UNCONVENTIONAL GAS AND LNG: THE YIN AND YANG OF CHINESE NATURAL GAS PLANNING

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ABSTRACT

China’s latest Five-Year Plan shows ambitious targets for CBM and shale gas – 31 bcm of CBM in 2015 and 50 bcm in 2020, and 6.5 bcm of shale gas in 2015 and 60-100 bcm in 2020. But China’s Five-Year Plan has historically overestimated CBM production. The shortfall spurred China’s entry into the LNG industry as it was forced to look abroad for gas resources to close the supply gap in its plan. History could repeat itself in the new Five-Year Plan considering various potential problems with shale gas development. This potential shortfall could require China to secure more gas from other sources, including LNG. With this hypothesis, Poten will test the likelihood of how LNG imports might be boosted or reduced, and how unconventional gas production may force China to alter its plans. Moreover, losses generated by regulated (subsidized) retail gas prices could hinder growth of LNG import terminals. The capped prices may be causing project developers to re-evaluate terminal development plans, and to focus more on expansion of existing terminals and improved efficiency rates. Poten will discuss the economics of subsidy, and how they could complicate Chinese efforts to shift back toward LNG to expeditiously deal with emerging supply shortfalls due to shale gas underperformance.

BACKGROUND

China’s latest Five-Year Plan shows ambitious targets for CBM and shale gas production – 31 bcm of CBM (coal bed methane) and 6.5 bcm of shale gas in 2015. In addition, the preliminary 12th Five-Year plan released earlier last year aimed at achieving 50 bcm for CBM production and 60-100 bcm for shale gas production in 2020.

But China’s Five-Year Plan has historically overestimated CBM production. For example, in the 11th Five-Year Plan, China targeted 8 bcm of utilized CBM production in 2010, but the actual utilized CBM production was less 4 bcm, which was only 50% of the target. The shortfall spurred China’s entry into the LNG industry as it was forced to look abroad for gas resources to close the supply gap in its plan. History could repeat itself in the latest Five-Year Plan considering various potential problems with shale gas development. This potential shortfall could require China to secure more gas from other sources, including LNG. With this hypothesis, the paper will test the likelihood of how LNG imports might be boosted or reduced, and how unconventional gas production may force China to alter its plans.

Moreover, losses generated by regulated (subsidized) retail gas prices could hinder growth of LNG import terminals. The capped prices may cause project developers to re-evaluate terminal development plans, and to focus more on expansion of existing terminals and improved efficiency rates. This paper will discuss the
economics of subsidy, and how it could complicate Chinese efforts to shift back toward LNG to expeditiously deal with emerging supply shortfalls due to shale gas underperformance.

The Yin and Yang of the title of this paper refers to the tension between domestic shale gas and LNG, with higher shale gas production leading to lower LNG and vice versa. Within the Chinese market the two seem diametrically opposed, but internationally there is an opportunity for complementary opposition, for example in Canada, where Chinese companies are acquiring shale gas assets that could produce feedgas for future LNG exports to China.

CHINA’S GAS DEMAND HAS BEEN PROLIFERATING

China’s economy has been growing at exceptional pace with GDP growth rate around 10% during 2005-2012 period. Various energy sources will be required to support this growth, but environmental concerns are growing globally, including in China where carbon dioxide emission level has been the world’s highest since 2008. The drive to manage carbon dioxide emission level, maintain robust economy growth, and reduce the country’s dependence on coal, has led to strong growth in using natural gas as a fuel. Natural gas is a cleaner energy source compared to coal and oil with reasonable amount of capital investment and construction time, and so it has become a prime energy source for China to focus on throughout the next decade. As a result, China’s 12th Five Year Plan promotes the use of natural gas. The plan aims at reducing carbon intensity to 40 - 45% below 2005 level by year 2020, and targets aggressive natural gas consumption level of 8.3% share in China’s primary energy mix by 2015. However, to fulfill this target, China would need to boost its domestic gas production to 176 bcm/y by 2015, and need to import approximately 94 bcm of natural gas by 2015.

