

Step by Step: The Reform of China's Energy Economy

About KAPSARC

The King Abdullah Petroleum Studies and Research Center (KAPSARC) is a non-profit global institution dedicated to independent research into energy economics, policy, technology, and the environment across all types of energy. KAPSARC's mandate is to advance the understanding of energy challenges and opportunities facing the world today and tomorrow, through unbiased, independent, and high-caliber research for the benefit of society. KAPSARC is located in Riyadh, Saudi Arabia.

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Key Points

Reform has dominated political discussion in China at least since Xi Jinping took over the leadership at the end of 2012. There is increasing understanding both inside and outside China that the economy is rebalancing from export – led growth toward domestic consumption. This emerging ‘new China’ is making reform – including reform of the energy economy – ever more necessary and urgent.

China’s successes have elevated it to a middle-income country, but with this have come new challenges and new targets, not least of which surround the dependence upon coal and the regulation of its energy sector. The ambition of doubling per capita GDP once again will require an updated economic growth model and an optimized energy fuel-mix. It also implies the emergence of a more affluent society with new expectations to be met, and the development of a more predictable regulatory system.

Neither the need for reform nor its urgency is open to doubt, only the route to be followed. Incrementalism in reforming the energy economy emerges as key if China’s leaders are to confound the skeptics once again.

Summary for Policymakers

China has become a regional powerhouse, a middle-income country and home to the world's largest middle class. Its GDP has grown from \$400 billion in 1971 to more than \$13 trillion in 2012 (purchasing power parity, 2005 US\$). The government aims to double GDP per capita once again, from its 2010 level, by 2020.

Incidents of smog in Beijing have captured political attention and moved environmental considerations up the priority list. Middle-class aspirations are driving discussions of improved services. The economic slowdown and financial turmoil have revealed the limits of state power and added to the determination to re-focus the economy, update the country's fuel-mix and prioritize demand-side management. In the previous workshop this was viewed through the lens of sustainable development and the desire to create what we referred to as the 'Golden Economy'.

These ambitions of state have led to more than 60 developmental goals being announced from 2013's Third Plenum alone. Taken together, it can be imagined that China is attempting to formulate a 'planned free market'. The need to move to wider private participation, further deregulate and liberalize key sectors (including energy) and improve overall economic efficiency have all entered mainstream political discussion. China's economy, colossal both in size and complexity, can no longer be purely centrally managed. This can equally be said of the country's energy economy more specifically.

Despite the recognized urgency for reform, incrementalism – a gradualist, step-by-step approach – has emerged as the chosen way to manage, understand and mitigate the unintended consequences that may flow from policy reform. Economic efficiency cannot be at the expense of social harmony. The narratives that drive incrementalism are that:

- Privatization can lead to unemployment.

- Sector deregulation can lead to the entry of small-scale operators with lower safety and environmental standards.

- Price liberalization can lead to increasing fuel costs, which in the case of natural gas might render it even less competitive versus coal.

- The ending of monopolies can slow required infrastructure expansion.

Improved regulatory capacity and oversight may be the first step toward the wider reform of China's energy economy. The weaknesses of China's energy bureaucracy have been discussed since at least 1993, when the Ministry of Energy was abolished.

The challenges China's energy regulators face stem not only from the interconnected complexities of energy, economic, social and environmental policies, but also from the realization that the energy sector is more than just a provider of fuel: it is part of society and, as such, a pillar of China's drive for social modernization.

In much the same way as the 'Golden Economy', which we referred to in the previous workshop, required a coordinated response, so the actual implementation of energy-reform policies requires a coordinated response across the breadth of government. A clearly articulated top-down set of goals to achieve renewed economic efficiency, managed and implemented by a reinvigorated and reinforced energy bureaucracy, can help deliver the demanded economic and social modernization, but may best be pursued through a series of closely watched incremental steps. China's policy activism may have taken its cue from international experiences, but its implementation will likely succeed best when grounded in the Chinese experience. In this we may see a continuation of the Chinese developmental model: reform with Chinese characteristics.

