oil and gas industries.

I was pleased to see the Institute expand its activities and remain unique in conducting academic research at the highest standard focussed on the oil, gas and electricity industries, their markets, and the policies that affect them. I particularly commend the institute for its continued commitment to its electricity programme. 2017 will see the launch of a multi-year research project that will study the worldwide transformation of the electricity sector. Research will focus on the role and design of public policy, regulation and markets needed to support the transition, as well as the implications for end-users, companies and their business strategies.

Mention must be made of the continuing success of the Oxford Energy Seminar and the Oxford Energy Policy Club, sister organisations of the Institute, but constitutionally separate entities. Although they were founded at different times – 1976, 1979 and 1982, respectively – they share the same objectives: to promote through debate, teaching and research an understanding of international energy issues. The effective working relationships between these distinct organisations have contributed to their individual achievements and created a unique common offering.

The Institute's capacity to continue with its research activities depends on the continued generosity and support of its sponsors. We were therefore very pleased to welcome APICORP, Gunvor SA, S&P Global Platts, Statoil, the Swedish Energy Agency, Repsol, OMV and Vitol to the roll of our current sponsors.

On behalf of the Board of Governors I want to convey our appreciation to Mr Paul Westin, Swedish Energy Agency, on his resignation. I thank him for his support of the Institute's activities. I am pleased to welcome his replacement from the Swedish Energy Agency, Mr Mikael Toll and look forward to working with him.

The increased number of sponsors supporting the work of the institute in 2016 is testament to the hard work of the Director, Dr Bassam Fattouh, most ably supported by Kate Teasdale, the research team, and our other support staff. On behalf of the Board of Governors I thank them all.

Sadly 2016 also saw the passing of Robert Mabro, the founder of the Oxford Institute for Energy Studies, who died on August 2nd, 2016. Robert founded the Oxford Energy Policy Club in 1976, the Oxford Energy Seminar in 1979 and the Oxford Institute for Energy Studies in 1982.

Over his long career, Robert enriched our understanding of energy markets, the behaviour of the various players, the dynamics within OPEC, and the interaction between governments and oil companies. With his writing and through the various institutions he created, he persistently tried to bring producers and consumers closer together, despite his recognition of the challenges involved and the wide divergence of interests.

He was a diplomat, interlocutor, friend, and above all, a generous intellectual and thinker whose deep insights and integrity will continue to shape and influence our ideas.

He built a truly remarkable and dynamic institution in OIES; it provides a unique atmosphere for reflection and an arena for the rare opportunity to engage in honest intellectual debate. He leaves behind a legacy of iconic accomplishments in the field and an emptiness in the hearts of all those who came to know him.

He will be dearly missed and we are privileged to carry on his legacy.

Roger Ainsworth

March 2017

Director's Note

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

Programmes

The Oil and the Middle East Programme and Natural Gas Research Programme are well established and continue to produce high quality research of international significance as well as work with a more regional and national focus.

The Electricity Programme was established in 2015 and the quality and quantity of its research output bely the size of the programme. I commend Rahmatallah Poudineh, his team, and contributing authors, on the excellent work and the speed with which they have established a programme of electricity research in an arena that already has many research players. Additionally, 2017 will see the launch of a multi-year research project that will study the worldwide transformation of the electricity sector. Research will focus on the role and design of public policy, regulation and markets needed to support the transition, as well as the implications for end-users, companies and their business strategies.

2016 saw the launch of the Africa Oil and Gas Programme, led by Luke Patey. The programme is committed to providing an in-depth understanding of the current trends shaping Africa's energy industry, from a national and regional perspective, and deep analysis on the main political, socio-economic, and security risks facing the oil and gas industry in African countries.

Historically, Africa has been one of the world's most neglected energy provinces. In large part this has been because of its relatively small reserves of oil and natural gas – despite notable exceptions such as OPEC members Nigeria, Angola, Algeria and Libya. However, new discoveries, particularly in Africa's formerly hydrocarbon-poor east, have sparked a new wave of developments that are likely to change the face of Africa as an energy producer.

Research and Dissemination

The institute publishes a range of research publications and commentaries, all of which are made freely available on its website, with the exception of published books. This report highlights a selection of the papers published by the institute in 2016 on a wide range of subjects. In addition to research papers, the institute publishes 'Energy Comments': shorter papers, often devoted to current policy issues. The institute also publishes a quarterly magazine, the *Oxford Energy Forum*, now in its 27th year.

Staffing

In 2016, we were joined by Thierry Bros, Laurence Harris and Luke Patey as Senior Research Fellows and we bade farewell to Laura El-Katiri, who relocated to the Middle East.

Thierry Bros joined the Gas Programme as Senior Fellow. Prior to that he was, from 2010 to 2016, Senior European Gas and LNG Analyst for Société Générale. He joined Société Générale in 2007 as a Senior Financial Analyst to provide recommendations on listed pan-European gas stocks and in-depth research on gas issues. From 2002 to 2007, Thierry was a Senior Oil & Gas expert at the French Ministry of Economy, Finance and Industry, where he represented France on oil markets and advised on emergency issues at the International Energy Agency, the European Commission and the Energy Charter. His responsibilities included providing global oil and gas industry reviews to senior French officials and negotiating European directives. As a gas specialist, he reviewed the regulations governing the liberalisation of the French gas market and supervised the Contingency Gas Plan. Prior to that, Thierry worked, for eight years at IFPEN, an oil & gas research institute. Thierry Bros holds a Master of chemical engineering from ESPCI ParisTech and a PhD from Ecole Centrale Paris.

Luke Patey joined us to be Lead Senior Research Fellow of the fledgling Africa Oil and Gas Programme. He is also senior researcher at the Danish Institute for International Studies and fellow at the Rift Valley Institute. Patey is author of *The New Kings of Crude: China, India, and the Global Struggle for Oil in Sudan and South Sudan* (Hurst, 2014), which was short-listed for the Africa-Asia Book Prize, and co-editor of *Sudan Looks East: China, India, and the Politics of Asian Alternatives* (James Currey, 2014) with Daniel Large.

Laurence Harris joins us as Senior Fellow and his research focus is on the increasingly important subject of Africa's energy issues and policy. Laurence is also Professor of Economics at SOAS, University of London where he was the founding head of the Department of Financial and Management Studies.

The OIES-Saudi Aramco Fellowship, made possible by the generosity of Aramco Overseas Company, attracted numerous applications in 2016. Three OIES-Saudi Aramco Fellows joined us: **Ferdinand Eibl** whose research lies at the intersection of politics and economics, in particular in the areas of distributive politics, social policies, cronyism, and trade in the Middle East and North Africa. More recently, he has started to work on civil-military relations and coups, and the electoral sociology of Islamism. His work has been published, amongst others, in *Studies of Comparative International Development* and the *European Political Science Review*. He holds an MPhil in Modern Middle Eastern Studies and a PhD in Politics from the University of Oxford; **Joel Krupa** is an interdisciplinary doctoral researcher at the University of Toronto, with a special emphasis on renewable energy finance. He has several years of strategic advisory experience in the private sector (real asset development, consulting, private equity), and spent a year crafting policy in a government role. He has presented on various energy issues at many conferences and events across North America, and has conducted analyses on energy issues from four different continents. Joel is a member of the University of Toronto's Institute for Sustainable Energy, and holds degrees from the University of Oxford, the University of London (London School of Economics), and the University of British Columbia. He is also a Chartered Alternative Investment Analyst; and **Tom Moerenhout** is a PhD Candidate at the Graduate Institute for International and Development Studies in Geneva, Switzerland. His dissertation is on the political economy of resource valuation reform, with a specific focus on energy subsidy reform in MENA countries. He is also an associate at the Global Subsidies Initiative (GSI) of the International Institute for Sustainable Development (IISD). Before joining as an OIES-Saudi Aramco fellow, Tom was a visiting research fellow at Columbia University's Political Science Department and Center for Global Energy Policy. Tom is mainly interested in resource valuation and regulation, and the role of trade, investment and subsidy policies in sustainable development. He has a keen interest in international economic law and behavioural economics, which he integrates in both his research programmes and PhD dissertation. At GSI, Tom cooperated and managed (research) projects commissioned by, among others, the World Bank, OECD, IRENA, UNEP, OPEC, ICTSD, WTI, GIZ, Nestle and Greenpeace. He has worked on institutional and policy reform related to fossil fuels, renewables and biofuels.

We were also pleased to welcome Trisha Curtis, Florence Geny, Richard Mallinson, Tatiana Mitrova, Jun Rentschler and Manal Shehabi as research associates. In addition we welcomed five visiting researchers during the year: **Vija Pakalkaite**, a third year Public Policy PhD student at Central European University's (CEU) Doctoral School of Political Science, Public Policy, and International Relations in Budapest; **Hannes Tordengren and Piotr Rozwalka** both graduate economics students at the Stockholm School of Economics and are working on a master thesis under the title: The impact of natural gas subsidy reform on household gas consumption in Ukraine; **Andrea Prontera** an Assistant Professor of International Relations and EU Institutions and Policies at the University of Macerata (Italy), working on a book on the transformation of the politics of energy security in the European Union and **Noor Al-Mesad** an Economics PhD Student of the Stony Brook University of New York.

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

- **Luis Boscán**, PhD fellow, Copenhagen Business
- **Roberto Brandt**, a senior international energy consultant, with 38 years of experience in corporate, public policy, consulting and academic activities.
- **Anne-Sophie Corbeau** is a Research Fellow at KAPSARC specialising in global gas markets.
- **Chris Caswell**, Director – LNG and FLNG, Engineering and Construction, KBR, in Houston.