**Pipeline imports**: The government plans for pipeline gas imports to reach 50 bcm in 2015 according to its preliminary 12th Five-Year plan (including pipeline gas from Myanmar and Turkmenistan). China started importing pipeline gas from Turkmenistan since 2010, and achieved a total of 21 bcm/y gas import in 2012. We believe gas import from Central Asia will continue to grow strongly by the end of this decade and achieve its full capacity of 40 bcm/y by 2020, especially when the planned pipeline gas from Myanmar could start its first gas by the end of May 2013. However, the development of the 800 km onshore pipeline from Burma’s Rakhine state to China’s Yunnan province appears to have many issues that need to be mitigated. These are mainly concerns raised by the environmental groups and local residents such as land acquisitions, environmental degradation, human rights and labor issues, and transportation difficulties related to roads damaged during construction. China also has a potential to import large volume as high as 68 Bcm/y of pipeline gas from Russia, but this may not happen in the near term, and likely to be post 2020, due to an ongoing price negotiation between the two countries.
**LNG imports:** In the preliminary 12th Five-Year Plan, China aims at securing LNG supply portfolio that would contribute to about 15% of China’s total gas supply, which is equivalent to 29 MMT/y in 2015. If this extrapolated trend (as illustrated in the chart in the previous page) continues, LNG import in China will increase to 55 MMT/y by 2020. This is similar to our base case forecast that the LNG requirement for China in 2020 is around 52 MMT/y. China imported over 10 MMT LNG in 2011, which comprised over 10% of the total gas consumption. Currently, there are eight terminals in operation (including two small scale terminals in Shanghai and Dongguan) and nine terminals under construction with total capacity of 52.6 MMT/y by 2016.

**Domestic production (conventional and unconventional):** The government plans to ramp up China’s domestic gas production to 176 bcm in 2015. We view that domestic gas production will still be a very important source of gas supply but its percentage to total gas supply has already been reduced from 95% in 2008 to less than 80% in 2011, and will be further reduced to around two thirds in 2015 according to its 12th Five-Year Plan. Unless the unconventional gas production could be produced at the level the government has ambitiously planned for, 37.5 bcm in 2015, the percentage of domestic gas production to total gas supply could move below 60% level of total production. However, if this extrapolation of this government targeted growth trend continues, we forecast that the domestic production will reach 290 bcm/y by 2020.

**CHINA’S AGGRESSIVE UNCONVENTIONAL GAS PRODUCTION TARGET**

Premium LNG pricing in Asia Pacific and uncertainties related to large volume of gas imports via pipeline have led the Chinese government to aggressively seek to commercialize its domestic resources, especially its gigantic shale gas and CBM resources.

CNPC (China National Petroleum Corp) Sinopec and Yancheng Petroleum are leading the charge with the three firms testing 19 shale gas wells by the end of 2011. Of these wells, two were drilled horizontally and 17 vertically. CNPC was the first to enter the business in 2006 and has designated Chongqing and Weiyuan as a national pilot test area. The firm also drilled China’s first horizontal shale gas well, Wei 201-H1 in the Weiyuan field, which was stage-fractured. Sinopec started shale drilling in 2008 focusing on Jianghan, where the firm has tested five exploration wells, drilled, and stage fractured a horizontal well last September. Yanchang, which is one of the four qualified enterprises for oil and gas exploration in China after CNPC, Sinopec and CNOOC, was the last to start exploring for shale gas. Since 2009 the firm has drilled a dozen wells.

China’s ambitious unconventional gas production targets for both shale gas and CBM by 2015, combined with the potential enormous size of Chinese domestic gas markets and unconventional gas resources of around 1,000 Tcf (both shale gas and CBM), have attracted many upstream developers including the super majors such as Shell, Exxon, Chevron, ConocoPhillips, Total, and BP to explore China’s shale gas resources. Shell was the first foreign company to establish a toehold in China’s fledgling shale sector, signing a production sharing contract with CNPC to explore, develop and produce the gas in March 2012, even though scarcity of water resources near the main shale plays amongst other problems could be obstacles in monetizing these mammoth shale gas resources expeditiously.