Background to the Workshop



KAPSARC's Energy Workshop Series on China's Energy Policies creates a continuing, open and collaborative space for the discussion of some of the most pressing questions facing the development of China's energy economy. Each workshop is presented as a self-contained discussion, but one that leverages the policy and economic knowledge platforms arising from the dialogue KAPSARC is facilitating. In this way, they become a forum for cross-discipline interaction that advances the research agenda while also leading to policy relevant insights.

In November 2015, KAPSARC hosted the fourth in this series to explore the Reform of China's Energy Economy. The workshop, held in Riyadh, built on the previous workshop held in Hong Kong in April, 2015.

In that earlier workshop, the limits to the sustainability of China's current energy economy were discussed, together with China's ambition to build a 'Golden Economy' — a future in which energy, water and land use are harmonized with social and economic needs, incorporating meaningful employment in areas with good housing and services.

Such transitions require a concerted policy program and a nuanced understanding of transitions, of trade-offs and of unintended consequences. This was the subject of the latest workshop, which resulted in an improved understanding of China's faith in incremental market reforms to improve its economic and energy efficiency.

Introduction

China is preparing for a renewed period of reform. The astonishing levels of change and development over the last 60, and especially the last 30, years have for some created a bewildering new country. This is true both for those living in China and for those looking in from outside. For both groups, there is uncertainty as to where China is now and where it is headed; a consensus is that there is still plenty to be done. Certainly the challenges that the country currently faces are enormous and this is equally true of the energy sector in particular. There is a growing feeling that the Hu-Wen decade was a missed opportunity. Beyond that, internal and external opinions diverge, as the views of those looking in from the outside, while interesting, often do not coincide with those from the inside.

Today's Chinese leaders face a whole set of policy quandaries:

Perhaps 100 million Chinese still need to be lifted up from below the poverty line but, in the face of escalating wealth inequality, the emergent middle class (approximately 750 million) are increasingly demanding policies that reflect their needs and aspirations.

Continued urbanization will improve standards of living for millions and help boost productivity, but will also exacerbate energy demand and concentrate the population in areas of high air pollution and water scarcity, raising the profile of China's environmental difficulties.

China's economic future will not mirror its past. The country is unlikely to return to double digit growth. Inflation levels that have been close to or below zero for much of the last three-and-a-half years suggest that even the new normal of 6-7 percent is a stretch.

Small, simple economies are easier to plan and manage than large, complex ones. China's policymakers have become victims of their own success. As disparate parts of the government work to improve the economy's efficiency, its new complexity raises the frequency and severity with which unexpected linkages can derail the policymaker's best intentions. Change always brings risk. Disruptions can have costs. Ad hoc solutions can lead to new problems. Economic and social optimization is an enormous challenge, one that can lead to almost constant course corrections. Without a clear top-down plan, policymakers run the risk of being buffeted between apparently competing demands as corrective action in one area creates imbalances in another.

A key question facing China, then, is what is the objective of its reform?

Enhancing Economic Efficiency

Understanding what the administration's overarching goals are is key to understanding the likely path of reform in China's energy economy. Yet the knee-jerk response of some Western commentators, political control and social stability, is increasingly simplistic. The essential question is: How can social stability best be maintained in the short, medium and long term?

- Enhanced supplies of energy and goods?
- Low priced goods for consumers?
- Environmental conservation and protection?

Prioritizing any one of these could conceivably help ensure social stability. Secure energy supplies keep the lights on; low-cost goods keep inflation down and consumers happy; environmental remediation will tackle a critical political priority. But pursuing any one without regard for the others could skew incentives and undermine the broader political and developmental agenda. Focusing only on secure and abundant energy would likely lead to increased coal consumption, worsening some environmental problems. Concentrating solely on keeping costs low could lead to unsustainable subsidies that would only need to be unwound later at greater social cost. Concentrating only on environmental protection could increase costs, weaken consumption and cost jobs.

The real objective is enhanced economic efficiency and sensitivity to real world economic conditions. This would lead to an energy economy that is:

- Commercially competitive and does not rely on subsidies.
- Free from administrative monopolies.
- Under clear, strong regulation.