- **Sylvie d'Apote**, an energy economist with over 20 years of experience as an international energy consultant, spanning the whole energy spectrum from oil and gas to coal and biomass.
- **Andreas Economou**, a Doctoral Researcher at UCL Energy Institute, University College London and past OIES-Saudi Aramco Fellow
- **Peter Findlay**, Vice President and energy lead of a business modelling practice in Calgary.
- **Harald Heckling**, Researcher at ewi Energy Research & Scenarios.
- **Tooraj Jamasb**, Chair in Energy Economics, Durham University Business School.
- **James T Jensen**, President of Jensen Associates, a consulting firm in Weston, Massachusetts.
- **Martin Kornejew**, Stockholm University, Sweden, and Christian Albrechts Universität Kiel, Germany
- **Ken Koyama**, Managing Director, Chief Economist, Strategy Research Unit, IEEJ in Japan.
- **Mario Mansour**, Deputy Chief, Tax Policy Division, Fiscal Affairs Department, International Monetary Fund, Washington
- **Carole Nakhle**, Director, Crystol Energy, London
- **Rabindra Nepal**, Lecturer in Economics, CDU Business School, Charles Darwin University
- **Alessandro Rubino**, Research Fellow in Economics, University of Bari
- **Florian Weiser**, Researcher at ewi Energy Research & Scenarios

Activities and Events in 2016

The annual 'Gas Day', held in October 2016, was filled to capacity, as was the 2016 'Oil Day' – kindly supported by Aramco – entitled 'Navigating the Oil Market's Rebalancing: Setting the stage for the next price spike'.

The Institute's annual 'Brainstorming Meeting' took place in Edinburgh in May; we are very grateful to Argus Media and SPOL for their generous sponsorship and support of this event.

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

General

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

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

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

March 2017

Research

The institute publishes a range of research publications and commentaries, all of which are made freely available on its website, with the exception of published books. This report highlights a selection of the papers published by the institute in 2016 and provides an overview of ongoing research. For a full list of published research in 2016, please see the end of this report or visit the OIES website, where a full list of published and planned research can also be accessed.

Established in 2009, the Oil and the Middle East programme's research activities are organised around its four thematic areas: global oil market dynamics; production; policy and the economics of resource-rich countries; and, consumption and the development of emerging energy markets.

'Global oil market dynamics' encompasses the study of oil price cycles, the evolution of pricing benchmarks, the behaviour of oil market participants, the impact of new supply sources on market dynamics, producer-consumer relations, and international oil and product trade flows. Much of 2016's research output under this theme dealt with understanding the recent oil price downturn and market rebalancing mechanisms. An early paper looking at whether the recent oil price cycle was structurally different from previous cycles, and its associated implications, was followed by a more technical paper later in the year which introduced a new measure to disentangle positive and negative oil supply shocks into exogenous (caused by events outside the oil market) and endogenous (as a consequence of normal market functioning), showing that the supply side of the market has historically been an important determinant of the price of oil. The historic 2016 accord between OPEC and non-OPEC producers to 'freeze' oil output was also the focus of several publications by oil programme researchers, reflecting our historical expertise on oil market analysis.

The focus of our second thematic area, 'production', relates to the economic prospects for conventional and unconventional production in the world's major producing economies, as well as newly emerging provinces. Research published under this theme in 2016 was diverse yet comprehensive, spanning the Middle East and North America. A paper published early in the year covered the development of hydrocarbon resources in the Kurdish Region of Iraq and implications for the wider region. Another significant paper looked at the prospects for Iraqi oil production to sustain its unexpected surge in 2015, following years of disappointing growth. Following 2015's seminal paper on US shale oil, the programme also published a paper assessing the precise nature of productivity gains in US shale, disaggregated between cost cuts, efficiency gains and technological advances, contributing further to our understanding of the dynamics of this important unconventional resource. Another paper on North America focused on the future of Canadian oil sands, which have been overshadowed by the tight oil 'revolution' in the US, but could yet play a prominent role in meeting future global demand to 2035 and beyond.

A substantial portion of the programme's 2016 research on 'policy and the economics of resource-rich countries' focused on the wave of energy reforms triggered by fiscal crises and the oil price downturn in the Middle East and North Africa (MENA). This included papers analysing energy pricing reforms in the Gulf Cooperation Council (GCC) countries and their implications for the 'social contract', as well as papers focusing in-depth on country-specific reform policies – notably, Saudi Arabia's unprecedented 'Vision 2030' and its implications for the Kingdom's oil and energy policy. Another important paper focused on the impacts of energy price reforms on firms, in a break with the traditional focus on households. This identified specific channels through which the effects of reforms are transmitted to firms, and the response mechanisms available to them. Another growing focus of this thematic area relates to domestic demand growth, diversification, and the deployment of renewables. The programme published two important papers in this area: the first developed a framework for advancing renewables in resource-rich MENA countries, allowing the latter to draw from international experience but also tailor this to their own specific contexts. The second paper in this area focused on opportunities and barriers to cooperation between the GCC and East Asian countries in the fields of nuclear and renewable energy. The continuing evolution of our research in this thematic area showcases the programme's unique strengths in understanding this vital region.

The programme's final thematic area 'consumption and the development of emerging energy markets' focuses on emerging centres of energy demand outside traditional OECD energy consumers. In 2016, we expanded our

work on China and India, which stood out as key drivers of non-OECD oil demand growth. We published an important paper arguing that oil demand growth in India is poised for a 'take-off' based on historical trends in per-capita income, which will be underpinned by an exponential rise in vehicle ownership, an increased share of manufacturing in GDP, and infrastructure development. However, the paper cautioned that this growth will be tempered by a simultaneous shift in preference towards cleaner fuels and environmental concerns. Papers published on China focused on a variety of issues; the impact of the oil price downturn on China's loans for oil and equity investments – potentially turning them from assets into liabilities; the implications of China's 13th Five Year Plan for its energy demand, and by extension, for global oil markets; and the structure of China's oil industry and NOC-government relations, in light of plans for oil industry liberalisation.

The programme will continue to build on its core research capabilities in 2017, whilst simultaneously expanding into important new areas of research including oil demand in transportation, and the continuing evolution of renewables policy in the MENA countries.

In late 2016, OIES launched a dedicated Africa oil and gas programme. Its initial research focus is on up and coming oil and gas producers in East Africa, the impact of lower global energy prices on large producers in west and south Africa, and the activities and strategies of Chinese, Indian, and other Asian investors on the continent.

Research in 2017 will include work on the prospects and risks for current and future oil producers in East Africa, an outlook on the direction of Angola's oil industry after the fall in global oil prices, and the potential for oil development in Ethiopia as a new frontier on the African energy scene.

The Natural Gas Research Programme, launched in 2003, has become one of the foremost sources of independent academic research on natural gas. The programme focuses on natural gas within the disciplines of the OIES: economics, politics and sociology, international relations of gas-producing, consuming and transit countries, as well as the environment in its relationship with natural gas.

The Gas Programme's most significant publication in 2016 was a new book entitled "LNG Markets in Transition: The Great Reconfiguration". Edited by Anne-Sophie Corbeau and David Ledesma, the book was a collaboration with KAPSARC and provided a very timely analysis of the significant changes taking place in the global LNG market. New supply from the US and Australia is arriving into a market where demand is failing to meet expectations and where pricing mechanisms are changing away from the traditional oil-linked model towards a more market-based approach. The combination of these factors, and questions over the future economics of LNG supply, have caused great uncertainty in the gas market, and our publication aimed to both elaborate on the new risks and also to enhance understanding of the future prospects for LNG.

Our more traditional research output encapsulated a large number of papers on a variety of gas themes. Our strength in Russia and CIS analysis was reflected in various papers on Russian gas exports and transit issues. An early paper on Gazprom's pricing strategy was followed by a detailed analysis of the transit issues for Russian gas crossing Ukraine and focused on the key issue of contract renegotiations in 2019. We also covered the Azeri gas sector, and questioned whether there would be sufficient production to support any growth in the "Southern Corridor" which might compete with Russian gas in Europe. We also explored the gas dynamics in the Baltics, and in particular how Lithuania is using EU energy policy tools to diversify its supply away from Russia.

Our analysis of the European market was particularly focused on trading and infrastructure issues this year. We explored the expanding influence of European gas hubs, updated our regular analysis of the correlation between gas exchange prices in Europe, and published a joint paper with EWI which used their TIGER model to analyse potential bottlenecks in European infrastructure as the EU's energy diversification policy encourages greater use of LNG.

Elsewhere, we expanded our coverage of the Asian gas market with a paper on Asian gas demand, providing an overview of the regional outlook as well as snapshots of individual countries. We also looked at new trends in Japanese LNG strategy, as energy deregulation starts to have an impact, and we are continuing to expand our coverage of China by establishing contacts and research partnerships there.

We published two important papers on South America, one of which analysed the potential for LNG demand in the region and one which focused more specifically on the prospects for unconventional supply in Argentina.

The conclusions suggest that the overall outlook for gas in the region is positive, although weather dependent, as gas is often used as a back-up fuel when hydro fails. If countries such as Argentina, which has vast shale gas potential, can develop indigenous resources, then the incentive to increase gas demand will grow.

Finally, we have started 2017 by introducing an important new theme to our research analysing the future of gas in a decarbonising global energy economy. The first paper, entitled “The Future of Gas in a Decarbonising European Energy Strategy” asks significant questions about whether and how gas can prosper in the face of an EU strategy that is much more focused on renewables. Throughout the year we will be addressing a number of key themes that have emerged as possible answers both for the European market and for other regions. In particular, we will analyse potential new markets for gas, the future of CCS technology, methane leakage issues, the future of biogas, the potential for gas in the power and heating markets in Europe and the continuing issues around security of supply.