Recently, China released the result of the second round of shale gas block bidding held in October 2012, and 16 companies won the right to prospect 19 shale gas blocks with a combined investment of around $2 billion USD to explore the shale gas blocks over the next three year. Unlike the first bid held in the mid-2011, when only four blocks were open for six state-owned oil and gas companies - CNPC, Sinopec, CNOOC, Yanchang Petroleum, China Union CBM and Henan CSG Development & Utilization Corp, the second bidding round was open to all Chinese companies, and joint ventures with foreign companies holding minority stake. However, none of these joint ventures with foreign companies were selected.
BUT SHALE GAS IN CHINA MAY TAKE TIME TO MATERIALIZ

Although unconventional gas development in China has positive long term prospects due to its massive resource base, a lot of challenges need to be managed carefully and promptly.

**Land Acquisition:** Shale gas requires significant land access. The government would need to focus on setting up policy and action plans for the land owners regarding the land owner’s rights and compensation for the owners in agricultural areas, and in conservation areas and tribal lands. For example, Sichuan basin, which is one of the largest shale plays in China, is located in a dense population area. Although local opposition is not critical as in Europe or in North East US, in order to reach the government’s aggressive shale gas production target in 2015 and 2020, many more wells will be required to drill, and hence significant more land acquisition including extensive negotiation with landowners on their relocation will likely to take place, and these activities could be lengthy. In addition, Sichuan basin is located in mountainous regions, which could cause logistical challenges for the shale gas development where access roads and many infrastructures are required.

**Geology:** Overwhelming opinion in the industry warns that it will take years before China’s shale resources can be developed on a large scale because of complex geology that makes it difficult to successfully employ the technologies which have proved so successful in North America. For example, many of China’s resources are in difficult terrain such as the heavily faulted Sichuan basin. The deposits also have more clay than the brittle shales in the US, which make the US shales easier to be fractured. This may have led to mixed results in the wells drilled to date in China.

**Water Resources:** China’s shale plays face tough challenges on water resource constraints near major shale plays. Multi-stage hydraulic fracturing, which is an essential part of successful shale gas development, requires massive amount of water that the country may not have or be able to use for shale gas development purpose. Unlike in the US, where water resource is generally available near most shale plays, in China many of the major shale plays are located either in the areas that already faces water scarcity issues for residential use or in the western desert which simply does not have a lot of water. For example,
Tarim basin in the northwest region is over a thousand miles away from the main source of water in the country.

**Pipeline Infrastructure:** China also lacks the extensive pipeline network that spans the US to deliver output to distant markets. Feeder lines will have to be built to link into the three West-East pipelines that are already booked to carry gas from Central Asia to consumption centers in the industrialized east of the country. The long distance between major shale plays and the major gas consuming markets posts challenges for developers as pipeline infrastructure creates additional costs for shale gas development.

**Local Industry Services:** China intends to make shale gas technology improvements and localize the manufacture of major equipment. It is also planning to establish industry standards and create government policies. As part of this effort, the NEA (National Energy Administration) plans to establish 19 key exploration and production zones between now and 2015 in 13 provinces and regions including Sichuan, Chongqing, Guizhou, Hunan, Hubei, Yunnan, Anhui, Jingxi, Shaanxi, Liaoning and Xinjiang. However, in contrast to the US, China does not have a large ecosystem of independent and innovative exploration, drilling, and development companies who may be able to contribute a lot to the country’s ambitious shale gas production target. China would need to have sufficient technology and equipment availability, mature services sector, and, large skilled and experienced workforce in order to achieve its goal. China also needs to build extensive service infrastructure and a supply chain to transport and manage equipment, and large quantities of water.