Such objectives can be seen in the treatment of the energy sector, and especially the oil and gas sector, since the reform period began. Under Deng Xiaoping there was an emphasis on the professionalization of the sector as the 'big three' companies — CNPC, Sinopec and CNOOC — were spun out of the old ministry. Under Jiang Zemin the emphasis shifted to ensuring adequate supplies of energy as the country became a net oil importer for the first time. More recently, under Hu Jintao, and continuing to the present time, the focus has switched to demand-side management, as runaway energy demand was linked to major inefficiencies and environmental degradation.

Yet while the energy industry has seen progressive modernization, China's energy regulation has lagged behind, and this has hindered the realization of further economic efficiency. The abolition of the Ministry of Energy in 1993 left a vacuum that has since been filled with bureaucratic wrangling. Attempts to set up replacement regulatory offices foundered in the face of bureaucratic opposition from both the state-owned energy companies and the National Development and Reform Commission (NDRC). As an example of the skew within the industry, at the end of 2005, the regulatory Energy Bureau had just 57 staff; combined, CNPC and Sinopec had over 800,000 employees. Succeeding announcements in 2008, establishing the National Energy Commission and National Energy Bureau, and in 2010, setting up the National Energy Council, did little to strengthen real oversight of an industry that had acquired a reputation for corruption.

As a consequence, CNPC has found itself the focus of an anti-corruption campaign and in 2014 President Xi called for an energy revolution with an emphasis on demand-side management: consumption growth was to be reduced and efficiency improved. Suddenly, energy in China appeared very 'political'.

Yet, in the background, domestic energy policy in China has not been about politics. It has been driven by new priorities, both internal and international and China's policymakers have achieved real and significant progress. The old imperatives of assured and reliable supply have largely been met and superseded: the country has realized that energy security is not synonymous with energy independence and the bureaucracy has delivered the former even if the latter is currently impossible. China's political economy has enabled equal success on the demand side: since 1980, China's energy productivity — the GDP produced for every unit of energy used — has increased

threefold. The post-WTO accession period of 2003-2011 had an average annual energy growth rate of 8.1 percent. The average for 2012-2014 was just 3.7 percent. The growth rate for 2015 is likely to have fallen to just 1 percent. The continued adoption of energy saving technologies, a slowing in the growth of car sales, and a structural shift from heavy industry towards light industry and services should all see energy demand growth continue at these new lower rates. Something like a 'planned free market' has emerged.

Much still needs to be done and the effects of reforming China's energy policy will be felt across both the wider economy and society in general.

Social Modernization

The energy sector is about more than just fuels and power. It is a central pillar of social modernization.

China's development over the last 30 years has been so successful that many have come to take it for granted (see Figure 1). Domestically, a generation has grown up to know only rapidly rising personal fortunes. Externally, cohorts of short-term analysts have built a career on China's rise being a one-way bet.

As discussed in previous KAPSARC workshops, earlier dizzying development was based on a traditional model of heavy industry and exports. The result was an explosion in energy demand along the coast. Almost 50 percent of the world's coal demand emanates from this tiny slither of land, perhaps only around 2 percent of the world's landmass. Such highly concentrated use of energy has led to serious concerns over pollution — especially air, but also water and land — energy security and the sustainability of development.

A new model of development has been called for, which in our previous workshop we called the 'Golden Economy'. This new developmental paradigm represents a fundamentally different approach: an upgrade in both industrial processes and technology, but also a modernization of the fabric of society. A revised policy framework is needed not only for President Xi's 'energy revolution', but also for renewed coordination of economic, social and environmental policies.

Demand-side management has moved center-stage and policymakers must grapple with the counterintuitive goals of making it more profitable to save energy than to use it and of driving growth by controlling consumption. But such attempts raise perplexing questions:

How can avoiding consumption boost profits and how can the economy retrench without entering recession? What policy environment is required to develop successful business models

based on saving energy, and how can the savings be measured?

China's energy mix has evolved just as in wealthier societies, but it has done so through addition, not substitution. The amount of biomass used in primary energy has actually increased since 1970, suggesting that there is still a rump of the energy sector demanding modernization and of society crying out for increased consumption opportunities. How can this unmet demand best be met?

China's economic slowdown is not being experienced equally in all areas, with inland, industrial and energy-producing provinces — which already lag behind the developed coastal cities by perhaps 15 years — being hardest hit. Can reinvigorating inland urbanization and development through liberalization, while at the same time continuing the rationalization of inefficient small-scale industrial enterprises, offset dampened growth elsewhere?

