EU-Asian Energy Politics in the 21st Century

China's energy dynamics and global implications in the 21st century

INTRODUCTION

In a globalized world, energy politics are driven by the flow of energy and finance. The collapse of energy prices is sending tremors across the globe resulting in winners and losers. This is the outcome of game-changing supply and demand. On the demand side, China, the world's largest energy customer, is undergoing deep economic re-structuring and an epochal energy and environmental revolution. The goal is towards less-energy-intensive and more sustainable development. On the supply side, a Golden Age of Gas is unfolding, eclipsing coal and oil. A "Shale Gas Revolution" is changing oil politics. As a result, the United States is becoming a net energy exporter, with implications for Middle East politics. New Middle East large suppliers are also emerging on the horizon, including Iran, Iraq and Afghanistan. Meanwhile, energy security is increasingly informing global geopolitics. Russia wields considerable leverage through its pipelines in Europe. China's latest One Belt, One Road strategy is pivoting towards Europe Eurasia, and the Middle East, balancing against the United States' "Pivot to Asia". Last but not least, along with the rest of the world, a rapidly-urbanizing China is cherishing the vision of a low-carbon future. As China is likely to remain the world's largest energy consumer for a long time to come, these dynamics are set to transform the global energy landscape in the 21st century.

Economic re-structuring

According to Natixis (1), a French corporate and investment bank, the die is cast for a series of tectonic shifts towards a new economy in China. With the RMB appreciating by some 50% since 2005, energy-intensive exports such as office machines, footwear, textiles and clothing are plummeting. However, a more expensive RMB will boost the consumer power of a rapidly-expanding urban population. 81 million more urbanites will be added by 2020, pushing the urbanization rate from 54.8% to 60%. Much of the rapid urbanization is linked with a vast expansion of highways, expressways and high-speed rail. Added to this is rising demand for leisure, travel, and other quality-of-life products and services. On the other hand, industry is set to become less energy-intensive and will be driven more by research and innovation, with new possibilities in the internet, semi-conductor, robotics, and nuclear energy sectors.

Central to this changed development trajectory is comprehensive reform for economic structuring. Ahead of the much-awaited March release of the 13th Five Year Plan (2016-20), Beijing's Central Economic Work Conference has unveiled an economic blueprint, focusing, for the first time, on "***supply-side reform***". The required structural adjustment includes de-stocking of overcapacity, state-owned enterprise reform, currency and interest rate liberalization, debt and deflation management, old-age healthcare and a greener and more sustainable economy. On the cards are subsidized sales of empty housing to migrant workers and innovations to enhance productivity in finance, natural resources, manpower, equipment and technologies (2).

Energy and environmental revolution

According to a Roadmap of Chinese Academy of Sciences (3), fossil energy's share of the nation's total is expected to decline from 92.7% in 2007 to 45% by 2050, while renewable energy is expected to rise from 6.5% to 45% and nuclear energy from 0.8% to 10% over the same period.

As reported by the Brookings Institution (4), at a high-level meeting in June 2014, President Xi Jinping called for a sweeping energy revolution in China in five areas: demand, production, technology, institutional governance, and global markets. Among the aims are energy efficiency, reduced energy intensity, energy sustainability, and reduction of emissions.

In its *Intended Nationally Determined Contribution (INDC)* under the COP21 Paris Climate Agreement, China committed, by 2030, - (a) to achieve the peaking of carbon dioxide emissions around 2030 and making best efforts to peak early; (b) to lower CO2 emissions per unit of GDP (emissions intensity) by 60-65% from the 2005 level; (c) to increase the share of non-fossil fuels in primary energy consumption to around 20%; and (d) to increase forest stock volume by around 4.5 billion cubic meters over the 2005 level. A 20-billion-yuan China South-South Climate Cooperation Fund will be set up to support other developing countries in combatting climate change.

In addition, China has announced a target to reduce emissions by 40-45% by 2020 relative to 2005. In terms of energy structure, coal consumption is being tightened. A serious battle against air pollution and coal usage has already started a few years back. In September 2013, six ministries jointly launched the Air Pollution Prevention and Control Action Plan in the Beijing-Tianjin-Hebei Region. This requires PM2.5, or "fine particle," concentrations in the Region to be reduced by 25% from the 2012 level. The Region's total coal consumption is to be reduced by 83 million tons by 2017.

An Environmental Protection Law was enacted effective 1st January 2015, introducing accumulative fines with no ceiling, provision for law suits by environmental NGOs, and sharpening accountability of local governments. An Environmental Impact Assessment system is to be embedded in relevant legislation.