The Chinese national-owned companies (NOCs), which are PetroChina, Sinopec and CNOOC, are all seeking technology and experience through partnerships in unconventional gas project development in the US, Canada and Australia with the hopes that recent acquisitions would help them obtain extensive E&P (exploration and production) experience for unconventional gas projects from other experienced project partners. In North America, PetroChina, Sinopec and CNOOC all bought into upstream shale gas assets, For example, the recent $15 billion deal to take over Nexen in Canada will largely enable CNOOC to gain control of 300,000 acres of shale gas lands in northeastern British Columbia (BC). PetroChina bought 20% from Shell for its shale gas assets in Groundbirch, BC, and Sinopec also bought 33.3% equity from Devon Energy for five emerging gas fields (four are shale plays) in the US around the same time. In Australia, PetroChina, Sinopec, and CNOOC all are significant shareholders in the Australian CBM-to-LNG business. For example, PetroChina has a 50/50 joint venture with Shell in Arrow LNG project, and participated in the small scale Fisherman’s Landing LNG project with LNG Ltd. Sinopec bought a total of 25% equity in APLNG project, and CNOOC also recently increased its stake in the BG led Queensland Curtis LNG project.

**Fiscal regime:** Shale gas project development is different from conventional gas development, where CAPEX (capital expenditure) intensity only takes place during early life of a project, and low continuous re-investment is required to maintain production. Shale gas project development has higher lifecycle of CAPEX because shale development requires continuous re-investment in new wells in order to maintain gas production due to faster decline rates. However, the best fiscal regime for shale gas development in China is still debatable.

On the other hand, China is considering implementing subsidies for domestic gas industry and introducing new pricing to encourage domestic gas production. The central government recently announced a subsidy of 0.4 Yuan/cm$^3$ ($1.7$/MMBtu) for shale gas during the period from 2012 to 2015. In the meantime, the central government also proposes to increase the subsidies for CBM production from current 0.2 Yuan/cm$^3$ ($0.8$/MMBtu) to 0.6 Yuan/cm$^3$ ($2.5$/MMBtu) to encourage unconventional gas development in China. However, the timeframe is still not clear. In addition to the subsidies from central government, CBM players also receive 0.1 Yuan/cm$^3$ ($0.4$ MMBtu) from local government, which could be applied for the shale gas players in the future. Moreover, pilot price reforms in Guangdong and Guangxi looks promising to gradually spread to other provinces. The new pricing mechanism will be more market-guided and sellers will have greater flexibility to negotiate directly with gas buyers.
HOW DOES CHINESE UNCONVENTIONAL GAS PRODUCTION AFFECT LNG IMPORTS?

China has been aggressively concluding long-term contracts for supply from Australia, PNG and Qatar over recent years. Overall, China is well covered by its existing LNG contracts in the recent years, and although there is a potential for supply surplus between 2016 and 2018 with new LNG supply from PNG and Australia, this could be absorbed by even stronger LNG demand.

Generally China’s LNG demand forecast has many uncertainties and is sensitive to many factors. For example, there are no obvious economic drivers for gas vs. coal, no overt pressure for environmental driven move to gas from the locals, a lot of uncertainties on pipeline gas import prospects from Russia and potential domestic unconventional gas production. However, in our base case analysis, we forecast shale gas and CBM production in China to be around 70 Bcm in total by 2020, which is around half of what the 12th Five Year Plan has recently announced, due to the challenges of shale gas production mentioned in earlier section. China’s aggressive shale gas production target of 6.5 Bcm by 2015 is unlikely to be met either, but gas imports via pipeline and LNG will likely to be increased to fill in the demand gap, if any, in 2015 through to 2020.