The OIES Electricity Research Programme was established in 2015. The Programme seeks to inform public and private sector decision-making through improved understanding of the electricity supply chain, drawing on economics and other social sciences.

Our research addresses the key issues in the power sector and reflects the unique characteristics of the Institute and its staff. In particular, we pay special attention to public policy issues such as the tensions between liberalisation and de-carbonisation in the electricity sector. Our research in 2016 focused on four topics: electricity market design, the gas-to-power market, regulation and power sector reform and renewable policy. Altogether, we published six papers in 2016 (including a paper published in collaboration with oil programme).

Within the theme of electricity market design, we published a significant paper arguing that European markets are broken. The market’s ills can be seen in the fact that wholesale prices are falling even as generation costs are rising, plants are closing early, utilities are financially stressed, and policymakers expect those utilities to carry out their biggest investment programme in history to meet carbon targets. The paper evaluates the main available solutions to fix electricity markets and also puts forwards a new two market solution.

Another paper published within this theme deals with the important issue of flexibility in the power system. It contends that as the share of intermittent renewable energy increases in the generation mix, electricity systems are exposed to greater levels of uncertainty and risk for which more flexibility is needed. It focuses on provision of flexibility from small resources and proposes a model contract for flexibility services.

Continuing our gas-to-power market coverage, we published a paper in 2016 that considers the institutional arrangements for investment in Tanzania’s power sector. It surveys the track record (and possible bottlenecks) in funnelling investment to the sector, with special attention to the gas sector, given the power sector’s planned reliance upon natural gas as a generation fuel.

We published two papers on regulations and power sector reform. The first paper focuses on assessing empirical evidence for the efficacy of relying on the standard model of power sector reform in Non-OECD Asia. It concludes that uniform application of the standard model without reference to the heterogeneity of the countries is unlikely to produce the desired result. The second paper looks at the business model for cross-border interconnection in the Mediterranean basin. It argues that applying the EU regulated model or Merchant Transmission Initiative are not likely to be the right choice for the region given its peculiar context. It concludes that a hybrid model which combines the best features of those two approaches is likely to produce better results.

Finally, in collaboration with Oil and Middle East programme we published a paper on renewable energy policy in the MENA region. The paper reviews the policy choices available to heavily subsidised resource-rich MENA countries to integrate renewables. It asserts that the most efficient and effective way to incentivise investment in renewable energy is an approach that combines a partial fuel price adjustment and a partial subsidy programme.

In 2017, we will continue to work on electricity markets, decarbonisation challenges, renewable and fiscal policy for decarbonisation, and innovation. We expect to publish papers that deal with financing renewables, gas-to-power markets in developing countries, decarbonisation challenges in Spain and the UK, energy sector fiscal reform, and innovation for network utilities.

As part of the Electricity Programme, in 2016, we planned for a multi-year project with a focus on decentralisation and decarbonisation. The purpose of this multi-year Electricity Research Project is to contribute to and shape the debate about the significant transformation currently happening in the electricity sector. The project is international in scope but in the first year we will be concentrating on Europe given that it is the first region having to address the significant penetration of intermittent renewable energy and greater consumer participation. Going forward, work on the EU will continue, and research streams for other regions where OIES has deep expertise will be added, including the US, China, India, Latin America, the Middle East and North Africa.

Following the publication at the end of 2015 of 'Europe's Long Energy Journey - towards an Energy Union?', written with Malcolm Keay, David Buchan continued throughout the year to track and analyse the (rather slow) progress of the energy union project and to examine the energy policy consequences, both for the UK and the EU, of Brexit.

The project has seven sponsors from a diverse group of companies and organisations. In order to discuss the project's progress and to plan the research topics and events for the following year, we have planned two electricity events for this year. On Tuesday 7th of November 2017, we will hold a sponsors' meeting at the OIES. The following day, on Wednesday November 8, we will hold our first annual Electricity Day.

Journal and Website

Oxford Energy Forum

The institute's quarterly journal, now in its 27th year, continues to tackle topical issues facing the energy world. Issues covered in 2016 included: LNG Markets, the Paris Agreement, the transformation of the electricity sector and energy trading. Our thanks go to the authors of all articles that appeared in OEF in 2016, to the editor, Bassam Fattouh, and to our guest editors.

Website – www.oxfordenergy.org

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

The catalogue of papers and comment pieces on the OIES website continued to grow during 2016 with over forty new publications added.

There are now nearly 4,000 subscribers to the institute's publication notification email service, an increase of 33 per cent on the previous year. Visitor numbers to the website remained steady at 99,000 in 2016, and total traffic to the site was close to half a million visits, drawn from all but seven countries of the world. The Institute's Twitter following increased by 15 per cent in 2016 to nearly 3,400 followers and the Institute's LinkedIn page has 2,500 followers.

In 2016, the Institute was mentioned in the press, on average twice per day, by, amongst others; Bloomberg, The FT, Platts, Reuters, The Times, Energy Intelligence, MEES, The Gulf Times, Interfax, The New York Times, Nezavisimaia Gazeta, China Energy News, The Telegraph, the Wall Street Journal, Dow Jones News and Petroleum Economist.

Lectures and Seminars

As part of its commitment to education and its mandate to promote scholarly cooperation between energy producers and consumers, the OIES strives to disseminate the results of its research as widely, and in as many ways, as possible. Lectures and seminars enable the Institute's researchers to present the findings of completed projects and to expose work in progress to the criticism of colleagues in industry, government, and academia. In 2016, the Institute's research fellows, director, and programme directors gave numerous presentations and talks at many conferences, workshops, seminars, and meetings across the globe.

Seminars

The OIES hosted 10 seminars during 2016 on a wide range of subjects, including assessing the accuracy of electricity production forecasts in developing countries, implications of Brexit for energy, the outlook for UK oil and gas and the impact of sanctions on the Russian energy sector. The seminars, which are open to all and advertised on the University of Oxford's energy website, included presentations from invited speakers and also from OIES research fellows on their work in progress. Our thanks to all speakers in 2016.

XXVII Annual Brainstorming Meeting

Since 1990, the institute has been holding an annual 'Brainstorming Meeting', which draws together people from producing and consuming countries, national and private oil companies, governments, financial institutes, and other research organisations. The 27th such meeting was held 26-27 May in Edinburgh, Scotland with the kind support of Argus Media and SPOL. Participants engaged in lively discussions on a wide range of energy issues, including: the world economy; the geopolitics of energy; the oil market; the change in regulatory landscapes and benchmarks; gas and LNG pricing and implications of COP21 for energy markets.

2016 Oil Day – Navigating the Oil Market's Rebalancing: Setting the stage for the next price spike

In November 2016, the OIES successfully held its annual 'Oil Day'. This year's event, kindly supported by Aramco, the King Abdullah Petroleum Studies Research Centre (KAPSARC) and the Clingendael International Energy Programme (CIEP) focused on four main themes: The prospects for non-OPEC supply growth and investment outside North America; the US shale supply and investment response in a low price environment: what have we learnt so far?; the Middle East investment cycle: the limit to increases in productive capacity; and the investment cycle in the oil sector: is it really different this time?

The conference was attended by 30 key oil industry figures, representatives from IOCs, NOCs, financial institutions, price assessment agencies, the energy business community, as well as OIES staff.

2016 Gas Day

The OIES Natural Gas Research Programme held its eleventh annual 'Gas Day' in October 2016, with three sessions dedicated to discussing current issues in the gas sector. The first session focused on the outlook for European supply, covering the decline in indigenous production and the prospects for imports from various sources. It also considered the impact of renewables on European gas demand. The second – entitled 'LNG Markets outside Europe' – discussed the prospects for demand in Asia, Latin America and other emerging markets, while also considering the competition from coal and the prospects for new LNG supply in the 2020s. The final session was called "European Price War or Global Price War" and discussed the prospects for increased gas-on-gas competition in the global gas market, and debated whether Russian gas could be price competitive with the emerging wave of LNG developments. The event, held at St Anne's College, Oxford, was attended by over 90 invitees, including sponsors of the OIES and the Natural Gas Research Programme and invited guests from the academic, media, and corporate sectors.

Gas Programme Sponsors' Meetings

The OIES Natural Gas Research Programme held its bi-annual sponsors' meetings on 26-27 April and 11-12 October 2016 at St Hugh's College, Oxford. The meetings, attended by the gas programme's sponsors and

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

The April meeting initially focused on a presentation of the key findings from our new book “LNG Markets in Transition”, published in partnership with KAPSARC. The two editors and a number of the authors presented their analysis and conclusions, followed by a general discussion. Other research topics discussed included: Russia and CIS gas markets, European gas pricing and demand, the Netherlands gas market, the Indian gas market, an introduction to the OIES Electricity Programme and a discussion of a joint project between OIES and EWI on pipeline flows in Europe. A workshop to discuss the details of a new model generated from this partnership was held after the formal proceedings were concluded.

The October meeting focused on a number of new papers and work in progress, with topics including: Gas in the German Energy Mix; a European trading update; the future of Azeri gas production; an update on Ukraine gas issues, including the transit of Russian gas to Europe; the future for Algerian gas exports; unconventional gas in Argentina; and the role of LNG in the Latin American gas markets. At both meetings, Bassam Fattouh also presented an update on the global oil market, which is always a highlight for the sponsor group.

Library

2016 saw the majority of the library project completed. Over 6,500 books specific to energy are now available to search through the library's online catalogue (OLIS). Approximately 20,000 periodicals, newsletters and statistical publications have also been added to OLIS. Of these items, over 600 were borrowed during the year, an increase of 200 from 2015.

The Institute's ongoing commitment to provide a unique leading resource in energy publications continued through 2016 with 130 publications being added to the collection. New online journal and newsletter subscriptions were also added. A donation of 82 nuclear economics publications from a retired engineer were brought into the collection.