A new Air Pollution Prevention and Control Law came into force on 1st January, 2016. Laggard cities are required to publish detailed plans to achieve emission reduction targets with public input and regular updates. Party secretaries are increasingly held to account for their green credentials in judging their promotion prospects.

At the 2013 Communist Party's 18th Central Committee Third Plenum, China decided that markets play a decisive role in allocating resources. The market instruments include price reforms, subsidies and taxes, and emissions trading schemes (ETS).

Seven pilot ETS have been launched over 2013-2014: Shenzhen, Shanghai, Beijing, Guangdong, Tianjin, Hubei, and Chongqing. They apply to energy-intensive sectors covering 35-60% of the total emissions of the respective region and 10% of the nation's total emissions. These pilots combined make up the second-largest ETS in the world after Europe. They translate into 650

million to 700 million tons of CO2 in 2014, compared with 2.1 billion tons in Europe, 382 million tons in Australia and 165 million tons in California.

A national emission trading system (ETS) is expected to be launched in 2017 covering key industry sectors such as iron and steel, power generation, chemicals, building materials, paper-making, and non-ferrous metals.

China is also considering carbon taxes. At the China-U.S. Strategic and Economic Dialogue in July 2013, Finance Minister Lou Jiwei confirmed that China would expand environmental taxes to include carbon in due course. The tax is likely to be introduced in the 13th Five Year Plan. To avoid double impact, there could be exclusions for regions or firms already subject to ETS.

The share of non-fossil fuels in primary energy consumption is mandated to expand to 15% by 2020 and 20% by 2030. To achieve these targets, a green dispatch system is to be implemented in favour of renewable sources in electricity distribution. China's rapidly growing solar and wind capacities will support this system. Clean coal measures, coal caps and coal-free zones are to be introduced while vehicle fuel quality standards are to be enhanced.

In its INDC, China aims to double wind capacity to 200 gigawatts and to more than triple solar capacity to 100 gigawatts by 2020 from 2014 levels. This expansion is supported by the dramatic momentum of growth of non-fossil generation capacity over 2010-2014. Solar capacity has jumped by 3,161.6% to 28.05 gigawatts, wind capacity by 225.8% to 96.37 gigawatts, nuclear by 83.7% to 19.88 gigawatts, biomass by 72.4% to 9.48 gigawatts, hydro by 39.7% to 301.83 gigawatts, and geothermal by 7.1% to 0.03 gigawatts. Overall, the increase has been 73.3% to 455.64 gigawatts in just four years. (5)

Half of China's energy use today is subject to mandatory efficiency standards. With a national emissions trading scheme expected in 2017, the Chinese economy is on the way towards 85% less energy-intensive, compared to the past 25 years. With large-scale deployment of wind, solar, hydro and nuclear power, China's CO2 emission growth isexpected to flatten and then peak around 2030.

Smart cities and green cars

China's energy and environmental revolution is happening in the context of the fastest and most extensive urbanization drive in human history. By 2025, China will have 221 cities with one million–plus inhabitants—compared with 35 cities of this size in Europe today—and 23 cities with more than five million. By 2030, China's urban population is expected to hit the one billion mark. In 20 years, China's cities will have added 350 million people, more than the entire population of the United States today (6).

Such unprecedented urbanization with connecting transport networks has massive energy implications. China's total energy demand in 2040 is thus expected to double that of the United States. Over this period, China's coal consumption for power generation is expected to rise to a plateau before a slow decline.

According to McKinsey research (7), the world's top 600 cities, will account for 60% of global growth to 2025. Of 136 new cities to enter the top 600, all will be from developing countries, with 100, the lion's share, coming from China.

While cities may concentrate wealth and economic growth, they are prone to becoming hotbeds of urban divide in income, space, opportunities, and basic livelihood of food, shelter, health and education. Eco-cities are intelligent, or smart cities. A sample survey of intelligent cities around the world shows what can make all the difference - innovation, technology, competitive specialization, wireless interconnectivity, smart transport systems, smart home-linking power grids, water recycling and conservation, green energies and new materials, and integrated neighbourhoods plus affordable housing. Particularly crucial are smart grids to overcome the variability of renewable energies and the Internet of Things to connect a city's people and services. A high-level strategy of economic, social, political, regional and ecological policies as well as effective governance is a prerequisite.

According to Frost & Sullivan research, eight key aspects define a Smart City: smart governance, smart energy, smart building, smart mobility, smart infrastructure, smart technology, smart healthcare and smart citizenry. A combined market potential of US$1.5 trillion globally is estimated for the smart city market in segments of energy, transportation, healthcare, building, infrastructure, and governance (8).