![Unconventional Gas effects on China's LNG demand](image)

With our base case shale gas and CBM production estimates in 2020, we forecast that LNG demand in China will be around 50 MMt/y. However, LNG demand in China could vary considerably by 2020, owing, among other factors, to how much shale gas production it achieves. If China could meet its aggressive shale gas production target of 60 Bcm in 2020 (the government even plans for up to 100 Bcm by), assuming other factors remain constant, then China’s LNG demand could drop by about half of the government target to 26 MMt/y in 2020. On the other hand, due to many challenges associated with shale gas development in China, if the country’s shale gas development underperforms, and could only manage to produce half of our base case (or 30% of the 12th year plan target) at 17.5 Bcm/y by 2020, then China’s LNG demand could surge to 78 MMt/y in 2020. Therefore, it appears that for China to constrain the amount of LNG import volume to around 50 MMt/y by 2020, which is just about below the total capacity of existing and under constructed terminals, it needs to at least meet half of the government’s ambitious target by 2020. Overall, the government’s LNG demand forecast is similar to our LNG base case forecast. The key difference is the government’s total gas demand forecast is much greater, leading to larger domestic production forecast to match the demand, while we have lower total gas demand forecast in 2020.

In a longer term post 2020, China could become one of the most successful countries outside the US in developing shale gas resources due to the unique combination of aggressive government target, significant gas sources to be monetized, and strong growing domestic demand for natural gas. China’s shale gas
development should become more mature with the hopes of having more infrastructures in place, more pools of contractors and technology providers, and better defined fiscal regime.

**BUT CURRENT RETAIL GAS PRICE STRUCTURE DOES NOT INCENTIVISE LNG IMPORTERS**

The possible significant increase of LNG imports into China during 2015 to 2020 to meet gas demand in case unconventional gas production underperforms, if it were to occur, may be complicated by problems related to the current regulated retail natural gas pricing. Bluntly stated, Chinese buyers are losing money hand over fist on high-priced LNG imports due to the retail gas price, which is kept unnaturally low to maintain inflation rate.

While physical conditions for gas-on-gas markets are emerging in China, the deregulation process to establish liberalized, competitive, transparent and liquid gas market is still at its infancy. In the end of 2011, the Chinese government started a natural gas pricing “pilot” reform in Southern China’s Guangdong and Guangxi Zhuang Autonomous region. This is the first real effort to reform domestic gas prices, and introduce new pricing mechanism, to address the issue of the price mismatch between imported and domestic gas, whereby low domestic gas price compared to the high cost of imported gas causes gas importers to suffer losses.

The goal for this pilot reform is to allow natural gas prices in the two pilot regions to fluctuate along with competing substitute fuels, but at a discount to promote gas use. The government will still set the transmission fee of natural gas pipelines. Natural gas prices will be pegged to fuel oil used in factories and LPG in households using the netback calculation methods, with Shanghai prices of fuel oil and LPG selected as the benchmark prices for Guangdong and Guangxi. However, city-gate price caps have been set in the two regions –2.74 Yuan/m³ ($11.5/MMBtu) in Guangdong and 2.57 Yuan/m³ ($10.8/MMBtu) in Guanxi, taking into account the ex-plant (gas processing plant) prices and pipeline fees. These caps will soften the impact of these new regulations as the price change will be limited. We view that this pilot program is likely to gradually spread to other provinces. The new pricing mechanism will be more market-guided and sellers will have greater flexibility to negotiate directly with buyers. And China eventually aims to liberalize ex-factory gas prices to enhance competition and promote the development of China’s prodigious reserves of unconventional gas including CBM and shale.

In addition, China granted a tax rebate on the valued-added tax on gas imports in mid-2011. Gas and LNG importers are able to receive tax rebate for import prices exceeding the wholesale gas prices for a period of ten years from 2011 to 2020 on a quarterly basis.
Although, reform on gas and electricity prices is one of the major items in China’s 12th Five-Year Plan, and the recent pilot program in Guangdong and Guangxi shows some earnestness of government intent, the fact remains that with the current gas market structure, the three China’s NOCs that dominate the LNG imports into China—CNOOC, Sinopec, and Petrochina—lose over $5/MMBtu on imports of newly contracted LNG into the country.

