

February 2021

China's Natural Gas Development Report: A Tale of Two Years

Introduction

China released its Natural Gas Development Report (NGDR) in late 2020. The document reviews developments in the country's gas sector in 2019 and the first half of 2020 - as well as the global gas industry context which affects China – and sets out plans for 2020-2021. This is now the fifth edition of the annual NGDR, produced jointly by the National Energy Administration and the Development Research Centre (under the State Council) with inputs from the national oil companies.

If the 2019 report majored on the seemingly inexorable rise of Chinese gas demand, the major theme underlying the 2020 NGDR has been the impact of Covid-19. While China was the first major economy to be affected by the virus and responded to it with a series of aggressive lockdowns which sharply reduced energy demand, the economy has since recovered and was the only major economy to show growth in 2020 – expanding by 2.3%.

In 2019, the focus in the global gas industry was on the continuing rise of Chinese gas demand on the back of a combination of economic growth and the ongoing switch from coal to gas. Linked to this were expectations of a growing demand for LNG and a consequent impact on global gas markets. While 2020 started off with a slump in activity, China emerged once again as a bright spot for the international market.

The 2019 NGDR assessed the challenges facing the industry in China – price reform and market liberalisation among them – in the context of supply security concerns beginning to come to the fore and linked to the US-China trade war.

Many of the themes from 2019 have carried over into the 2020 NGDR, which was written before President Xi Jinping's pledge that China would be carbon neutral by 2060. Given that 2020 was also the final year of the 2016-2020 Five-Year Plan and the 2021-2025 FYP is currently being drafted, the 2020 NGDR can only provide limited visibility into the implications of the carbon neutrality pledge on short term gas market developments.

In this paper we look at this recent history as well as China's gas sector response to Covid-19 and the country's ambitions for the sector going forward. In addition to appearing in the final year of the current FYP, we should remember that, while the NGDR is an important statement of the government's ambitions, it is not a binding document but rather a framework for thinking about the future development of the gas sector. With the NOCs involved in the preparation of this document and the debate around China's gas sector, there are unlikely to be any surprises for them in its conclusions.

We start with a commentary on the government’s assessment of the global gas market and China’s operational position within it for the last full year. We then review the progress of reform initiatives in the gas market – from upstream licensing to infrastructure access to pricing.

China in the global gas sector context

Commentary in the NGDR

The Natural Gas Development Report (2020) summarises China’s position in the global gas industry. While familiar to many, it is a useful reminder of how China currently views itself in terms of its interrelationship with the world market for gas.

The NGDR quotes a series of statistics to illustrate its points, which we summarise in the table below. Despite Chinese production rising more in percentage terms than consumption, imports grew by more than 9% in 2019 since consumption was 70% higher than gas production in 2019. Globally the NGDR noted a shift in trade towards LNG and away from pipeline gas, although the latter remained dominant globally at 62% of traded gas volumes.