New visitors continued to discover OIES and its library by way of OLIS, where it fills a hole in the academic library collections that is not served by other university libraries. Requests were being made by other university libraries throughout the UK and abroad for material held by the OIES library and made discoverable through OLIS.

Use of the library continued to grow by way of loans and by about 50 requests made for information sourced from databases, journals, archives and individuals. The majority of use came from OIES researchers.

OIES would like to offer thanks to the following organisations and publications for supplying – either free of charge or at substantially discounted prices – important trade journals, statistical sources, and other materials vital to our research work, which could not have been afforded otherwise: *Argus Media, Blackwell's, Energy Charter Secretariat, Gas Strategies, Geoffrey Greenhalgh, Institute of Energy Economics - Japan, Live Media & Publishers - India, MEES and Natural Gas World Magazine.*

Research Team and Staff

Christopher Allsopp CBE, was Director of the institute from 2006 to 2013, he is emeritus fellow of New College, Oxford; editor of the Oxford Review of Economic Policy; a director of Oxford Economic Forecasting; and author of the Review of Statistics for Economic Policymaking – also known as ‘The Allsopp Review’. He has previously worked at HM Treasury and the OECD, while at the Bank of England he was an adviser (1980–83) and a member of the Court of Directors (1997–2000) and of the Monetary Policy Committee (2000–03). He has had extensive involvement with domestic and international policy issues as a consultant to international institutions and private-sector organisations, and has published extensively on monetary, fiscal, and exchange rate issues, as well as the problems of economic reform and transition. His involvement in the economics of oil and other energy issues goes back to the shocks of the 1970s.

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

Thierry Bros, Senior Research Fellow, joined the institute in October 2016. Prior to that he was, from 2010 to 2016, Senior European Gas and LNG Analyst for Société Générale. He joined Société Générale in 2007 as a Senior Financial Analyst to provide recommendations on listed pan-European gas stocks and in-depth research on gas issues. From 2002 to 2007, Thierry was a Senior Oil & Gas expert at the French Ministry of Economy, Finance and Industry, where he represented France on oil markets and advised on emergency issues at the International Energy Agency, the European Commission and the Energy Charter. His responsibilities included providing global oil and gas industry reviews to senior French officials and negotiating European directives. As a gas specialist, he reviewed the regulations governing the liberalisation of the French gas market and supervised the Contingency Gas Plan. Prior to that, Thierry worked, for eight years at IFPEN, an oil & gas research institute. Thierry Bros holds a Master of chemical engineering from ESPCI ParisTech and a PhD from Ecole Centrale Paris.

Thierry is the author of the book “After the US Shale Gas revolution” (2012). He is a member of the EU-Russia Gas Advisory Council and an advisor for the World Energy Council – Global Gas Centre. He is also a visiting professor at SciencesPo Paris and a senior expert at Energy Delta Institute. Thierry regularly presents his research results at conferences.

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

Laurence Harris, Senior Research Fellow, is Professor of Economics at SOAS, University of London where he was the founding head of the Department of Financial and Management Studies. At the Oxford Institute for Energy Studies his focus is on the increasingly important subject of Africa’s energy issues and policy.

Laurence Harris’s other research interests, on which he has published many books and articles, are in finance, banking, macroeconomics, and development economics, and at OIES he is concerned with their connection to energy policy. His policy research has related principally to South Africa and sub Saharan Africa.

Professor Harris is a Fellow of the Academy of Social Sciences, UK; a Non-resident Senior Research Fellow of the United Nations University, World Institute of Development Economics Research; and a senior member of the African Economic Research Consortium. Laurence Harris is an alumnus of the London School of Economics. He has held faculty positions at LSE; the University of California, Berkeley; Harvard University; Birkbeck College, University of London; The Open University; and University of Zimbabwe. He has held visiting research positions at the International Monetary Fund; University of Cambridge; University of Rome 'Tor Vergata'; and Kobe University, Japan.

Patrick Heather, Senior Research Fellow, joined the Institute in June 2006. His works include: 'The Evolution and Functioning of the Traded Gas Market in Britain' (August 2010); a co-authored comment with Jim Henderson, 'Lessons from the February 2012 European gas crisis' (April 2012); and the paper 'Continental European Gas Hubs: are they fit for purpose?' (June 2012). His paper, 'The evolution of European traded gas hubs' (December 2015) focused on the evolution of the gas markets across the continent in the context of the European Commission's vision of a Single Energy Market (in gas); the paper described the 'path to maturity' of traded gas hubs and analysed their stages of development using both objective and subjective measures; he has since brought the results of that research up to date in a co-authored Insight with Beatrice Petrovitch, 'European traded gas hubs: an updated analysis on liquidity, maturity and barriers to market integration' (May 2017). Since 2004, Patrick has been an independent consultant focusing on the gas market evolution in Europe, supply and demand dynamics, the impact of regulation on market outcomes, contracting strategy, and marketing strategies to take advantage of new market opportunities. Patrick has advised and given presentations to many different organisations, including the European Commission, the APX and ICE futures exchanges and various producer and end user companies, financial institutions, regulators, and governments in Australia, Austria, Brazil, Britain, China, Estonia, France, Greece, Holland, India, Italy, Japan, Norway, the Philippines, Poland, Russia, Sweden and Turkey. In 2006, he was appointed commercial adviser to South Hook Gas to assist them through the long commissioning phase of their world-leading LNG import facility in South Wales, which was successfully achieved in 2009. Patrick has over 35 years' experience of broking, trading, and risk management in the natural gas, power, oil, and oil products markets, and working as a gas market expert for European utilities and gas suppliers, British investment banks, and international oil majors.

James Henderson, Director Natural Gas Programme, succeeded Howard Rogers as Director of the Natural Gas Research Programme in October 2016 having joined the institute in 2010 as Senior Research Fellow contributing works for the Gas and Oil Programmes covering Russia and CIS issues as well as global energy matters that affect the region.

James Henderson has been analysing the Russian oil and gas industry for the past 20 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 Head of Equity Research. Having returned to the UK in 2002 he became Head of Russia at Lambert Energy Advisory while also studying for his doctoral thesis on partnership in the Russian oil and gas industry at the University of London, which he completed in 2010.

He is a BP Professor of Energy at the Skolkovo Management School in Moscow and lectures on energy issues at a number of universities in Europe. His publications include numerous papers on the Russian oil and gas sector, a 2010 book entitled "Non-Gazprom Gas Producers in Russia", the co-editing of "The Russian Gas Matrix: How Markets are Driving Change" for OIES and the recently published "International Partnership in Russia".

Anouk Honoré, Senior Research Fellow, joined the OIES Natural Gas Research Programme in 2004. Her research focuses on European natural gas issues, with particular emphasis on the gas market fundamentals, energy policies, and power generation. Her main areas of expertise include building scenarios on natural gas demand and supply in 36 European countries (the 28 member countries in the European Union plus Albania, Bosnia and Herzegovina, Norway, Republic of Macedonia, Serbia, Montenegro, Switzerland, and Turkey). She also works on the natural gas markets in South America (Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, Peru, Uruguay and Venezuela). She is the author of various research papers and book chapters, with her own book *European Natural Gas Demand, Supply and Pricing: Cycles, Seasons and the Impacts of LNG Price Arbitrage* published by the Oxford University Press in 2010. Before joining the institute, she worked at the International Energy Agency (IEA) in Paris. Her work focused mainly on natural gas issues in the IEA 29 member countries, but also in China and in Latin America. Dr Honoré holds a PhD in economics, an MA in environmental and natural resources economics, and an LLM in international administration (public law) from Universities in Paris.

Malcolm Keay, Senior Research Fellow, joined the OIES in January 2005. His career has ranged widely across the energy scene, including roles in: the public sector, as director of energy policy at the UK DTI (1996–1999) and division head at the International Energy Agency; the private sector, as senior managing consultant at Oxera; and the non-profit sector, working at Chatham House and the World Coal Institute. He has acted as an adviser for many energy studies, including as special adviser to a House of Lords committee inquiry into energy security in Europe, and director of the energy and climate change study for the World Energy Council. His research focuses on the implications of electricity market liberalisation for the achievement of key energy policy objectives, particularly in relation to the environment. He contributed the chapter entitled ‘Can the Market Deliver Security and Environmental Protection in Electricity Generation?’ to *UK Energy Policy and the End of Market Fundamentalism*, edited by Ian Rutledge and Philip Wright (OUP, 2011). It updated the analysis and conclusions of his 2006 monograph, *The Dynamics of Power*, to argue that governments have failed to develop policies which will enable them to meet their environmental targets in the context of liberalised markets, and that more interventionist approaches would be needed. His research interests also include EU energy policy; with David Buchan, he co-authored a book published by OUP in 2016 on *Europe’s Long Energy Journey: Towards an Energy Union?*

David Ledesma, Senior Research Fellow, is an independent gas and LNG consultant focusing on gas and LNG strategy along the value chain, including the structuring of commercial arrangements, financing, and markets for pipeline gas and LNG projects. Since joining the institute in November 2007, he has contributed chapters to several of the institute’s books, namely: *Natural Gas in Asia* (2008), *Natural Gas in the Middle East and North Africa* (2011), *The Pricing of Internationally Traded Gas* (2012) and was Co-Editor of the institute’s recent book *LNG Markets in Transition, The Great Reconfiguration* (2016). He has also published a number of papers, including: ‘The Changing Relationship between NOCs and IOCs in the LNG Chain’ (July 2009); ‘East Africa Gas – Potential for Export’ (March 2013); and ‘The Future of Australian LNG Exports: Will Domestic Challenges Limit the Development of Future LNG Export Capacity?’ (September 2014). David also contributed the chapter ‘Project Financing LNG Projects’ to *The Principles of Project Finance* (Gower Publishing, 2012). David also gives numerous commercial training courses on gas and LNG in the UK and overseas, writes on gas and LNG, and presents regularly at conferences. During 30 years in the energy and utilities sector, David has worked on the development of complex integrated energy projects, negotiations at government level, and in the management of joint ventures. With Shell, he worked in Malaysia and the Netherlands, travelled extensively to Oman and Asia, and was a key member of the team that closed a major LNG project in the Middle East. He is an experienced commercial manager with hands-on experience developing and closing commercial gas transactions as well as developing business strategy. From 2000 to 2005, as director of consulting then managing director of the Gas Strategies Group (formally EconoMatters Ltd), David worked on and managed LNG and gas consulting assignments around the world. In May 2013 David was appointed as a Non-Executive Director of Pavilion Energy, a subsidiary of the Singapore investment firm Temasek Holdings. He has a degree in economics and geography from the University of Exeter.

