



A QUARTERLY JOURNAL FOR DEBATING ENERGY ISSUES AND POLICIES

This edition of the *Forum* is dedicated to developments in Chinese energy.

One of the top concerns for commodities markets is the health of the Chinese economy. In his article, Damien Tobin examines some of the implications of moves to rebalance the economy away from high savings and fixed investment towards private consumption. He argues that while the Chinese leadership can point to many successes, which include managing economic growth in a highly uncertain environment, the rebalancing has had some unintended consequences in terms of urban labour shortages and rising costs. Furthermore, the author argues that one of the biggest threats to rebalancing is the legacy of the fiscal stimulus, which has resulted in the accumulation of significant local government debt. The article notes that while risks exist, the Chinese Government still has ample scope to maintain growth, though the margin for policy errors has decreased.

In their article, Bassam Fattouh and Amrita Sen examine some of the implications of China's rebalancing on oil consumption patterns. They find that in the last few years the growth in gasoline and jet fuel consumption – fuels more geared toward consumers – has been robust, unlike that of diesel, which has witnessed a slowdown in growth as

the Chinese economy continues to shift away from investment-led growth. The authors argue that this trend is expected to persist as the number of vehicles continues to grow at a robust pace, and the appetite for luxury cars is on the rise. These changing demand dynamics will have a big impact on global petroleum products trade flows where China has already turned into a net exporter of diesel.

In his article, Trevor Sikorski points to the fact that, unlike its position in relation to other commodities, China has not been central to the global natural gas story over the last 10 years. However, this is about to change as the country aims to increase the role of gas in its energy mix, to meet demand for urban heating as China takes steps to replace coal-burning boilers with cleaner gas-burning systems to deal with the pollution crisis. With the rapid increase in demand, China has become more reliant on gas imports, including LNG. However, given the various potential sources of gas supply both domestically and from abroad, there is a wide uncertainty regarding future Chinese LNG demand. As the article concludes, by 2020, there will be significant liquefaction capacity in China and in principle the country could constitute an important market for LNG, but the uncertainty is very substantial.

CONTENTS

China Energy Developments:

Slowing growth and economic rebalancing in China Damian Tobin	4
China's rebalancing and oil consumption patterns Bassam Fattouh and Amrita Sen	6
China: the upcoming global gas giant Trevor Sikorski	8
Shale gas development and challenges in China Liu Xiaoli	10
The implications of global natural gas market developments for China Tatiana Mitrova	13
Impacts of the US shale gas revolution on China's national energy security Yingxia Yang and Hengwei Liu	16
Sino-Russian energy cooperation Keun-Wook Paik	19
Addressing climate change: China's status and policies Li Junfeng, Yang Xiu, and Zhang Minsi	22
Power system development and CO ₂ emission reduction in China Li Ji	26
EU-China solar dispute reveals flaws in global trade system Renfeng Zhao	28
China starts trading carbon Christian Ellermann and Constanze Böning	31
Decoding the changes of China's foreign energy policy Xu Qinhu	34
What does America's energy revolution mean for China? Gal Luft	36
Letter of reply	39

In her article, Liu Xiaoli addresses one important source of uncertainty: the prospects of shale gas development in China. The author notes that the development of shale gas resources has become central for Chinese government energy policies, especially given the large scale of the resource base. The article outlines some of the major initiatives adopted by the government to encourage shale gas development. However, some key challenges – including technological, logistical, regulatory, and environmental – remain. Despite these challenges, the author expects shale gas to make an important contribution to China's energy mix in the next two decades.

Tatiana Mitrova examines the ongoing transformations in the global gas markets and the opportunities these changes present for China. The author identifies the following major trends: the approaching LNG glut; increased competition and shrinkage of uncontracted niches in Asia; and the challenge to oil-linked pricing as market-based gas pricing becomes more widespread. Despite China's dependency on gas imports, the author argues that China could be a winner in this gas 'Great Game' as a result of these transformations.

Yingxia Yang and Hengwei Liu explore the challenge of balancing China's environmental protection with its energy security. China's State Council recently announced the *Atmospheric Pollution Prevention Action Plan*. One important measure involved the use of natural gas to replace coal. However, this implies increased reliance on natural gas imports, raising concerns about energy security. The authors argue that the US shale gas revolution and US LNG exports have the potential to improve China's energy security in three ways: geographic diversification of energy supply sources, a reduction in international prices for natural gas,

and reduced oil-related price volatility for imported natural gas.

Keun-Wook Paik analyses the latest developments in Sino-Russian energy cooperation. A recent agreement to increase Russian oil exports reflects a sharp decline in China's domestic production and China's need for alternative, secure supplies. There has, however, been little progress in relation to Russian natural gas exports; this is largely due to disagreements on price, and to China's unwillingness to accept Russia's strategy of sharing natural gas supply sources with Europe. Meanwhile, China has found alternative supplies. Russia has announced important changes that could lead to an increase in their natural gas exports, but great uncertainty remains.