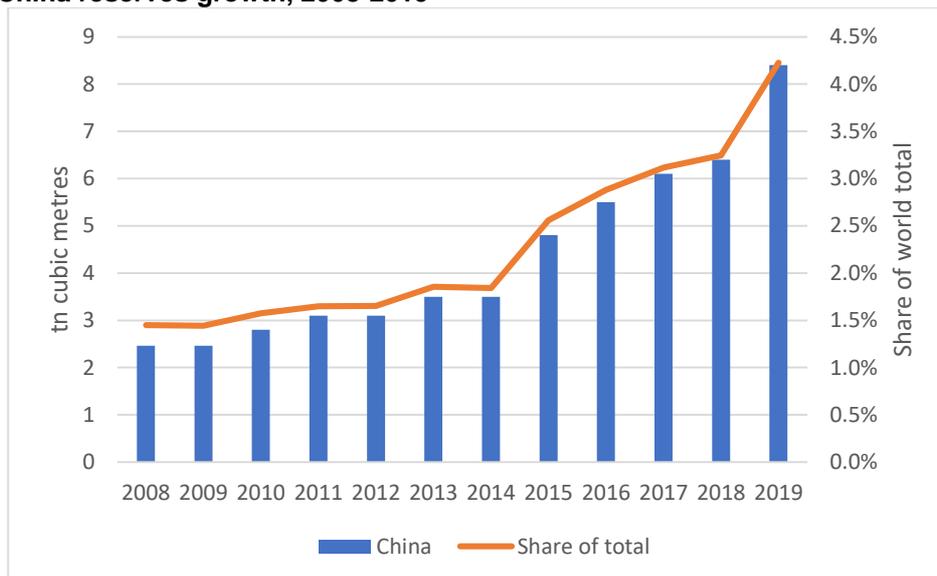
Table 1: Summary statistics

2019 change (%)	China	Global
Fundamentals		
Reserves		0.9%
Production	9.9%	
Consumption	8.6%	
Imports		
Imports	9.2%	
Trade - Total		4.1%
Trade - LNG		12.7%
Trade - Pipeline		-0.5%
Prices		
JKM		-44.0%
Henry Hub		-20.0%
UK NBP		-45.0%

Source: NGDR (2020)

China's relative position

Figure 1: China reserves growth, 2008-2019

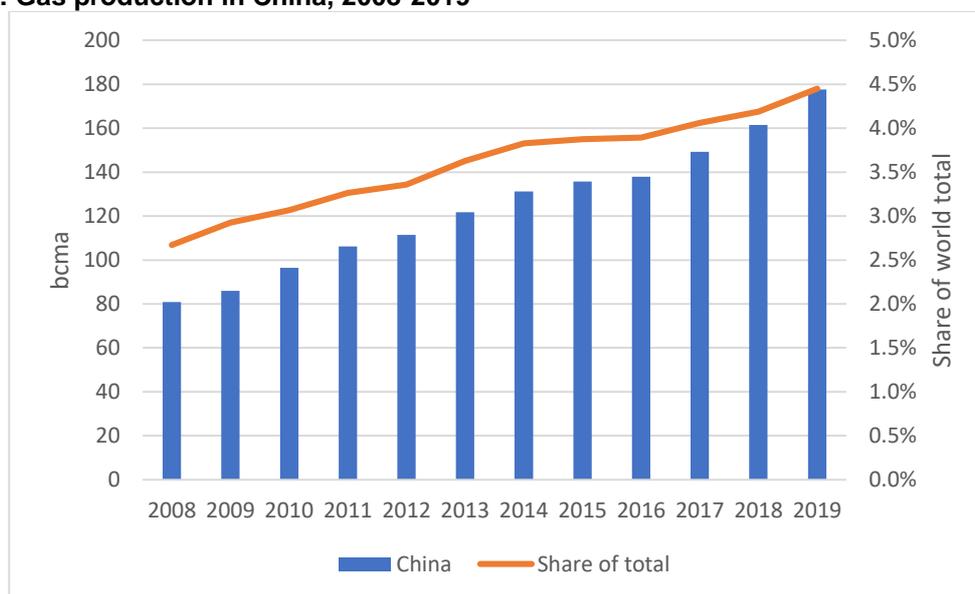


Source: BP Statistical Review of World Energy, 2020

If we look at China on a relative basis over the past ten years or so, certainly in the second half of the last decade there has been a significant pickup in the pace of reserves growth. China's reserves now represent 4% of the world's total against just 2% five years ago. These growing reserves should underpin rising production in the years ahead and contribute to greater security of supply

Shale gas developments have also continued in a number of areas in the Sichuan Basin. More than half of the increase in geological reserves is conventional gas with the balance being shale gas discoveries. In terms of technically recoverable reserves, almost two-thirds are conventional gas and one-third shale gas.