Keun-Wook Paik, Senior Research Fellow, joined the OIES in January 2007. He is an acknowledged authority on Eurasian energy, in particular on Sino-Russian oil and gas cooperation, China’s natural gas industry, and DPRK’s offshore oil exploration. (His recent research interest is extended to Russia’s Arctic onshore gas development and LNG export, Iraq’s gas development, LNG export and the related infrastructure development, and east Africa’s offshore gas development and the related domestic infrastructure development.) He is also currently an associate fellow of the Chatham House Energy, Environment and Development Programme. He is the author of *Gas and Oil in North-East Asia: Policies, Projects and Prospects* (London: Royal Institute of International Affairs, 1995), and co-author/supervisor of *China Natural Gas Report* (China OGP, Xinhua News Agency, and RIIA, 1998). Dr Paik has contributed over 50 papers to a myriad of publications including: *Energy Policy*, *Journal of Energy and Development*, *Geopolitics of Energy*, *The Pacific Review*, *Oil & Gas Journal*, *Petroleum Economist*, *FT Asia Gas Report*, *China Daily Business Weekly*, *China Brief*, and *Asia–Pacific Review*. His book *Sino-Russian Oil and Gas Cooperation – The Reality and Implications* (OUP, 2012) has also been published in Chinese (in January 2013), Korean (in March 2014), and Japanese (in January 2016). In 2013, he was invited to become an adjunct professor by both Yonsei University (South Korea) and China Petroleum University (Beijing). In 2015, he was also invited to become a guest professor by Jilin University.

Luke Patey, Lead Senior Research Fellow of the Africa oil and gas programme, is also senior researcher at the Danish Institute for International Studies and fellow at the Rift Valley Institute. Patey is author of *The New*

Kings of Crude: China, India, and the Global Struggle for Oil in Sudan and South Sudan (Hurst, 2014), which was short-listed for the Africa-Asia Book Prize, and co-editor of *Sudan Looks East: China, India, and the Politics of Asian Alternatives* (James Currey, 2014) with Daniel Large.

Patey has written for the *Financial Times*, *Foreign Policy*, *Foreign Affairs*, *The Guardian*, *The Hindu*, and *VICE News*. His commentary has appeared in *Bloomberg*, *The Wall Street Journal*, *The New York Times*, the *Financial Times*, *Reuters*, *Al Jazeera*, *China Central Television (CCTV)*, the *BBC World Service*, and *Radio France*. He has also published scholarly articles in *African Affairs*, the *Journal of Modern African Studies*, *Journal of Contemporary China*, *Middle East Policy*, and *Third World Quarterly*. He has been a visiting scholar at the Centre d'études et de recherches internationales (Paris), Peking University (Beijing) and the Social Science Research Council (New York). He holds a BSc (Hons.) in commerce from Queen's University (Kingston) and a MSc and PhD from the Copenhagen Business School.

Donna Peng, Research Fellow, is currently pursuing a joint Master's degree in engineering and policy analysis, and electric power industry at Delft University of Technology and Comillas Pontifical University, respectively. She holds a MAsc in chemical engineering from University of Waterloo, where she conducted simulation-based feasibility studies of utility-scale energy storage projects, and a BEng in chemical engineering from McGill University. Her interests are focused on the interdisciplinary study of complex systems in the field of energy: from the design and operation of energy technologies, infrastructure, and markets, to the social arena that incubates and regulates them.

Beatrice Petrovich, Research Fellow, joined the OIES in November 2012 after conducting European gas hubs research with the Institute in August 2012. Her first paper on European gas hub price correlation was published in October 2013. In 2014 and 2015 she published two papers investigating the possible barriers to the creation of a single European gas market and the corresponding costs. Since 2016 she has been involved in a joint research project with the research institute EWI Cologne, aiming to assess the impact of changes in gas demand and supply patterns on the European gas network. Beatrice is researcher and PhD candidate at the Institute for the Economy and the Environment at the University of St Gallen (Switzerland), where she investigates the non-financial motivations behind investment decisions in the energy sector and the implications for policy. Before that, she worked for 5 years at REF-E, a leading energy consultancy based in Milan (Italy). Among other activities, she specialised in the analysis of the natural gas market and energy regulation, and contributed regularly to the editing and writing of REF-E specialised publications. She holds an MSc in economics from the University of Milan Bicocca and completed a one-year exchange at the University of Glasgow. While at university, she collaborated on a research project in the field of experimental economics.

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

Rahmatallah Poudineh, Lead Senior Research Fellow of the Electricity Programme, joined the institute in November 2014 to lead the electricity research programme. Previously he was a researcher at Durham University where he worked on energy research projects and finished his PhD in energy economics. Rahmat's educational background comprised an MSc in energy economics and policy from University of Surrey, a graduate diploma in economics from Queen Mary University of London and a BSc in aerospace engineering from Amirkabir University of Technology (Tehran Polytechnic).

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. Recent research published by the Institute includes analysis of the following issues, among others: experience meeting the challenges of electricity sector decarbonisation in the UK and Spain; problems facing the European electricity sector; a comparison of US and European electricity prices; the implications of the COP21 agreement for the natural gas industry; electricity demand response in Shanghai, China; the challenges of integrating renewable power in Europe; the prospects for coal and natural gas in the US electricity sector; and problems with regulation of wind power in Colombia. David runs his own consulting company (DR Associates), is an academic adviser to The Brattle Group of Economic and Financial Consultants, and was previously a director of NERA, where he was the co-chair of European Operations and of the Global Energy and Telecom Practices. He also worked at the International Energy Agency (IEA), and wrote his doctoral dissertation at the University of Oxford on the vertical disintegration of the international petroleum industry.

Howard Rogers, Chairman, Natural Gas Research Programme, joined the institute in January 2009 and succeeded Jonathan Stern as Director of the Natural Gas Programme in October 2011, he was appointed Chairman and Senior Research Fellow of the Programme in October 2016. Prior to joining the Institute, Howard was with BP for 29 years, mostly in business development, strategy, planning, mergers and acquisitions and negotiation roles in upstream oil and gas in European, North American, Middle East and FSU locations. In 1999, Howard joined BP's Gas and Power division and in 2003 he became Head of Global Gas Fundamental Analysis. He has a degree in Chemical Engineering and is a Fellow of the Institution of Chemical Engineers.

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

Anupama Sen joined the Institute in 2009. Her research interests lie in the applied economics of energy in developing countries, and her research has spanned the oil, gas, and electricity sectors, on which she has published extensively. In addition to OIES Papers, her work has appeared in academic journals and professional publications such as the *Energy Journal*, and *Gas Matters*, as well as in several book chapters and Op-Eds. Anupama is a Fellow of the Cambridge Commonwealth Society and has been a Visiting Fellow at Wolfson College, Cambridge. She is also a Region Head on the Asia Pacific Desk at Oxford Analytica. She holds a B.A. (Hons) from the University of Mumbai, M.Sc. from the London School of Economics and Ph.D. from Cambridge University where she was a Nehru Scholar.

Jonathan Stern, Distinguished Research Fellow of the Natural Gas Research Programme, founded the OIES Natural Gas Research Programme in 2003 and was its Director until October 2011 when he became its Chairman and a Senior Research Fellow, he became a Distinguished Fellow in October 2016. He is honorary professor at the Centre for Energy, Petroleum & Mineral Law & Policy, University of Dundee; visiting professor at the Centre for Environmental Policy, Imperial College London; fellow of the Energy Delta Institute and a Distinguished Research Fellow of the Institute of Energy Economics, Japan (in Tokyo). From 2011-16 he was the EU Speaker of the EU–Russia Gas Advisory Council. He is the author and editor of several books, including: *Natural Gas in Asia: The Challenges of Growth in China, India, Japan and Korea*, the second edition of which was published by OUP in 2008; co-editor with Bassam Fattouh of *Natural Gas Markets in the Middle East and North Africa* (OUP, 2011); and editor of *The Pricing of Internationally Traded Gas* (OUP, 2012). In 2014, his publications included papers (co-authored with other members of the gas programme) 'Reducing European Dependence on Russian Gas – Distinguishing Natural Gas Security from Geopolitics' and 'The Dynamics of a Liberalised European Gas Market: Determinants of Hub Prices and Roles and Risks of Major Players'. He is author of two chapters in: eds. Anne-Sophie Corbeau and David Ledesma, 'LNG Markets in Transition: the Great Reconfiguration', published by OIES and KAPSARC in 2016. His most recent paper on *The Future of Gas in Decarbonising European Energy Markets* was published by the Institute in January 2017.