Li Junfeng, Yang Xiu, and Zhang Minsi analyse the debate concerning the need to balance economic growth with environmental protection and carbon emission control. Policies increasingly support sustainable economic development and environmental protection, and there is growing support for the view that China should establish a greenhouse gas emissions peak. However, critics of such a view argue that no other countries have taken measures to achieve an emissions peak before completing the process of industrialization and urbanization, and that setting a peak will negatively affect China's economic development.

Li Ji explores the relationship between electricity and China's CO₂ emissions. High coal intensity and rapid demand growth for power explain why China became the world's largest emitter of CO₂ in 2008, although its emissions are less than they would have been in the absence of a variety of policies aimed at limiting carbon intensity. These policies include closure of inefficient coal-fired power stations, promotion of non-fossil fired generation (nuclear,

hydro, and renewables), and pressure on state-owned enterprises to reduce demand. CO₂ emissions from power will continue to grow, but efforts to curb this growth will intensify further.

Renfeng Zhao analyses last year's EU–China trade dispute over solar PV products and its consequences. He argues that it revealed the lack of trust between the two sides in combating the global threat of climate change, as well as intrinsic flaws in the international trade system. The introduction of a price floor for Chinese imports into the EU has raised prices and reduced demand for solar PV, while damaging many solar companies in China and the EU. The dispute casts a shadow over Sino-European relations and undermines efforts to reach consensus on tackling the global issues of energy security and climate change.

Christian Ellermann and Constanze Böning explain the nature of the new pilot greenhouse gas emission trading schemes (ETS) in China, as well as the significance of their introduction. By moving towards the allocation of emission rights through market mechanisms, the government is signalling that it is addressing climate change seriously and that it wishes to be compared to Europe and the most progressive regions of North America that have also adopted emissions trading. However, the authors also argue that a transition to a more important role for markets in the area of energy and the environment is still in its very early stages.

Xu Qinhua offers four clues to the process of understanding China's international policy with respect to energy. The first is that China is increasingly taking a market-driven approach to domestic and international energy, involving a greater role for private and mixed companies. The second is the opening up of the midstream and downstream oil



and gas sectors in China to foreign investment and technology. The third is the country's increased reliance on multilateral cooperation. Finally, China is putting increased emphasis on a low-carbon energy mix in China and abroad.

In his article, Gal Luft examines some of the implications of America's energy revolution for China. The author dismisses the myth that US military and diplomatic involvement in the Middle East is tied to

US dependence on imported oil from the region. After all, the USA only imports a small share of its oil from the region. However, stability in the Middle East is key for oil price stability, which remains a major concern for US policymakers. Hence the concerns of some Chinese officials – that US energy self-sufficiency will reduce the interest in the Gulf and increase the risk of disruption from the region – are misplaced. Luft

argues that China should embrace the US shale revolution, as the revolution has enlarged the world's energy pie and offered China more opportunities to have access to this bigger pie.

All views expressed are solely those of the authors. They do not necessarily represent the views of the Oxford Institute for Energy Studies, any of its Members, or any other organization or company.



CONTRIBUTORS TO THIS ISSUE

Constanze Böning is at GIZ, Beijing, China

Christian Ellermann is Senior Consultant, International Climate Policies at Ecofys, Cologne, Germany

Bassam Fattouh is Director, Oxford Institute for Energy Studies

Li Ji is Associate Research Professor, Center for Energy Economics and Development Strategy, Energy Research Institute of National Development and Reform Commission

Li Junfeng is at China's National Center for Climate Change Strategy and International Cooperation

Hengwei Liu is non-resident Professor at the School of Management at Harbin Institute of Technology, China

Liu Xiaoli is Professor and Deputy Director of the Center for Energy

Economics and Development Strategy, Energy Research Institute of National Development and Reform Commission

Gal Luft is Co-Director of the Institute for the Analysis of Global Security and senior adviser to the United States Energy Security Council. He is co-author of *Petropoly: The Collapse of America's Energy Security Paradigm* (2012)

Tatiana Mitrova is Head of Oil and Gas Department, Energy Research Institute, Russian Academy of Sciences

Keun-Wook Paik is Senior Research Fellow, Oxford Institute for Energy Studies

David Robinson is Senior Research Fellow, Oxford Institute for Energy Studies

Amrita Sen is Chief Oil Analyst, Energy Aspects

Trevor Sikorski is Head of Natural Gas, Coal and Carbon, Energy Aspects

Damian Tobin is Academic Director International Management (China), CeFiMS, SOAS

Xu Qinhua is Director, Center for International Energy and Environment Strategy Studies, Senior Researcher, Academy of National Development and Strategy, Renmin University of China

Yang Xiu is at China's National Center for Climate Change Strategy and International Cooperation

Yingxia Yang is an Associate at the Brattle Group

Zhang Minsi is at China's National Center for Climate Change Strategy and International Cooperation

Renfeng Zhao is Research Fellow, Oxford Institute for Energy Studies