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## Annual Meeting of the New Champions 2013

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**By the World Economic Forum in collaboration with**

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### **China's economic restructuring and energy reforms are key to the energy sector**

China is the world's most populous country and has a rapidly growing economy, which has driven the country's high overall energy demand and the quest for securing energy resources. Today, the country has entered a phase of economic restructuring and is working to achieve ambitious energy targets under a new political leadership. China's new leaders, have shown a tolerance for slower growth, while pressing ahead with efforts to revamp the economy for the longer term through structural adjustment, reforms and promoting economic transformation.

The government's economic growth target is 7.5 per cent for this year. Although the economic growth rates of recent years will be hard to replicate in the economic rebalancing phase the country has entered, China's economic weight and growth renders its energy choices crucial to the future development of energy markets and technologies globally – and to the development of China itself. With the current 5 year plan, the country is pursuing ambitious targets for reducing its energy and carbon intensities diversifying its energy mix and developing new emerging industries in energy.

### ***China's is expanding all energy sources with the energy mix still being dominated by coal***

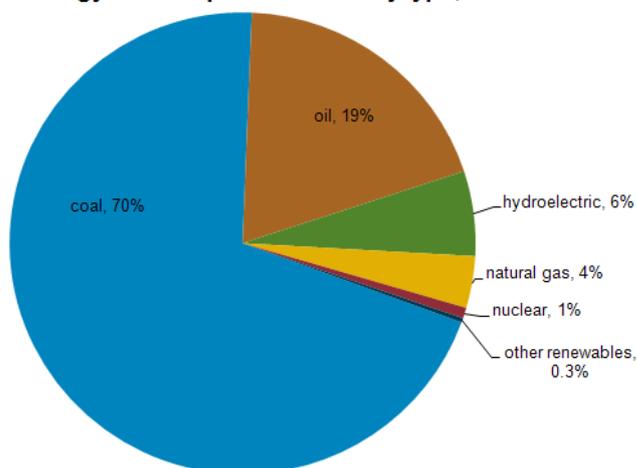
China is today the largest global energy consumer and the world's second largest oil consumer behind the United States and likely to overtake US as the world's biggest oil importer in the near future according to the International Energy Agency's 2012 World Energy Outlook.

Although starting from a low base, natural gas usage in China has increased rapidly in recent years, and the country is working to raise gas imports via pipeline and LNG as well as developing unconventional gas resources. China's 12th five-year plan calls for natural gas to provide 8 per-cent of China's energy mix in 2015 and 10 per-cent in 2020 up from 4 per cent in 2009. The country also aims to develop its shale gas resources – estimated to be the biggest in the world – to produce 6.5 billion cubic meters of shale gas a year by the end of 2015. However, a replication of the US shale gas boom cannot be expected in the short term

due to factors such as less developed gas infrastructure and markets as well as complex geology and shortage of technical expertise. In fact, there is a growing view among analysts that China is unlikely to meet its 2015 shale gas production target after slower than expected development of initial shale gas fields<sup>1</sup>. About 100 shale gas wells have been drilled in China over the past years compared to around 1000 in the US annually.

A factor that has deterred investment is that state-set gas prices have been kept fairly low for years. However, China is carrying out a two steps gas pricing reform to gradually increase gas prices to market levels by 2015. The government recently announced a 15 per cent hike in non-residential gas prices, a move that could speed up China's expansion in conventional and unconventional gas. On the electricity side, the National Development and Reform Commission (NDRC) announced in June this year that it will begin a gradual overhaul of China's electricity pricing system. The current system prices electricity depending on what it is used for, and prices differ depending on the category of customer (of which there are eight) and also the voltage and grade of electricity a customer is using.

**Total energy consumption in China by type, 2009**



Source: U.S. Energy Information Administration, *International Statistics*

In the effort to diversify its energy mix, China has also built a significant renewable energy industry and has risen to become the world's top investor in clean energies<sup>2</sup> 10 years ago China had virtually no industry in renewable energy but today it has the largest installed capacity of wind power in the world and is the world's largest producer of solar modules. China is now the single largest market for electricity generation from renewables, at 18% of electricity generation in 2010, and is expected to increase the share of renewables in electricity generation to 27% in 2035 according to the International Energy Agency<sup>3</sup>. Recently, China established regional benchmark tariffs for photovoltaic power generation to provide subsidies for distributed solar power generation.