Katja Yafimava, Senior Research Fellow, joined the OIES Natural Gas Research Programme in November 2006. She holds a D.Phil. in Geography and an M.Phil. in Russian and East European Studies from Oxford University. She was an expert at the EU-Russia Gas Advisory Council during 2012-2016. Prior to joining the Institute in 2006 she was an intern at Shell and at the Energy Charter Secretariat. She is the author of *The Transit Dimension*

of *EU Energy Security: Russian Gas Transit Across Ukraine, Belarus, and Moldova*, a book published by OUP in 2011. She is also the author and co-author of chapters in other books including *The Russian Gas Matrix: how markets are driving change* (OUP 2014), *Research Handbook on International Energy Law* (Edward Elgar 2014), *The Pricing of Internationally Traded Gas* (OUP 2012), *Russian and CIS Gas Markets and their Impact on Europe* (OUP 2009). She is also the author and co-author of several working papers on Russia-Ukraine, Russia-Belarus, and Russia-Moldova gas transit disputes, the latest in these series is a co-authored paper 'Russian Gas Transit across Ukraine Post-2019: pipeline scenarios, gas flow consequences, and regulatory constraints' (2016). She has published several working papers on EU and Russian gas regulation including 'The Evolution of Gas Pipeline Regulation in Russia – third party access, capacity allocation and transportation tariffs' (2015), 'The EU Third Package for Gas and the Gas Target Model: major contentious issues inside and outside the EU' (2013), and most recently 'The OPAL Exemption Decision: past, present, and future' (2017). She is currently working on a new paper 'Incremental and New Pipeline Capacity in Europe, and its implications for European Security of Supply'.

The following staff contributed to the work of the OIES in 2016. Their dedication and professionalism is essential to its continued smooth running.

- **Karen Clark** is responsible for the institute's accounts.
- **Jo Ilott** provides administrative support for the OIES Natural Gas Research Programme.
- **Susan Millar** manages the Oxford Energy Policy Club and Oxford Energy Seminar.
- **Scott McLachlan** is responsible for the institute's unique library.
- **Hannah Shipton** provides administrative support.
- **Kate Teasdale** is administrator and company secretary.

Visiting Research Fellows, Research Associates

Ali Aissaoui, Visiting Research Fellow, retired from a long career by returning to the Oxford Institute for Energy Studies as a visiting research fellow. He is also acting as an independent consultant, providing advisory in his field of experience and expertise. Ali has long been involved in extensive research on the political economy of petroleum with a particular interest in exploring how political, institutional, socio-economic and technological factors combine to shape energy policy. During his last years working for a regional multilateral development bank, he has broadened his research perspective and sharpened his focus on energy investment, investment climate, and financing across the Middle East and North Africa. In addition to informing policy decision-making, Ali regularly shares his research findings and puts them to use as a speaker, discussant and peer reviewer. Ali's involvement in relevant professional associations has provided him opportunities to interact with fellow experts and keep abreast of fast-changing global trends. In addition to the International Association for Energy Economics, Ali is a member of the Oxford Energy Policy Club, the Arab Energy Club, the Paris Energy Club, and the Algiers Energy Club.

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

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

Michael Bradshaw, Senior Visiting Research Fellow, joined the OIES in August 2008 and is also a professor at Warwick Business School, teaching in the global energy MBA programme. Before taking up this post in January 2014, he was professor of human geography at the University of Leicester. His PhD is from the University of British Columbia, Canada. His research is on resource geography, with a particular focus on the economic geography of Russia and global energy security. In 2007, he was awarded the Royal Geographical Society's Back Award for his applied research on economic change in post-socialist economies. Most recently, his research has focused on energy-related issues, including the development of the Sakhalin oil and gas projects in the Russian Far East and energy security in North-East Asia. From 2008 to 2011, he was engaged in a programme of research funded by a Leverhulme Trust Major Research Fellowship that examined the relationship between energy security, globalization, and climate change. This led – in October 2013 – to the publication of his book, entitled *Global Energy Dilemmas*. He also recently completed projects on the *UK's Global Gas Challenge* (2014) and *The Future Role of Gas in the UK* (2016), funded by the UK Energy Research Centre. He is co-editor of *Global Energy: Issues, Potentials, and Policy Implications*, published by OUP in 2015. He is currently writing a book on the geopolitical economy of Natural Gas for Polity Press. He is editor-in-chief of Wiley-Blackwell's *Geography Compass*, co-editor of *European Urban and Regional Studies*, and contributing editor of *Eurasian Geography and Economics*. In addition to his involvement with the OIES, he is an honorary senior research fellow at the Centre

for Russian, European and Eurasian Studies at the University of Birmingham and visiting professor of human geography at the University of Leicester.

Michael Xiaobao Chen, Visiting Research Fellow, is a leader at Statoil's Marketing and Trading division after having previously worked with Statoil's global upstream strategy and business development. Before joining Statoil, Michael worked as an energy economist in the Chief Economist Office of the International Energy Agency, leading Asian energy outlook, G20 global fossil fuel subsidy initiatives, and global oilfield decline rate analysis. His areas of expertise include: the Chinese gas & LNG markets; gas pricing; energy reforms and economic transition; strategy of NOCs; ASEAN energy markets; and upstream industry trends. Since joining the institute in 2011, he has contributed a chapter to *The Pricing of Internationally Traded Gas* (OUP, 2012) and published a paper entitled 'The Development of Chinese Gas Pricing – Drivers, Challenges and Implications for Demand' (July 2014). Michael holds an MSc in economics from University College London and an MSc in development from the London School of Economics.

Sylvie Cornot-Gandolphe, Research Associate, is an independent consultant on energy and raw materials, focusing on international issues. Since 2014, she has collaborated with the OIES as a Research Fellow. She also works with the Energy Centre of the French Institute of International Relations (IFRI) as a Research Associate, with *CyclOpe*, the reference publication on commodities, and with CEDIGAZ, the international centre of information on natural gas of the Institut Français du Pétrole (IFPEN). Sylvie has a long and proven experience in global gas and energy markets, gained during her past positions at IFPEN/CEDIGAZ, the UN/ECE, the IEA, and ATIC Services. She is the author of several reference publications on energy markets.

Trisha Curtis, Research Associate, is a Co-Founder of PetroNerds, LLC. She was formerly the Director of Research, Upstream and Midstream, at the Energy Policy Research Foundation, Inc. (EPRINC). Since 2010, she has led extensive research efforts and authored several reports on the North American upstream and midstream markets. In November 2015, Ms. Curtis published a study on the state of US shale oil in a low oil price environment with the OIES and EPRINC. She spearheaded EPRINC's projects with the US Department of Energy for the Quadrennial Energy Review, evaluating future North American crude oil production volumes and midstream transportation options through 2030. At PetroNerds, Ms. Curtis is currently evaluating U.S. upstream assets on a wells-up basis, assessing the viability of midstream and downstream projects, and studying global markets in order to assess the impact of lower oil prices on the US and other major oil producing nations. Ms. Curtis' work for the Department of Defense has focused extensively on China and international economics. Ms. Curtis is a non-resident fellow at EPRINC.

Hakim Darbouche, Research Associate, is Business Development Manager in the Upstream M&A group at OMV AG in Vienna. He took on this role in January 2017, after spending 4 years in London working for OMV's Upstream UK business in commercial, BD and asset management positions. Hakim worked at OIES from 2009 to 2012, during which time he led the Institute's research on MENA natural gas markets and North African energy issues. He holds a BA from Sussex University and a PhD from the University of Liverpool.

Ralf Dickel, Senior Visiting Research Fellow, has worked as an independent expert on international energy trade since leaving the Energy Charter Secretariat in October 2010. In October 2004, Ralf Dickel joined the Energy Charter Secretariat as Director for Transit and Trade, after heading the Energy Diversification Division at the International Energy Agency since 2001, being responsible for Policy Analysis of Energy Markets and of Energy Market Reform. Before joining the IEA, he worked as Senior Specialist for Oil and Gas Policy for the World Bank, after a long career with Ruhrgas from 1980 to 1998 where he held various management positions both in the gas purchase and the gas sales departments. He managed and co-authored several publications at the IEA and the Energy Charter, amongst them: *Security of Gas Supply in Open Markets* (IEA 2004), and *Putting a Price on Energy* (Energy Charter 2007).

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

and demand forecasts. He was secretary of the matching panel, which advised the British Gas board on supply/demand issues for company plans and negotiations with Ofgas, OFT, and the Monopolies Commission.

Chris Le Fevre, Senior Visiting Research Fellow, joined the OIES in September 2012. He has published working papers on gas storage in Great Britain (January 2013), the potential for natural gas as a transportation fuel in Europe (March 2014), and the impact of UK energy policy on the gas sector (September 2015). Chris has worked as an independent energy consultant since 2002, specialising in commercial, strategic, and regulatory issues in the natural gas sector, with particular focus on European and former Soviet markets. Chris has worked in the oil and gas industry for over 30 years. He has held a variety of positions to executive director level at Transco plc (now National Grid Gas plc) and British Gas. At Transco, he was the director responsible for implementing the 'Network Code' and the introduction of domestic competition. His roles at British Gas included establishing operations in a number of European countries, including Spain, the former German Democratic Republic (East Germany), Hungary, and the Czech Republic. Before British Gas, he worked for Shell in exploration and production companies in the Netherlands and Malaysia. He is also a contributor to Oxford Analytica and, until 2011, sat on the boards of the Northern Ireland Utility Regulator and the South Central Strategic Health Authority.

Andy Flower, Research Associate, has been working as an independent consultant since 2001. He specialises in the LNG business where his areas of expertise include: strategy marketing, project structures, shipping, pricing, supply and demand, and project economics. He retired from BP in 2001 after 32 years, including 22 years working in the company's LNG and natural gas businesses.

