

## China's Booming Gas Sector: Threat or Promise?

By Philip Andrews-Speed\*

China's domestic natural gas sector has changed beyond recognition over the last twenty years. Back in the early 1990's, annual domestic production was about 16 billion cubic meters and natural gas accounted for about 2% of total primary energy supply. Most of the gas was produced and used in just two regions, Sichuan in the south-west and Daqing in the north-east. Any company seeking to explore for and develop new gas fields would be told by the government that the preferred use for the gas was for manufacturing fertiliser – not an attractive commercial prospect, even for a Chinese national oil company.

The discovery, in the early 1990s, of new gas accumulations in the Ordos Basin in north-central China changed that outlook. The country's economy was growing rapidly, driving up energy demand, and the government realised that natural gas could provide not just additional supplies of energy but also that this energy was clean. Thus the first use for these new gas supplies in the late 1990s was to provide gas for heating, cooking and industrial uses in the cities of northern China, including Beijing. The progressive enlargement of these gas reserves in northern China and the discovery of new gas fields in north-west China encouraged the construction of a network of gas pipelines spanning the breadth of the country and triggered a new pricing regime that seeks to promote the exploitation of natural gas.

By 2010, annual domestic production of natural gas had risen to 95 billion cubic meters, six times that of twenty years earlier, and annual consumption had reached 107 billion cubic meters. These figures are at the very top end of the projections and targets set ten years ago. The one target which has not been met was the goal set in the late 1990s, that natural gas should account for 8% of primary energy supply in the year 2010. Instead it accounts for just under 4%. But this is not a failure of the gas industry, rather it represents a failure to constrain total energy demand. Also, ten years ago, many observers expected that much of the new gas supply would be directed at power generation, but this was not the case. Instead, industry accounts for 60% of demand and the residential sector (city gas) 20% , whilst only 20% goes to power generation.

The gap between consumption and domestic production has been filled, first, by liquefied natural gas (LNG) and, since last year, by gas from Turkmenistan supplied by pipeline. Total gas imports in 2010 amounted to about 16 billion cubic meters. Imports will continue to grow rapidly. CNOOC has recently started construction on its fourth LNG terminal. CNPC's first LNG terminal, in Jiangsu, will receive its first shipment of gas this year. Its terminal in Dalian is near completion and construction on its third LNG terminal will start in Tangshan this year. The total annual quantity of LNG contracted for the year 2014 already exceeds 30 billion cubic meters, mainly from Australia, Southeast Asia and the Middle East.

Flows of gas through the pipeline from Turkmenistan will progressively build up, reaching an expected 15 billion cubic metres in 2011 and rising to 30 billion cubic meters or more by 2015. In December 2010, construction started on a pipeline to bring gas from Kazakhstan to China. A new pipeline from Myanmar could supply a further 12 billion cubic meters by 2012.

These LNG and pipeline projects together could provide China with at least 60 billion cubic meters per year of gas imports by 2015. This amount may be further supplemented in due course by natural gas supplied by Russia along two pipelines, with a total capacity of nearly 70 billion cubic meters. Discussion between the two countries over gas supplies have continued on and off for almost twenty years. It is too early to say whether the current round of talks will indeed yield a deal, though the completion of the oil pipeline from Skovorodino may be a favourable sign.

Such plans and statistics will have formed the basis of the government's recent announcement that gas imports are expected to rise to 90 billion cubic meters by 2015, and that domestic production may grow to 170 billion cubic meters, with contributions from unconventional gas. This implies a total annual consumption in 2015 of 260 billion cubic meters, 2.4 times that in 2010, and an annual rate of growth of 20%. This is faster than the average of 18% over the previous five years. If these goals were to be achieved, the share of natural gas in China's primary energy supply might indeed reach 8% by 2015, which was the target originally set for the year 2010.

Such a growth in China's gas sector would place it behind the USA and Russia as the third largest gas user in the world and among the largest importers of gas, alongside Japan and Germany, and possibly the USA. Over the last decade or so, China has become progressively more dependent on international energy markets for imports, first for oil, then for coal and now for gas. Whilst this trend yields many benefits in terms of integrating China into the world economy, the scale of the country's energy sector means that small changes in the annual import requirement can

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have major impacts on international energy markets, driving prices sharply up or down in the short-term. We have seen this happen for oil and coal, we should now expect the same in natural gas markets.

However, the wider benefit of greater gas use is that China's energy sector will become progressively cleaner and more efficient, assisting the country's move to a low-carbon economy. The real question at this stage is whether the country's gas industry can successfully manage such rapid growth over the next five years. This will require coordination of construction and operation from well-head to burner-tip over a vast area and involving thousands of businesses and millions of households. Past performance in the domestic coal and natural gas industries during periods of rapid growth suggests that disruptions and discontinuities are likely to occur on account of the scale and complexity of the task, and through the ambiguity of policy instruments and economic incentives.

### IAEE/Affiliate Master Calendar of Events

(Note: All conferences are presented in English unless otherwise noted)

Date	Event, Event Title and Language	Location	Supporting Organizations(s)	Contact
<b>2011</b>				
October 9-12	30th USAEE/IAEE North American Conference <i>Redefining the Energy Economy: Changing Roles of Industry, Government and Research</i> <a href="http://www.usaee.org/USAEE2011/">http://www.usaee.org/USAEE2011/</a>	Washington, DC	USAEE/NCAC/IAEE	USAEE Headquarters usaee@usaee.org
<b>2012</b>				
January 6-8	Annual ASSA Meetings <i>Energy Commodity Prices, Capital Flows &amp; Balance of Payments // Topics in Energy Modeling</i>	Chicago, IL	IAEE/USAEE	Ken Medlock medlock@rice.edu
January 26-27	7th Spanish AEE Conference <i>Call for Papers Open until November 13</i> <a href="http://www.aeee.es/en/activities.php">www.aeee.es/en/activities.php</a>	Pamplona, Spain	SAEE	Enrique Loreda Fernandez eloreda@uniiovi.es
February 20-22	3rd IAEE Asian Conference <i>Growing Energy Demand, Energy Security and the Environment in Asia</i>	Kyoto, Japan	IEEJ	Kenichi Matsui kmatsuijr@aol.com
April 23-24	5th NAEE/IAEE Conference Energy Technology and Infrastructure for Sustainable Development	Abuja, Nigeria	NAEE	Adeola Adenikinju adeolaadenikinju@yahoo.com
June 24-27,	35th IAEE International Conference <i>Energy Markets Evolution under Global Carbon Constraints: Assessing Kyoto and Looking Forward</i>	Perth, Australia	AAEE/IAEE	Ron Ripple r.ripple@curtin.edu.au
September 9-12	12th IAEE European Conference <i>Energy Challenge and Environmental Sustainability</i>	Venice, Italy	AIEE/IAEE	Edgardo Curcio e.curcio@aiee.it
November 4-7	31st USAEE/IAEE North American Conference <i>Transition to a Sustainable Energy Era/ Opportunities and Challenges</i>	Austin, Texas	USAEE/CTAEE/IAEE	USAEE Headquarters usaee@usaee.org
<b>2013</b>				
April 8-9	4th ELAEE Conference Theme TBA	Montevideo, Uruguay	LAAEE	Marisa Leon melon@adme.com.uy
June 23-27	36th IAEE International Conference <i>Energy Transition and Policy Challenges</i>	Daegu, Korea	KRAEE/IAEE	HoesungLee