Coal still dominates the energy balance and the statistics are staggering; China now uses around 3.8 billion tons of coal each year, nearly as much as the rest of the world combined.

<sup>1</sup> FT Online 2 July 2013 <http://www.ft.com/intl/cms/s/0/b7013e58-e31b-11e2-9bb2-00144feabdc0.html#axzz2cmH1VtqX>

<sup>2</sup> Bloomberg New Energy Finance : <http://about.bnef.com/press-releases/us-china-south-africa-lead-rebound-in-clean-energy-investment/>

<sup>3</sup> World Energy Outlook 2012, International Energy Agency

In 2002, coal accounted for 63.9% of primary energy consumption and in 2009, the figure rose to 69.1%. At the same time, heavy industry accounted for 60.9% of total industry output, and in 2011, the figure was 71.9%<sup>4</sup>. 2012 saw the growth in coal consumption slow, certainly linked to slowing economic growth and stronger focus on efficiency and local air pollution.

The IEA's *World Energy Outlook 2012* highlights that China is set to play a decisive role in global energy markets over the coming decades. It projects the country to make the biggest contribution (33%) to the growth in global energy use through to 2035, with its demand rising by 60%. This sees China consolidate its position as the world's largest energy consumer and, by 2035, its use is 77% higher than the second-placed United States (though China's use is 52% lower on a per-capita basis).

A key question is how fast gas, nuclear and renewables will grow to take market share from coal in China and what policies will shape that. Also, the next steps of the gas and electricity reforms will be important for attracting investments.

### ***Increasing Environmental pressures are already impacting the energy sector***

Emissions from coal consumption and the transportation sector are among the main causes for increasing environmental concern. The cost of environmental degradation in China was about \$230 billion in 2010, or 3.5 per-cent of the nation's gross domestic product according to a recent study by the Chinese Academy of Environmental Planning<sup>5</sup>. Urban pollution and haze covering major cities in China has received media attention globally and sparked public outcry locally, leading the government to take action to mitigate the environmental challenge.

The Chinese government is responding by introducing a range of measures affecting energy generation, refineries, and the transportation industry and infrastructure management in cities. Actions envisaged by the Government include policies to increase gasoline and diesel standards to National 5, which is equivalent to Europe 5, by 2018 and remove some energy intensive industries from urban areas. China has already started to pilot test limiting coal consumption in some economic advanced areas as an effort to reduce urban pollution, at the same time to force economic structural adjustment. China has also recently provided more incentives for coal fired power plants to reduce their emissions.

With industrial activity accounting for around half of China's annual coal demand, reducing its energy intensity is key to resolving environmental challenges. Although measures to drive energy efficiency are likely to have cost implications associated with upgrades to existing infrastructure, this also presents opportunities as industry becomes more efficient and reduces energy-related costs.

Another environment factor that over time can impact China's energy strategy is freshwater availability. Energy production is a major source of water consumption and temporary water withdrawal. As available freshwater resources in China become increasingly scarce, it could make power production increasingly vulnerable to water shortage and impact energy investments<sup>6</sup>. The IEA's *World Energy Outlook 2012* projects that water consumed by China's

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<sup>4</sup> World Economic Forum background paper 2013 by Professor Lin Boqiang, Director, China Center for Energy Economics Research (CCEER), Xiamen University, People's Republic of China

<sup>5</sup> New York Times Asia Pacific Online: [http://www.nytimes.com/2013/03/30/world/asia/cost-of-environmental-degradation-in-china-is-growing.html?\\_r=0](http://www.nytimes.com/2013/03/30/world/asia/cost-of-environmental-degradation-in-china-is-growing.html?_r=0)

<sup>6</sup> See for instance Bloomberg New Energy Finance March 2013: <http://about.bnef.com/press-releases/chinas-power-utilities-exposed-to-water-disruption/>

energy sector will have to rise by 83% (or 14 billion cubic metres (bcm) between 2010 and 2035), increasing pressure on water resources. This includes water for power generation, the extraction, transport and processing of fossil fuels, and the irrigation of biofuels feedstock crops.