Florence Geny, Research Associate, has been working for 12 years in the oil & gas industry in Norway, the USA and the UK. Her career spans Commercial & Business Development roles, with an expertise in Oil & Gas M&A and Strategy. This includes establishing and executing corporate portfolio and growth strategies, originating, evaluating and structuring new investment opportunities, and leading cross-functional teams throughout the whole M&A transaction cycle. She has led numerous cross-border projects in North America, Latin America, Europe and Africa. Ms Geny joined Statoil in 2005, then Ophir Energy in 2014-2015, where she led New Business for Africa. Between 2008 and 2012, Ms Geny focussed on unconventionals. Following a secondment at the Institute in 2010, she published a widely-acknowledged research report on unconventional gas' prospects in Europe: Can Unconventional Gas be a Game-Changer for European Gas Markets?

Ms Geny graduated from Ecole des Hautes Etudes Commerciales (HEC) with a Master in Science of Management, and from Université Paris XI with a Master in Business Law.

Ieda Gomes, Senior Visiting Research Fellow, is the director of Energix Strategy Ltd, a consultancy specializing in energy strategy, natural gas and LNG supply, pricing, contracts, and market fundamentals. In a career spanning 30 years in the gas and energy industry, Ieda spent more than 13 years with BP, where she held senior positions, such as: vice president of new ventures for South Asia and Middle East, president of BP Brasil, and vice president of regulatory affairs for BP Gas and Power. Prior to BP, Ieda was the CEO of the S. Paulo Gas Company (Comgas), the largest gas distribution company in Brazil. Ieda is currently a councillor at the Brazilian Chamber of Commerce in Great Britain, a director at the Department of Infrastructure of the S. Paulo Federation of Industries, a member of the advisory board of Comgas, and sits on the board of directors of Bureau Veritas, Saint Gobain, Exterran Corporation and InterEnergy Holdings. Ieda is a senior adviser of the Brazilian think tank FGV Energia and is an active member of International Gas Union (IGU), having served on the executive committee and is currently vice-chair of the Task Force Strategic Communication and Outreach. She has presented at several energy conferences and training courses, most recently at the World Gas Conference, and she is a member of the programme committee of LNG 19. She is a regular columnist for the specialized magazine *Brasil Energia*. Ieda has a degree in chemical engineering from Universidade Federal da Bahia, an MSc in energy from Universidade de S.Paulo, and an MSc from Ecole Polytechnique Fédérale de Lausanne.

Elham Hassanzadeh, Visiting Research Fellow, joined the institute in 2012 as a research fellow and became a visiting fellow in 2014. Her research has focused on Middle East energy markets with a particular focus on Iranian oil and gas. She has several publications on the energy market reform and upstream oil and gas development, including a book on Iran's natural gas industry published by Oxford University Press. Elham is the founder and managing director of Energy Pioneers, an advisory firm focusing on Iran's energy sector investment and development. She is also a qualified barrister at the Iranian Central Bar Association, a visiting

fellow at the Global Subsidies Initiative (GSI) of the International Institute for Sustainable Development (IISD), and a political economy advisor to the World Bank on Middle East energy market reforms.

She holds an LLM in international commercial law from the University of Cambridge (where she was a Shell Centenary Scholar) and a PhD in oil and gas law and policy studies from the Centre for Energy, Petroleum and Mineral Law and Policy (CEPMLP), University of Dundee.

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

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

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

Chris Llewellyn Smith, Research Associate, is a theoretical physicist. He is currently Director of Energy Research, Oxford University President of the Council of SESAME (Synchrotron light for Experimental Science and Applications in the Middle East), and a Visiting Professor in the Oxford Physics Department.

He has served as Chairman of the council of ITER (2007–09) and of the Consultative Committee for Euratom on Fusion (2004–09), and was director of UKAEA Culham (2003–08), with responsibility for the UK's fusion programme and for operation of the Joint European Torus (JET). While at Culham, he developed and promoted the 'fast track' development of fusion energy. He was Provost and President of University College London (1999–2002), Director General of CERN (1994–8), and Chairman of the University of Oxford's Department of Physics (1987–92). During his time as CERN director, the Large Hadron Collider (LHC) was approved and construction started.

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

Richard Mallinson, Research Associate, leads analysis of geopolitics and global energy policy at Energy Aspects, where he is also a founding partner. He is a specialist on the MENA region, and follows developments in Libya, Iran and Iraq particularly closely. Richard focuses on how geopolitical events and trends impact on energy market fundamentals, particularly global oil markets. Prior to joining Energy Aspects, Richard spent more than six years working in central government functions in both the UK and Australasia. He has a deep understanding and track record of impact in all aspects of policy-making and analysis. He regularly provides media comment on geopolitical events and energy markets in publications such as the *Financial Times* and *Wall Street Journal* as well as appearing on CNBC, Bloomberg, the BBC, Sky News and others. Richard holds a BA in Politics and International Studies from the University of Warwick and is a member of the Royal Institute of International Affairs (Chatham House).

Michal Meidan, Research Associate, leads analysis of Asian energy policies and geopolitics, with a particular focus on China. Before joining Energy Aspects in January 2016, she headed China Matters, an independent research consultancy providing analysis on the politics of energy in China. Prior to that, Michal held senior analytical roles at Eurasia Group in New York and London, and at Asia Centre-Sciences Po, Paris. She has authored numerous academic articles and edited the book *Shaping China's Energy Security: The Inside Perspective*. Michal also regularly provides comments for a wide variety of media outlets and is featured as a speaker at industry conferences. Michal holds a PhD in Political Science and East Asian studies from Sciences Po, Paris. She is an associate fellow at Chatham House and at the OIES. She is fluent in Mandarin, Hebrew and French.

Robin Mills, Research Associate, Robin, was Non-Resident Fellow for Energy at the Brookings Doha Center, and is CEO of Qamar Energy (Dubai) He is an expert on Middle East energy strategy and economics. He is the author of two books, *The Myth of the Oil Crisis* and *Capturing Carbon*, columnist on energy and environmental issues at *The National*, and comments widely on energy issues in the media, including the *Financial Times*, *Foreign Policy*, *Atlantic*, *CNN*, *BBC*, *Bloomberg* and others. He worked for a decade for Shell, concentrating on new business development in the Middle East, followed by six years with Dubai Holding and the Emirates National Oil Company.

He holds a first-class degree in Geology from the University of Cambridge, and speaks five languages including Arabic and Farsi.

John Mitchell, Research Associate, is also an associate research fellow at Chatham House and honorary fellow at the Centre for Energy, Petroleum and Mineral Law and Policy at the University of Dundee. In November 2007, he received a lifetime achievement award for research from Saudi Arabia's King Abdullah at the opening of the 3rd OPEC Summit in Riyadh. He retired in 1993 from British Petroleum, where he held roles including: special adviser to the managing directors, co-ordinator for BP's subsidiaries in the western hemisphere, and head of BP's Policy Review Unit. In 1976–77, he was an academic visitor in the Department of Economics at the University of Cambridge. Mitchell is the author of numerous reports and briefing papers.

Tatiana Mitrova, Senior Visiting Research Fellow, is Head of Oil and Gas Department in the Energy Research Institute of the Russian Academy of Sciences (ERI RAS) and Fellow at the Center on Global Energy Policy. Dr. Mitrova has twenty years of experience in dealing with the development of Russian and global energy markets, including production, transportation, demand, energy policy, pricing and market restructuring. She is leading the annual "Global and Russian Energy Outlook Up To 2040" project. In 2011-2012, she was Head of Global Energy at the SKOLOKOVO Energy Centre responsible for analyses of global energy markets and the Russian Federation's energy export and import policy. In 2006-2011, she was Head of the Center for International Energy Markets Studies in ERI RAS. Dr. Mitrova is a member of the Governmental Commission of the Russian Federation on fuel and energy complex and member of the Board of Directors at E.ON-Russia JSC. Dr. Mitrova is a graduate of Moscow State University's Economics Department. She is an Assistant Professor at Gubkin Oil and Gas University and Visiting Professor at the Institut d'Etudes Politiques de Paris (Sciences Po) Paris School of International Affairs. She has more than 120 publications in scientific and business journals and four books.

Mari Luomi, Research Associate, is a Senior Research Fellow at the Emirates Diplomatic Academy (EDA), Abu Dhabi. Specialising in politics and political economy of natural resources and the environment, Dr. Luomi is an expert on international climate politics and climate and energy policy in the Gulf Cooperation Council nations. She holds a PhD in Middle Eastern Studies and has worked for research institutes in the fields of international affairs, regional studies and energy studies in Finland, Qatar and the United Kingdom.

Dr. Luomi previously was the Vice-President of the Finnish International Studies Association, Researcher at the Finnish Institute for International Affairs, Post-Doctoral Fellow at Georgetown University in Qatar, and Research Associate with the OIES to name a few. As part of a team of thematic experts, she has provided independent reporting on-site from intergovernmental negotiations on climate change, and has written hundreds of news stories on multilateral developments in the fields of climate change and sustainable energy policy globally.

Her research publications include a broad range of working and briefing papers, academic journal articles, essays, books and book chapters. She is also the co-editor of the recently-published volume 'The Green Economy in the Gulf' (Routledge 2015).

Jun Rentschler, Visiting Research Fellow, is a Doctoral Researcher at University College London, Institute for Sustainable Resources (School of Environment, Energy and Resources), and works as a consultant at the World Bank. Prior to starting his PhD, Jun was a Research Analyst at the World Bank's Chief Economist's Office for Sustainable Development, working on topics around climate change economics, green growth, risk, and resources. Before joining the World Bank, he worked as an Economic Adviser at the German Foreign Ministry, based at the German Embassy in Tokyo, where he focused on economic and energy policy. He has worked on energy, environment and development projects at the European Bank for Reconstruction and Development (EBRD), Grameen Microfinance Bank in Bangladesh, and the Partners for Financial Stability Program by USAID in Poland. Jun holds an MSc in Economics from University College London, with a specialisation in time series econometrics, and development economics.