How can China's bureaucratic capacity be both politically and legally strengthened to provide not only a more predictable regulatory environment for the current energy sector, but also a regulatory environment that is flexible enough to build tomorrow's?

An intrinsic part of social modernization, increasing affluence and rising expectations, is a changing relationship between the citizen and the state. Elsewhere this has taken the form of increased government responsiveness and the expanded provision of social welfare services. Both trends can be seen in China, but both are likely to incur costs, which in turn may affect the sustainability of government revenues and the tax base. The proportion of government revenue coming from personal income tax is currently low. As China's economy continues to reform, the government's fiscal base may also need renewal, driving wider social changes.

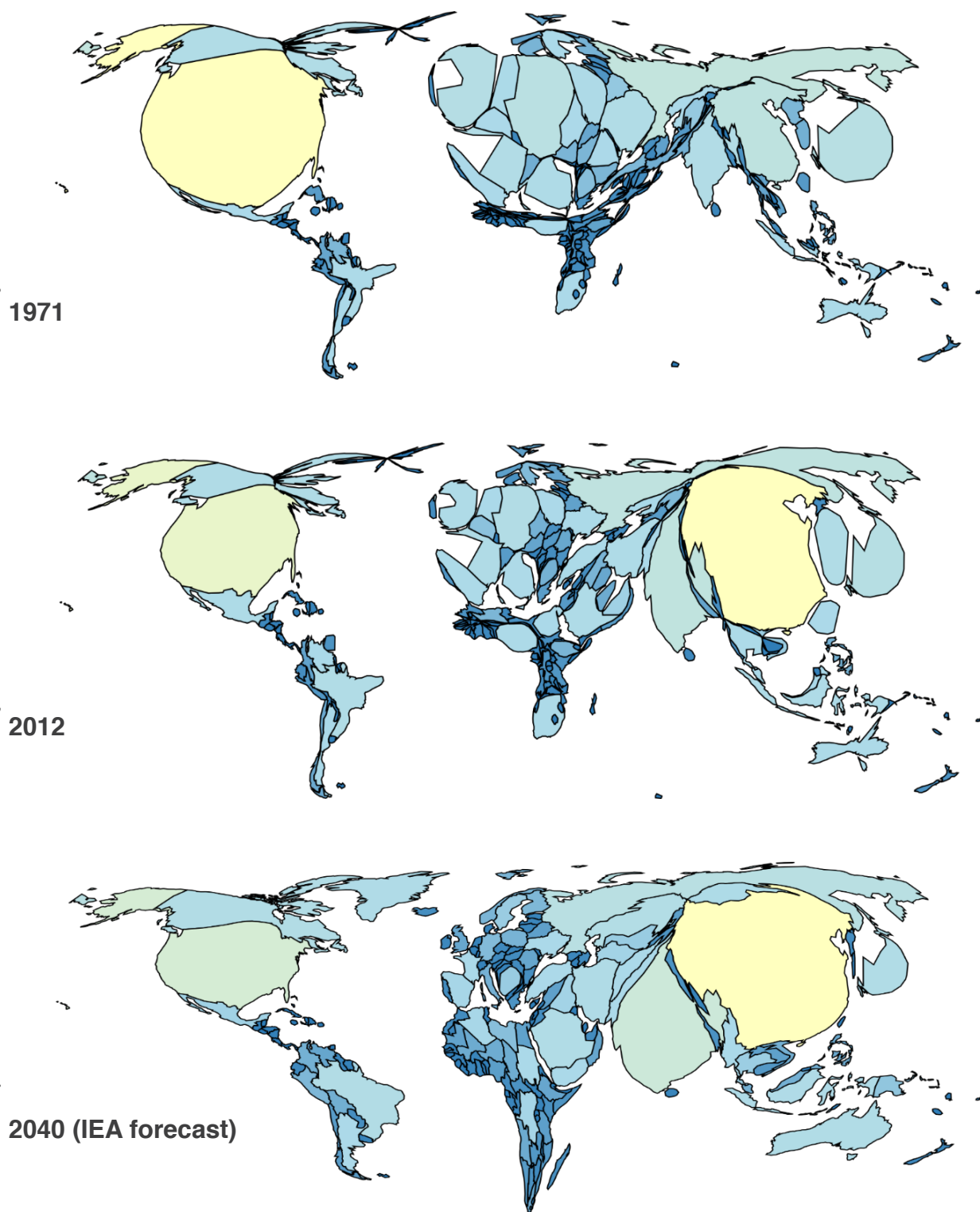


Figure 1. An energy map of the world.