Hundreds of government-led smart city pilot projects are under way across China. Local party secretaries are vying with each other for kudos. With high population density and rapid rural-urban migration, building a truly smart city in China remains the holy grail for many aspirants.

A small head start is beginning to emerge. In October 2015, *IDC Government Insights* announced Singapore and Mainland China as top winners at the 2015 "Smart City Initiatives Contest" in the Asia-Pacific region excluding Japan. China tops in 3 out of 14 categories – smart SME registration and other e-services (Beijing); integrated smart citizen card (Hangzhou); and online social welfare program (Chengdu). (9)

A vital game-changer for smart cities is green transport, including green cars. According to a Reuters report, government subsidies and other measures helped all-electric car sales soar nearly five-fold in China to 113,810 in the first 10 months of 2015. That puts China on track to soon overtake the United States as the largest market for electric vehicles (EVs) (10). The number is still small and many questions and obstacles remain, including whether there is an adequate network of electric charging stations and whether hydrogen fuel cells should instead be the key to the future. Nevertheless, once there is a credible breakthrough, China's mammoth potential green-car market is well positioned to revolutionize car industries across the globe.

Golden Age of Gas and Renewables

According to a 2011 Special Report of the International Energy Agency (IEA) (11), the world may be entering a "Golden Age of Gas". Gas use will rise by over 50% to account for 46% of US gas production and over 25% of world energy demand by 2035. It is set to become the second largest primary energy source after oil, ahead of coal. Production of unconventional gas,

primarily shale gas, is expected to triple to reach 56.5 trillion cubic ft. It will meet 40% of global increase in gas demand and command over 1 million new unconventional gas wells.

Gas is 43% and 30% less in CO2 emissions compared with coal and oil. The latter two fossil fuels together represent some 90% of China's total energy use, while 55.2% of China's oil is imported. So for environmental and national security reasons, gas holds a great deal of promise.

The U.S. Energy Information Administration (EIA) estimates that China has 1,275 TCF of technically recoverable shale gas reserve, or 19.25% of the world's total, compared with 862 TCF in the U.S. But existing hydraulic fracturing technologies, less advanced in China compared with those in the United States, are highly water-intensive and prone to aquifer contamination risks. Moreover, China's reserve is in much more difficult topography.

Shale gas is therefore a mixed blessing to a water-scarce and polluted China. IEA studies have shown that shale gas may serve as a bridging lower-emission fuel only if supported by a package of fuel pricing, cap-and-trade, carbon tax, and low-carbon technologies, including gas-fire efficiency and carbon capture and storage, backed by the highest social and environmental safeguards.

The United States has indicated willingness to share advanced shale gas technologies and the Chinese government is introducing subsidies for shale gas production. While the prognosis for the future of shale gas is positive, great care must be exercised in adopting any piecemeal approach lest renewable energies may be sidelined and low-carbon targets compromised.

However, the dynamics for gas are changing. There is currently a world glut of fossil energy including oil and gas. US oil production has doubled since 2008. The shale revolution has added another 3 million barrels a day. New suppliers are coming up on the horizon. For example, post-sanction Iran is poised to add 500,000 barrels a day to world markets. On the demand side, the world's biggest energy customer, China, is slowing down and changing course towards a less energy-intensive economy. Against a world market of 94 million barrels of oil a day, there is now an excess of one to two million barrels a day. Moreover, coal remains extraordinarily cheap and bountiful.

Meanwhile, with their prices coming down rapidly, renewable energies are gaining vast market share. According to a new IEA report (12), they account for more than 45% of electricity generating capacity added worldwide, growing to more than half of new capacity over the next five years. By 2020 renewables should be providing over 26% of global electricity supplies. A golden age of renewables is unfolding.

So with dropping prices, the gas market is spluttering, squeezed between renewables and coal. Nevertheless, as a cleaner fuel than oil and coal, thanks to its volume and portability, gas is likely to return to prominence with lower prices benefiting the end user. (13).

Geopolitics of collapsing energy prices

Thanks to supply glut and shrinking global demand, oil prices are plummeting from above $100 a barrel just two years ago to $30 and below. To sustain the viability of the shale gas revolution, a price of at least $65 a barrel is needed. The current oil price plunge has resulted in massive layoffs and foreclosures in US oil boomtowns. In Texas, for example, rig count is down to a third. It is estimated that the ongoing old price slide is likely to cost the United States quarter of a million jobs (14).