Gulmira Rzayeva, Research Associate, joined the Oxford Institute for Energy Studies in 2013. She is a Senior Research Fellow at the Center for Strategic Studies (SAM) under the President of the Republic of Azerbaijan and a contributing analyst for the Jamestown Foundation's *Eurasia Daily Monitor*. Her areas of expertise include the energy policy of Azerbaijan, Black Sea and Caspian region energy security, and Turkey's domestic natural gas market. Ms Rzayeva has published numerous articles and commentaries on Azerbaijan's gas strategy and the 'Southern Gas Corridor' initiative, and has previously worked at the Moscow Carnegie Center, as a visiting research fellow, and at the Aleksanteri Institute of the University of Helsinki. She has a BA in international relations from Baku Slavic University and an MA in global affairs from the University of Buckingham, UK.

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

Amrita Sen, Research Associate, is the founding Partner and Chief Oil Analyst at Energy Aspects. Amrita leads Energy Aspects' analysis and forecasting of crude and products markets. Her specialism is in energy commodities, particularly oil and oil products. Amrita's deep understanding of the complex relationships within the global energy sector, her wealth of industry contacts and 10 years of experience, allow for a unique perspective on market outlook. She holds an MPhil in Economics from Cambridge University, a BSc in Economics from the University of Warwick, and is pursuing a PhD in Economics at the School of Oriental and African Studies, University of London. She is a Non-resident Senior Fellow at the Atlantic Council a Research Associate and was formerly Chief Oil Analyst for Barclays Capital. She is frequently featured in leading media outlets, including the Financial Times, BBC News, Reuters, Bloomberg, CNBC, Wall Street Journal, and Sky News, and at leading industry events as a speaker, and is regarded as a leading authority on oil markets.

Manal Shehabi, Visiting Research Fellow, is a PhD candidate in economics at the University of Western Australia and holds IPRS and APA scholarships from UWA and the Australian government. She holds an MIA-Economics from the School of Government and Public Services at Texas A&M University; a B.A. (Hons) *magna cum laude* from Ursinus College where she was a Queen Noor-Ursinus College Scholar; and diplomas from Harvard Business School Publishing and France's Université Marc Bloch. Her research focuses on economics of resource-rich countries, energy economics, applied macroeconomics, economy-wide modelling, and political economy of petrostates. Her current research project quantifies the impact of petroleum price volatility on the Kuwaiti economy, and evaluates economic and energy policies through economy-wide general equilibrium modelling. Her work also spans energy-labour linkages, sovereign wealth funds, and the under-researched

economic recovery of Kuwait post-Gulf War. Manal has expertise in energy and mining multinationals' transfer pricing, gained while working as an economist consulting for a Big Four professional services firm in the US and Australia and then as the in-house expert for a multinational oil and mining services company. Prior to that, she successfully launched and managed a business public policy project in Texas, and researched investments in the oil industry in West Asia at the UNCTAD.

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

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

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

Brian Songhurst, Research Associate, has an honours degree in chemical engineering from Imperial College London and is a fellow of the Institution of Chemical Engineers. He has 50 years of experience in the oil and gas industry, working for engineering contractors, operators, and specialist consultants. He is a past chairman of the Institution of Chemical Engineers Subject Oil & Natural Gas Group (SONG), which provides technical networking among its members to deliver best practices within the chemical engineering community. He has held senior positions in engineering, projects, and sales, and has led engineering and process design teams for gas processing, offshore oil & gas, refinery, and petrochemical facilities around the world. He recently retired and his last position was director of LNG for London-based consultancy ThyssenKrupp Uhde Energy and Power and managed a variety of LNG projects for both onshore and offshore (FLNG) applications. He was previously engineering manager with MW Kellogg, one of the world's leading LNG contractors, and facilities engineering manager with J Ray McDermott, one of the world's leading offshore contractors.

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

Philip Wright, Research Associate, is a fellow of the UK's Energy Institute and was formerly professor, then honorary professor, of energy policy and economics at the University of Sheffield. Over more than three decades, his research, publications, consultancy, and teaching have covered the gamut of energy industries and companies that operate in them. As well as contributing a critical perspective on the liberalisation of gas and electricity industries, his work has also addressed the fiscal regime of UK oil and gas. His views and expertise

have been sought by government organisations, international organisations, companies, trade unions, and universities in Europe and Latin America. Fluent in French and Spanish, he has been a visiting professor at the University of Montpellier 1 and at the University of Cartagena de Indias, Colombia. He is currently scientific director at the Observatorio del Caribe Colombiano in Cartagena de Indias, where he has been involved in various projects to improve the performance of the electricity supply in the nation's Caribbean region. These have included the development of a monitoring system to provide early warnings of problems which would delay the timely commissioning of new electricity network investment projects and, with his colleague Carmen Ocampo, an evaluation of the impact of a government electricity subsidy designed to assist the very poorest of households. Most recently, he and his colleague Lina Moyano have written a study of the extent to which Colombia's new system of distributing resource industry royalties has had a direct impact on poverty in its Caribbean region.

Accounts

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

For the Year Ended 31 December 2016

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

	Notes	Unrestricted funds £	Endowment funds £	Total 2016 £	Total 2015 £
Income from:					
Voluntary income	3	477,816	–	477,816	616,325
Incoming resources from charitable activities	4	555,031	–	555,031	688,984
Incoming resources from investments	5	206,093	–	206,093	185,632
Total income		<u>1,238,940</u>	<u>–</u>	<u>1,238,940</u>	<u>1,490,941</u>
Expenditure on:					
Raising funds	6	<u>37,697</u>	<u>–</u>	<u>37,697</u>	<u>36,859</u>
Charitable activities					
Projects and publications	7	843,294	–	843,294	891,895
Support costs	7	333,489	–	333,489	330,526
Total charitable expenditure		<u>1,176,783</u>	<u>–</u>	<u>1,176,783</u>	<u>1,222,421</u>
Other expenditure	11	28,283	–	28,283	27,750
Total resources expended		<u>1,242,763</u>	<u>–</u>	<u>1,242,763</u>	<u>1,287,030</u>
Net gains on investments	12	351,425	300,110	651,535	199,542
Net movement in funds		<u>347,602</u>	<u>300,110</u>	<u>647,712</u>	<u>403,453</u>
Fund balances at 1 January 2016		<u>3,106,138</u>	<u>3,637,254</u>	<u>6,743,392</u>	<u>6,339,939</u>
Fund balances at 31 December 2016		<u><u>3,453,740</u></u>	<u><u>3,937,364</u></u>	<u><u>7,391,104</u></u>	<u><u>6,743,392</u></u>

The statement of financial activities includes all gains and losses recognised in the year. All income and expenditure derive from continuing activities.

**OXFORD INSTITUTE FOR ENERGY STUDIES
(REGISTERED NUMBER: 01676971)**

Statement of Financial Position

At 31 December 2016

	Notes	2016 £	£	2015 £	£
FIXED ASSETS					
Tangible assets	13		15,398		12,266
Investments	14		6,832,549		6,012,935
			<u>6,847,947</u>		<u>6,025,201</u>
CURRENT ASSETS					
Debtors	16	30,084		162,254	
Cash at bank and in hand		629,267		668,478	
		<u>659,351</u>		<u>830,732</u>	
CREDITORS: Amounts falling due within one year					
Taxation and social security		23,453		–	
Other creditors		44,892		89,706	
Deferred income	18	47,849		22,835	
		<u>116,194</u>		<u>112,541</u>	
NET CURRENT ASSETS			<u>543,157</u>		<u>718,191</u>
TOTAL ASSETS LESS CURRENT LIABILITIES			<u>7,391,104</u>		<u>6,743,392</u>
Capital funds					
Endowment funds – general			3,937,364		3,637,254
Income funds					
Unrestricted funds			<u>3,453,740</u>		<u>3,106,138</u>
TOTAL FUNDS			<u>7,391,104</u>		<u>6,743,392</u>

These financial statements have been prepared in accordance with the special provisions of Part 15 of the Companies Act 2006 relating to small charitable companies.

**OXFORD INSTITUTE FOR ENERGY STUDIES
(REGISTERED NUMBER: 01676971)**

Statement of Cash Flows

At 31 December 2016

	Notes	2016 £	£	2015 £	£
Cash flows from operating activities					
Cash (absorbed by)/generated from operations	23		(63,764)		165,195
Investing Activities					
Purchase of tangible fixed assets		(13,461)		(13,323)	
Purchase of investments		(807,411)		(608,388)	
Proceeds on disposal of investments		639,332		748,414	
Interest received		206,093		185,632	
Net cash generated from investing activities			24,553		312,335
Net cash used in financing activities			—		—
Net (decrease)/increase in cash and cash equivalents			(39,211)		477,530
Cash and cash equivalents at beginning of year			668,478		190,948
Cash and cash equivalents at end of year			629,267		668,478

**Independent Auditor's Statement to the Members of
Oxford Institute for Energy Studies**

We have examined the summary financial statement for the year ended 31 December 2016.

Respective responsibilities of Trustees and auditor

As explained more fully in the statement of Trustees responsibilities set out in the full annual financial statement, the Trustees, who are also the directors of Oxford Institute for Energy Studies for the purposes of company law are responsible for the preparation of the accounts and for being satisfied that they give a true and fair view.

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In our opinion, the summary financial statements are consistent with the full annual financial statements of Oxford Institute for Energy Studies for the year ended 31 December 2016 and complies with the applicable requirements of section 427 of the Companies Act 2006, and the regulations made thereunder.

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