Countries are scaled according to their share of global energy. China's journey from 1971 (top), through 2012 (middle), to 2040 (bottom) shows it becoming by far the largest energy consumer, a journey that is reflected also in its GDP growth from \$0.4 trillion in 1971 to \$13 trillion in 2012 and an estimated \$50 trillion by 2040. (All figures in 2005 U.S. dollars, purchasing power parity.)

Source: Duke Energy Initiative; IEA World Statistics.

Incrementalism

Since 2013, China's government has entered an era of 'policy activism', announcing over 60 reform goals in the Third Plenum alone. The 13th Five Year Plan, effective from 2016, is expected to carry much of the reformist agenda forward. In short, the government intends to shift the country's economic model away from export and capital investment and toward domestic consumption and an enlarged service sector. But despite the urgency there are risks in moving too fast.

Privatization is an obvious route to economic efficiency, but the cost of increased unemployment may be too high at a time when the overall economy is slowing and job creation falling.

Deregulating the mining industry could boost production, but the proliferation of small-scale mines in the past has been blamed for the Chinese coal industry's unacceptably high accident rate.

Stripping companies of monopolies may foster competition and drive down prices, but it could also impede the development and expansion of much needed infrastructure, such as China's domestic gas transmission and distribution pipeline network.

Completing the gas price reforms will improve company returns and free up cash flows for investment, but could drive inflation and slow the uptake of an already expensive fuel, preventing its environmental benefits from being realized.

With every proposed solution come new challenges, requiring their own policy fixes. Theoreticians who call for rapid, far-reaching upheavals are likely to be concentrating on the destination rather than

the journey. Bumpy journeys can undermine social harmony. A slower, evolutionary approach is perhaps more practical. The government's preferred solution to these risks appears to be an expansion of its 'planned free market'. Top-down policy frameworks can mandate minimum technology and efficiency levels and manage the reform process in accordance with Deng Xiaoping's over-quoted "crossing the river by feeling the stones" formula.

Before sectors are privatized, a revised and reinvigorated regulatory framework could be put in place.

Before sectors are deregulated, minimum standards could ensure the closure of inefficient, outdated, or unsafe facilities.

Before monopolies are ended, current infrastructure could be first given independent management, then placed in the hands of independent operators within the state system then, eventually, allowed to come under independent ownership.

Before price reforms are completed, targeted support for vulnerable consumers and environmental incentives could be considered to ensure the most vulnerable in society and the environment are protected.

Once again, strengthening and expanding the state's regulatory apparatus appears to be key. Improved economic efficiency, continued social mobilization and the proper implementation of incremental reforms all rely upon a robust, predictable and legally enforceable regulatory environment that not only encourages active investment by new players, but also limits the corporate excesses of privileged incumbents.

Finding China's Road Map to the Future

What will China and its energy economy look like in 10, 20 or 50 years? The jury is still out.

The government has drawn up a manifesto for transformational change: change that will encompass both the country's economy and its society and that could reshape the energy sector. A manifesto that envisages an expanded role for the economy, but still maintains a proactive state that steps in to plug the gaps where the energy markets are perceived to be failing. A manifesto that delivers for its burgeoning middle classes, but still

raises the standard of living for the poorest in the society. A manifesto that learns from international experiences, but still cleaves to a distinctly Chinese model of development. In short, a manifesto that could deliver an optimized fuel-mix for an improved environmental footprint, more transparent energy pricing to enhance demand-side management, but with targeted help for the most vulnerable in society.

The Chinese leadership has surprised the cynics and skeptics in previous phases of the economy's transition and, through patient incrementalism, hopes to do the same again.