A concern for Beijing and for local governments – is how to strike a balance between controlling emissions and maintaining economic growth especially amid a general slowdown in the economy. One small but interesting development is that China launched its first carbon trading scheme pilot in Shenzhen as part of a set of pilot schemes due to be launched this year and next. China is also taking action on short-lived climate gases and has agreed with the United States to work together to reduce the use of hydrofluorocarbons used in refrigerators, air conditioners, and industrial applications.<sup>7</sup>

Looking forward key questions include what policy measures will be implemented following the increasing environmental pressures and how will they impact the energy sectors.

### **New Developments in China's international energy collaborations can be a game-changer**

China is in the process of opening up several new major sources of oil and gas supplies and increasing its strategic energy collaborations. During President Xi's first state visit abroad to Russia, the two countries identified energy as a priority areas for future cooperation and vowed to build a strategic energy relationship by cooperating on oil, natural gas, coal and electricity. Major deals have recently been made between the two countries. Among them is a \$270 billion agreement with Rosneft - one of the biggest in the history of the global oil industry- to double oil supplies to China.

China already buys nearly half the oil that Iraq produces today and Chinese oil majors are set to increase investments in Iraq's oil sector in what emerges as a strategic collaboration for both countries<sup>8</sup>. There are also several joint energy and infrastructure projects under way between Pakistan and China not to forget the new Myanmar-China oil and gas pipelines that will boost supplies and open up a new strategic route for China circumventing the Malacca strait. Once the gas and oil pipelines both are in operation, they will have a capacity of 12 billion cubic metres per year of natural gas and 440,000 barrels per day of crude oil respectively.

In landmark discussions between the world's two superpowers US and China, the two countries have agreed on a suite of potentially far-reaching initiatives aimed at energy and cutting greenhouse gas emissions focussing on five broad areas. These include cutting down on emissions from heavy transport, strengthening energy efficiency, and improving the collection of greenhouse gas-related data. Washington and Beijing also aim to step up research into new "carbon capture" technologies at coal-fired power plants, and collaborate on building new "smart" electrical grids.<sup>9</sup>

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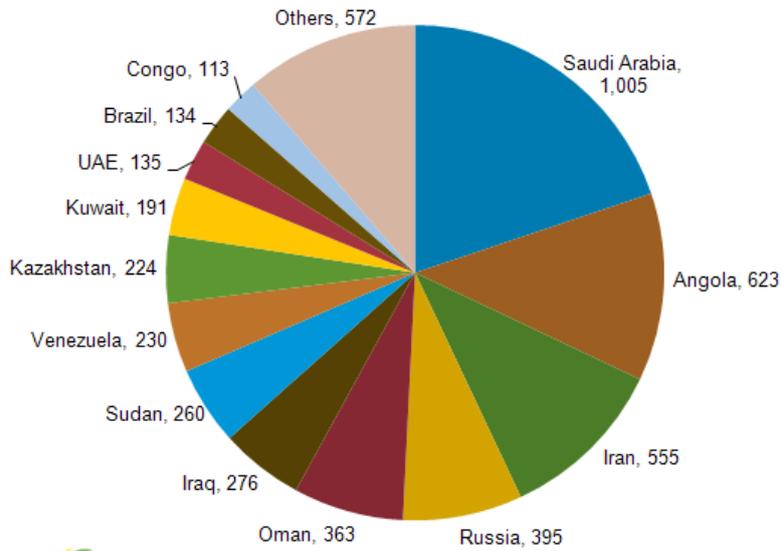
<sup>7</sup> The White House: <http://www.whitehouse.gov/the-press-office/2013/06/08/united-states-and-china-agree-work-together-phase-down-hfcs>

<sup>8</sup> New York Times online 2 June 2013 : [http://www.nytimes.com/2013/06/03/world/middleeast/china-reaps-biggest-benefits-of-iraq-oil-boom.html?\\_r=1&adxnnl=1&pagewanted=all&adxnnlx=1377252204-I+DbTxxuVtO5IyaP68oUHQ](http://www.nytimes.com/2013/06/03/world/middleeast/china-reaps-biggest-benefits-of-iraq-oil-boom.html?_r=1&adxnnl=1&pagewanted=all&adxnnlx=1377252204-I+DbTxxuVtO5IyaP68oUHQ)

<sup>9</sup> US Department of State: <http://www.state.gov/e/oes/rls/pr/2013/211842.htm>

### China's crude oil imports by source, 2011

thousand barrels per day



 Source: FACTS Global Energy

In sum, these and other international collaborations in which China is involved can significantly impact the development of China's energy sector and global energy markets.