Figure 2: Gas production in China, 2008-2019

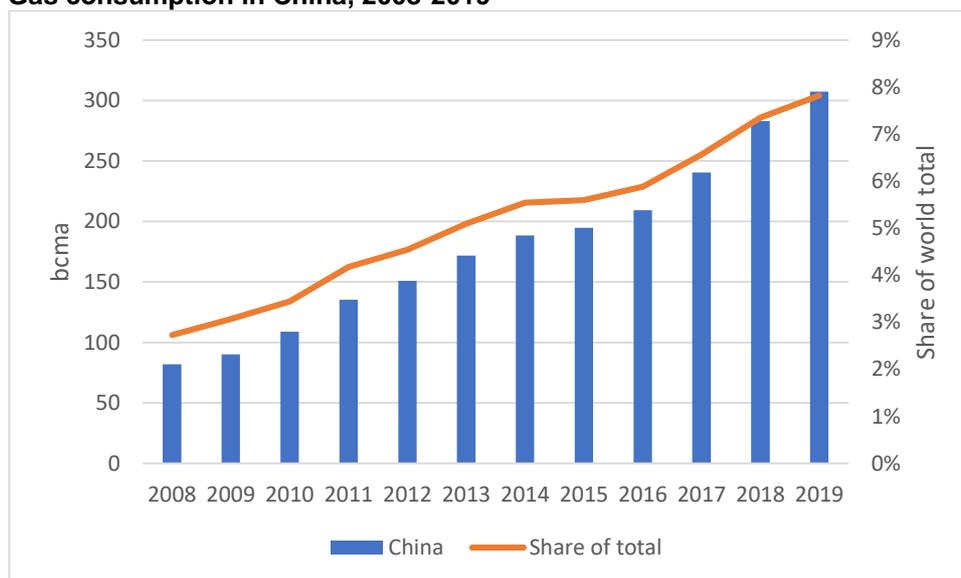


Source: BP Statistical Review of World Energy, 2020; Natural Gas Development Report (2020)

While gas production grew by 9.9% in 2019, 86% of that production was conventional gas, 9% shale gas and the balance a combination of coalbed methane and coal gas production.

On a global scale China's production rose from 3% of global output in 2008 to 4.5% in 2019. Despite this, with consumption climbing more rapidly in recent years, supply security concerns have been growing as the country's import dependency has steadily risen.

Figure 3: Gas consumption in China, 2008-2019



Source: BP Statistical Review of World Energy, 2020; Natural Gas Development Report (2020)

Gas demand continued to rise, albeit at a slower rate than in previous years. The 2019 NGDR suggested that demand growth that year would be around 10% after the very strong 2018 growth of 17.7%. In reality the slowdown in demand growth was even greater than suggested by the 2019 report, with consumption rising by just 8.6%¹. Nonetheless, by the end of 2019, gas represented 8.1% of total energy consumption, up from 7.8% in 2018 and getting closer to the government's target range of 8.3-10% by 2020.

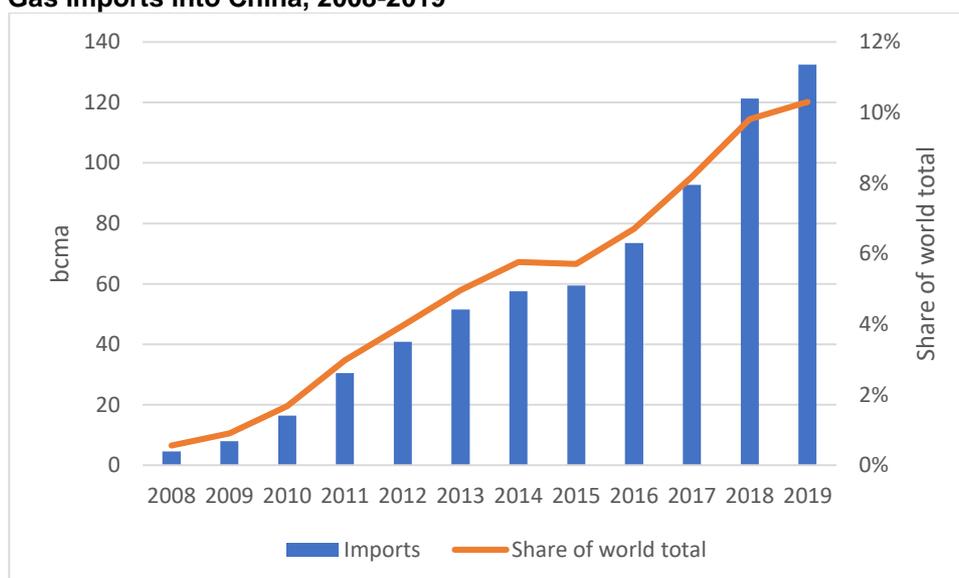
City gas and industrial gas use accounted for almost three-quarters of total gas use in 2019. Demand for gas in the chemical industry rose but gas use in power generation actually declined – which is a disappointing outcome and suggests that the concerns of some analysts that, firstly, gas is too expensive a fuel for use in power generation may well be justified and, secondly, that the willingness to replace coal with gas in power generation is waning.