For illustration purpose, the ex-ship imported LNG price from Qatar in October/November 2012 into China is around $17.9/MMBtu on average. LNG importers, e.g. CNOOC and PetroChina, also need to bear the valued-added tax and regasification cost after they unload a cargo at a terminal in China. However, the average ex-terminal price for spot LNG in China is only around $15.5/MMBtu. Therefore, LNG importers lose around $5/MMBtu including the regasification cost and tax. On the other hand, the retail gas price is regulated by the government, and priced at around $14.5/MMBtu for industrial use and $10.7/MMBtu for residential use in Shanghai. Hence, city gas companies lose about $2 - $6/MMBtu by selling gas to the end-users in Shanghai including the distribution cost. It has been mooted that another way to incentivize LNG imports into China would be to create China’s own pricing benchmark that uses for long term Asian LNG contract, or at least for Chinese long term LNG contract. This could help easing the losses the Chinese LNG buyers would need to bear in an event the oil price increases sharply. But, can the Chinese gas market develop to become similar to, for example, the North American gas market and provide a potential pricing benchmark for Asian gas and LNG markets? We are seeing some signs of regional market reform process taking place in China with potential large domestic production, large pipeline imports, and large LNG imports, but these are still early stages. It is very difficult to estimate whether this would widen in scope, truly result in market driven pricing mechanisms and reach other regions in China. The discussion of creating another Asian pricing benchmark in the region is complex, beyond the scope of this paper—and a long way from happening.
Chinese LNG importers will need to cope with growing LNG demand in the country through to 2020, even if unconventional gas production level reaches the government’s 12th Five Year Plan level. However, they will also need to strategically evaluate how to proceed with the current market structure that makes them constantly incur losses from domestic trades.

**Negotiation for higher price or subsidy:** The importers could negotiate with the government to increase wholesale price, leaving city gas companies and end users to absorb the cost. LNG importers could also simply attempt to negotiate with the government to subsidize the losses the LNG importers incur with regulated downstream gas price. Investment optimization: Another loss mitigation strategy for Chinese LNG importers is to seek optimization across the LNG value chain via good upstream investment strategy, ship sizing strategy, and LNG receiving facilities design strategy.

Although value chain optimization should be done for Chinese NOCs LNG investments, these sorts of savings do not really address the subsidy problem as the savings under the best scenarios will only offset a small percentage of the losses.

**Upstream investment strategy:** a potentially more significant means of mitigation is clearly under way as CNOOC, Sinopec, and PetroChina have already been aggressively acquiring LNG assets globally. This would help balancing the loss of the high LNG imported price and low end-user gas price via the LNG importers themselves gain benefits from selling LNG molecules. However, to achieve any significant benefit from investment at the top end of the value chain Chinese NOCs should position themselves in low-cost LNG opportunities, which currently seem most likely to be in the US and East Africa. Chinese companies have no position in these potential LNG export ventures, as buyers or otherwise. Moreover, in terms of acquisition and market optimization, any Chinese NOC efforts to acquire new SPAs are subject to and hamstrung by—the government’s three requirements: Chinese built ships, low LNG pricing, and upstream equity participation. As a result, acquisition and market optimization could be real challenging for the Chinese NOCs to achieve under these conditions. And then there is politics – Chinese companies may be blocked from acquiring large US companies, and may face even tougher challenges in developing a project to export gas outside the US.

In view of these considerations maybe best example of how they are trying to mitigate their losses, and in general, position themselves strategically, in Western Canada, viz. the Nexen acquisition and LNG export development in Canada. In Canada, the Chinese NOCs have had the possibility of obtaining reasonably priced LNG while simultaneously developing shale gas development capabilities — thereby converting the
tension between shale and LNG within China to a complementary opposition outside of China, in the best tradition of Yin and Yang philosophy.

Another important aspect that the Chinese importers need to deeply evaluate is the economic rationale for expansion of existing terminals vs. new receiving facilities. Although it may be obvious that increasing utilization rates and terminal expansion would result in better economic evaluation compared to building a new LNG receiving terminal, in reality we are seeing 15 planned new terminals with the total capacity of 41.5 MMt/y in China post 2015 period. This is in addition to the 9 terminals under construction with total additional capacity of 26.2 MMt/y by 2015. So, if all over the 15 planned terminals come online as planned in 2020, China would have 32 LNG terminals in total with total capacity of 94 MMt/y, which is even greater than our high case LNG demand of 78 MMt/y in 2020. It would appear to be justified only under the high case LNG demand scenario.