About the Workshop

KAPSARC convened a workshop in November 2015 with some 30 international experts to facilitate a discussion on reforming China's energy economy. The workshop was held under the rule of summarizing the discussion on a non-attribution basis. Participants comprised:

Samer AlAshgar – President, KAPSARC

Philip Andrews-Speed – Principal Fellow & Head, Energy Security Division, Energy Studies Institute, National University of Singapore

Kerry Brown – Director, Lau China Institute, King's College London

Jean-Pierre Cabestan – Professor of Political Science, Head of Department, Hong Kong Baptist University

William Chandler – President, Transition Energy

Du Wei 杜伟 – Senior Economist, CNPC ETRI

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Fan Ying 范英 – Director, Centre for Energy and Environmental Policy Research, Institute of Policy and Management, CAS

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Huang Haifeng 黄海峰 – Assistant Dean, HSBC Business School, Beijing University

David Hobbs – Head of Research, KAPSARC

Jheng Ruei-He 鄭睿合 – Researcher, Chung-Hua Institution for Economic Research

Raja Khan – Senior Economist, Jadwa Investment

Leo Lester – Research Fellow, KAPSARC

Li Xihong 李希宏 – Chief Representative, Sinopec Saudi Arabia

Liang Chi-Yuan 梁啓源 – Chairman, Chung-Hua Institution for Economic Research

Liang Qi 梁琦 – Assistant Research Professor, Energy Research Institute (NDRC)

Luo Rui 罗锐 – Energy and Resource Efficiency Advisory, International Finance Corporation

Richard Newell – Director, Duke Energy Initiative, Duke University

Keun-Wook Paik 裴根욱 – Senior Research Fellow, Oxford Institute for Energy Studies

Isaac Stone Fish – Editor, Foreign Policy Magazine

Su Bin 苏斌 – Fellow, Energy Studies Institute, National University of Singapore

Sun Guodong 孙国栋 – Assistant Professor, Stony Brook University

Sun Leihong 孙雷红 – Director, Energy Research Institute (NDRC)

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Wang Yanjia 王彦佳 – Professor of Energy Systems Analysis, Tsinghua University

Wang Zhuwei 王祝伟 – Senior Analyst, SIA Energy

Yao Yang 姚洋 – Dean, National School of Development, Beijing University

Yu Jiantuo 俞建拖 – Director, China Development Research Foundation

Yuan Jiahai 袁家海 – Associate Professor, North China Electric Power University

Akil Zaimi – Senior Research Fellow, KAPSARC

Zhang Zhongxiang (张中祥) – Distinguished Professor, Tianjin University

Zou Lele 邹乐乐 – Associate Professor, Institute of Policy and Management, CAS

About the Team



Leo Lester

Leo Lester, PhD, CFA, FRM, is a research fellow, leading the China and North East Asia research. He previously worked in strategy and portfolio development for an international oil company.



Brian Efird

Brian Efird, PhD, is a senior research fellow and program director for human geography at KAPSARC, leading teams on China, India, local content, policy, and bargaining models.



Akil Zaimi

Akil Zaimi is an engineer, petroleum economist and senior research fellow. He previously advised governments and companies on oil and gas investments, deals, financing and upstream fiscal terms.

About the Project

Our goal is to understand the context of China's energy economy, decision-making process and (even) social mores. This understanding will enable the collection of relevant and accurate data both to feed analysis and drive the interpretation of model outputs. The project aims to analyze and assess information to obtain policy relevant insights. Its focus is on investigating the global consequences of changes to energy markets within China.

The overall objective is to combine an understanding of the fundamentals of China's energy economy, derived from KAPSARC's Energy Model for China, and of the policy landscape, through the construction of the KAPSARC Energy Policy Database. The two platforms and the associated knowledge can then be used to answer a range of questions around the reform of China's energy sector, ultimately leading to an informed view on the future of China's energy mix.

In line with KAPSARC's overall objectives, the aim is to produce policy relevant insights that may assist actors outside China to understand the consequences of decisions taken by actors in China.

The Energy Workshop Series supports the overall project by providing a space for a continuing dialogue that raises the key issues, provides feedback on current work and can set future directions. In addition, the workshops are an open collaborative forum that enables the discussion of particular questions that feed into the overarching research agenda.



Notes



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