The collapse of energy prices is sending tremors well beyond the United States. An interactive chart (15) of *The Economist* (7 January, 2016) shows that, even at $40 a barrel, production in nearly all non-OPEC countries, including the United States, Russia, Canada, Brazil, Mexico and China, would become largely non-viable. At $20 a barrel, only the largest OPEC producers (Saudi Arabia, Iraq, Iran, Kuwait, and the UAE) would barely stay above water, partially. Indeed, the breakeven oil price for government budgets is much higher (16). For example, the threshold is around $160 a barrel for Venezuela, about $138 for Iran, $118 for Iraq, $100 for Saudi Arabia and Russia, and $80 for the United Arab Emirates (UAE). Even at $65 a barrel, all these oil producing countries would be in deficit.

The geopolitical implications are huge. Much of the geopolitical leverage of large energy producers, notably Russia and Saudi Arabia, owes itself to command of high energy prices. Now the rug is being pulled from under their feet. As for winners, apart from individual end-users, no other beneficiary comes close to China. Apart from lowering production costs, a buyer's market empowers China, as the world's biggest energy customer, to drive a hard bargain. She is also gaining immense geopolitical leverage with producers heavily dependent on energy exports.

Russia, already under Western sanctions, will become even more desperate in building energy ties with China. In addition, Russia's future energy contracts with China are likely to be priced in the Renminbi following its recognition by the IMF as the world's no. 3 leading world currency.

It's also no surprise that President Xi Jinping made his first state visits to Saudi Arabia, Iran and Egypt, lynchpins of the geopolitics in the Middle East. The visit was opportune in the context of the ongoing Syrian crisis where China would be seen to play a bigger role as a global power.

What is more, the visit would help realize China's trans-continental initiative of "One Belt, One Road" (OBOR) (17). This seeks to deepen China's global centrality by connecting to Asia, Europe, Eurasia and the Middle East, through infrastructural investments in pipelines, high-speed rail, and expanded trade, investments and other ties. OBOR is backed by a $40 billion Silk Road Fund and a new China-led Asia Infrastructural Investment Bank (AIIB), which attracted 57 founding members worldwide, including many Western allies, with more than 20 countries on the waiting list to join as members.

This Silk Road initiative will reinforce China's expanding energy pipelines across Eurasia, Central Asia and the Middle East, capitalizing on China's leading role in the Eurasia-centric Shanghai Cooperation Organization (SCO). For example, China is becoming a lynchpin in the Iran-Pakistan (IP) and Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipelines. Both are

likely to connect to the China-Pakistan economic corridor, linking Xinjiang (China's energy base) to the Persian Gulf.

OBOR is also designed to reduce China's exposure to the "Malacca Dilemma" (18) where the transit of energy, China's lifeblood, is vulnerable to choke points controlled by the United States. Additionally, China's energy diplomacy with Russia and the Middle East also informs a re-balance against America's "Pivot to Asia", including the US-led Trans-Pacific Partnership (TPP) excluding China.

Arctic Geopolitics of Climate Change

With the melting of Arctic icesheets due to Climate Change, navigation channels are becoming possible through Russia's northern sea route, the Bering Strait and Canada's Northern Passage, providing much shorter shipping links between the Pacific and the Atlantic Oceans. At the same time, a cornucopia of submerged energy and other Arctic resources is beginning to be accessible (19). New Arctic shipping routes are likely to diminish the importance of China's container ports in the Pacific. Nor does China enjoy any territorial claims over Arctic's natural resources.

Be that as it may, the Arctic is vital to the ecosystem of the whole planet, including ocean acidity, climate-changing currents, food chains and species survival, not to mention other global revulsions of Climate Change. There is a strong argument that the Arctic should remain a common heritage, which the Arctic "sovereign countries" should hold in trust for humanity.

China has been proactive in joining the Arctic Council as a Permanent Observer, alongside with other Asian countries comprising India, Japan, Republic of Korea and Singapore. In addition, China is developing close ties with Scandinavian countries such as Denmark, Norway, Iceland and Finland. Of course, China's interests in the Arctic are not only confined to ecology. For example, China is also investing in Greenland's rare earth (20).

Conclusion

"Money makes the world go around," so go the lyrics. But it would be even more true of energy, physically, economically, financially and geopolitically. Caught in a confluence of fossil energy glut, collapsing energy prices, a shale gas revolution, a green revolution and increasing energy geopolitics, the energy dynamics of China, as the largest energy user and a rising global power, are bound to shake the world.

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