China could prepare for the high case LNG demand with lower number of new proposed terminal by improving utilization rates of all LNG terminals, and focus more on expansion of existing and underconstruction projects rather than focusing on developing brand new import terminals. For example, the average utilization rate for all LNG terminals in China is about 70% during 2011-2012. If we increase the efficiency rate from 70% to 90%, the tally of terminals could be reduced to 29 by 2020, which would match the LNG requirement forecast (high LNG demand case mentioned earlier on our LNG demand scenario analysis). Expansion and tighter capacity management could further achieve a significant reduction in the number of new planned terminals for the emerging demand by 2020. Project execution times for expansions tend to be relatively short. NOCs would have ample time to assess import terminal requirements and execute the more marginal terminal projects, if required, as more definite shale gas production forecasts for the 2020 period emerge. Such a rigorous view of infrastructure investments, however, seems inconsistent with the current mindset of government or NOCs.

Focusing on utilization rate improvement and expanding the terminals would not only save significant capital investment and infrastructures, but also help improving the economics of the existing and underconstruction projects by realizing economic of scale and shared infrastructures. New terminals would have more strategic rationale if they were to be located in other isolated areas for strategic reasons, and local jobs creation. However, those 15 planned terminals are all going to be located along the coasts, not that distant from the existing and underconstruction projects.

Transfer losses to the government: Players along the value chain could share the losses among themselves and this is the current situation in China. As demonstrated previously, LNG importers loss around $5/MMBtu by selling LNG to city gas companies, who also losses $2 - $6/MMBtu by selling regasified LNG to end-users. As most players in the gas industry are state-owned companies, they are able to transfer the losses to the government by taking more government subsidies. However, this does not work efficiently and will dampen the market competition as the losses here will prevent new companies from entering into the gas market, and discourage the existing companies to further invest in their gas business. In practice all three strategies are likely to be pursued, with varying levels of success.

CONCLUSION

The likelihood that absolute volumes LNG imports will be reduced by 2020 due to unconventional gas production is unlikely as China will continue to grow, so requiring significant amount of LNG imports to sustain the growth. Even if China could produce CBM and shale gas at the government’s target level, Poten estimates that LNG import growth would still continue from the current level to 18 MMt/y in 2015, then at slightly lower rates, to reach around 26 MMt/y in 2020. In our base case, when shale gas and CBM production level should only be around 50% and 65% of the current 12th Five Year Plan production target, we view that LNG import is likely to reach 27 MMt/y in 2015 and goes up to 50 MMt/y in 2020, On the other
hand, if China cannot mitigate challenges associated with shale gas development such as gaining better understanding of each shale play characteristics, land acquisition, pipeline infrastructure development, securing sufficient water resources, enhancing attractive fiscal regime, and creating extensive local manufacturers and contractor community, the LNG import could even rise higher to 78 MMT/y in 2020 with shale gas production of around 17 Bcm or 30% of the level set by the government in 2020, which in our view is a high demand forecast for LNG imports into China.

Unconventional gas production levels pre-2020 are unlikely to be sufficient to alter the government plan on aggressively supporting the national oil companies to acquire LNG assets around the world. However, strong LNG demand would put pressure on the government to further evaluate appropriate downstream pricing mechanisms in order to sustain the LNG importing business, especially if unconventional gas production underperforms. This is because the current LNG importers in the country would likely to continue making losses on LNG imports into China without government subsidy due to low regulated end-user gas pricing.

At a ground level, Chinese LNG importers need to develop sophisticated strategies to reduce losses on their LNG business segments, with strategies including negotiation for higher wholesale prices, negotiation with government for direct subsidies on LNG import losses, and investment optimization strategy across the value chain. Chinese LNG importers need to also immediately evaluate the benefits of improving efficiency of their expanding terminal portfolios, with likely focus on expansion projects rather than constructing brand new LNG projects where feasible.