As noted earlier, China's gas consumption growth has outstripped both its reserves and production growth and led to consistently higher import volumes. Reflecting this rate of growth China now accounts for 8% of global gas demand compared to just 3% a decade ago.

¹ BP Statistical Review of World Energy, 2020 – p36

<https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>

Figure 4: Gas imports into China, 2008-2019



Source: BP Statistical Review of World Energy, 2020; Natural Gas Development Report (2020)

Import volumes have climbed steadily over the last decade as demand has risen. They only began in 2006 but now represent some 10% of total world trade, with almost two-thirds accounted for by imports of LNG. The sharp rises in recent years have started to cause concern in Beijing about supply security.

Imports continued to rise steadily in 2019 and the range of import sources diversified further according to the NGDR – which is true, although with nineteen suppliers in 2018 and twenty in 2019 the increase in diversification was limited. China imported 132.5 bcm² of gas in 2019, with the majority (64%) arriving as LNG from those twenty suppliers. However, while the volume of spot LNG in the import mix grew further, from 25 bcm in 2018³ to 29 bcm in 2019⁴, spot LNG remained around 34-35% of total Chinese LNG purchases. China was the world’s largest gas importer overall in 2019.

The NGDR does note that the number of companies and organisations importing LNG expanded over 2019, although in reality their impact is relatively small, certainly when compared with the three major NOCs. In 2019 importers other than the NOCs were responsible for just 7.3% of China’s LNG imports⁵ although their share is set to rise in the future; reportedly, both NOCs and independents are hurrying to construct new import terminals as the establishment of PipeChina is set to create new opportunities for private buyers and because the utilisation rates of existing plants have been quite high. Moreover, many of China’s coastal provinces are supportive of having their own import terminal⁶.

Infrastructure

Further investments were made in additional pipeline capacity and storage facilities and the report notes that gas supplies are now effectively guaranteed, even in times of peak demand such as the winter months which have been a problem in the past, most significantly in the 2017-18 winter when there were widespread shortages. China’s main pipeline network consisted at the end of 2019 of 87,000 km

² BP Statistical Review of World Energy, 2020 p43 & 44 <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>

³ <https://www.gti.energy/wp-content/uploads/2019/10/05-LNG19-02April2019-Feng-Chenyue-paper.pdf>

⁴ China Natural Gas Development Report (2020) – p8

⁵ China Natural Gas Development Report (2020) – p8

⁶ World Gas Intelligence, 24 June 2020 http://www.energyintel.com/pages/eig_article.aspx?DocId=1076033&NLID=10

of long-distance pipelines with a transmission capacity of 350 bcma, against demand of around 307 bcma. And while China had ample supplies of natural gas in the winter of 2019-20, the following winter saw severe shortages, in part due to the lack of adequate incentives for companies to invest in storage.

The lack of storage capacity for gas in China has frequently caused problems in the winter period given that storage has for some time been much lower as a proportion of gas demand than is found in other countries with developed gas markets. The government has long pressed for companies and municipalities to resolve the issue by building more storage. By the end of 2019 the NGDR notes that there were 27⁷ underground gas storage facilities operating with capacity of 10.2 bcm, a 42% increase from the 2018 level. The NGDR highlights that the location of storage facilities has been optimised, areas with rapid demand growth have been prioritised for additional storage infrastructure and the pricing mechanism has been adjusted to encourage investment. Although in reality, despite these optimistic statements, storage remains a big concern and major challenge. The 2020 target of 14 bcma of capacity has been achieved but local government and township storage levels remain low and there is still considerable debate about how to incentivize storage. PipeChina has some assets that it hopes to optimize but local level incentives are still problematic.

Progress on reform in the gas market in 2019

The government's plans for reform of China's gas market, which have been underway for a number of years, continued in 2019 with progress in the upstream, midstream and downstream segments of the industry. The midstream reform through the creation of PipeChina is certainly the most significant change to take place in recent years.

Upstream

In the upstream segment three major government policy statements were released – two focused on reforming upstream property rights⁸, one on reforming the government's management of reserves⁹ and one on financial incentives for unconventional gas output¹⁰.

The reform of upstream property rights included the introduction of social funds to carry out oil and gas exploration and development, tighter restrictions on companies withdrawing from blocks, a focus on increasing enterprises' exploration and development activities and an increase in the amount of time a company has to exploit a discovery. In the middle of 2019 restrictions on foreign companies investing in oil and gas exploration and development were loosened and the requirement to partner with a local company was abolished.

In terms of encouraging greater investment in the exploration and development of unconventional gas (coalbed methane, shale gas and tight gas), additional funds were made available. Those enterprises exceeding previous production levels – particularly in the winter months - were to be awarded additional funds, while those falling short were to have their funding reduced as a penalty for the underperformance.

Overall, there is as yet no evidence to show that these have encouraged greater investment in the upstream by foreign oil companies. One factor behind this muted interest in the Chinese upstream is clearly the collapse in oil prices in 2020 which will have generally discouraged international oil companies from taking investment decisions given their challenged financials. In addition, the

⁷ China Natural Gas Development Report (2020) – p9

⁸ Guiding opinions on promoting the reform of the property rights system of natural resources assets in a comprehensive manner & Special administrative measures for foreign investment access (negative list) (2019)

⁹ Opinions on promoting the reform of the management of ministry resources (trial)

¹⁰ Supplementary notice on the "temporary measures on the management of special funds for renewable energy development"

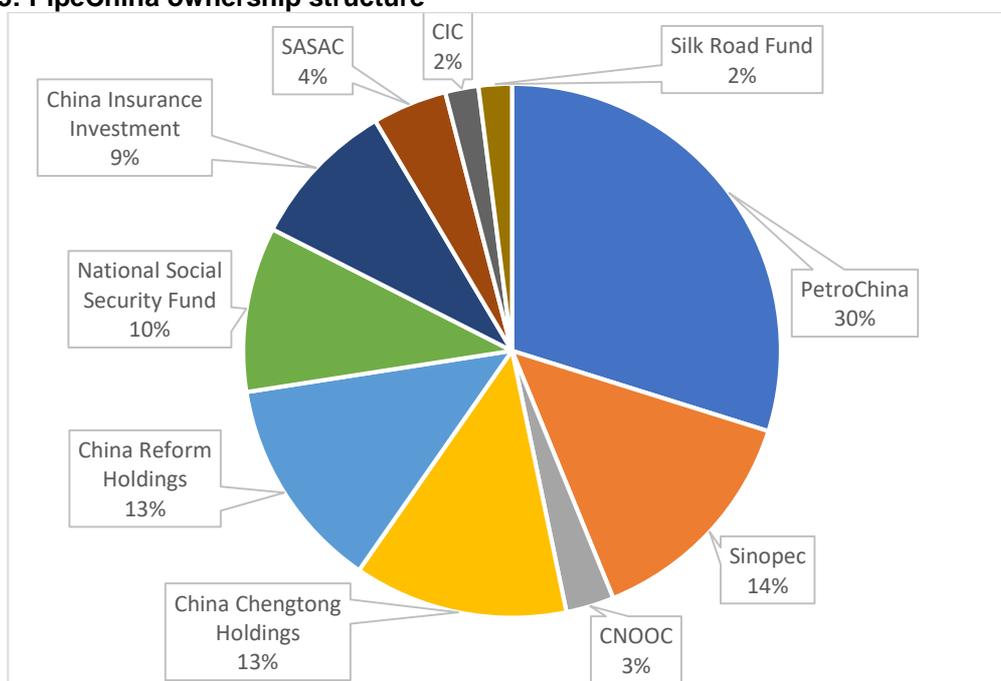
international companies still likely consider that the best acreage is controlled by the Chinese companies and any change in that position is only going to happen in the long-term.

Midstream

There was major progress on the reform of the midstream sector, with the implementation of three important decrees¹¹ – although it was not until September 2020 that the institutional framework was formally created with the establishment of the China Oil & Gas Piping Network Corporation (PipeChina). The overall aim of midstream reform was to, as the NGDR states, “establish a national oil and gas pipeline network company and promote the construction of a nationwide network”.

The oil and gas pipeline company was established with a large state sector ownership stake but also individual ownership stakes by the three major NOCs and other entities.

Figure 5: PipeChina ownership structure



Source: Argus Media, 24 July 2020

One of the key issues for the pipeline company going forward – which the NGDR does not speak to in any detail – is who will be the regulator and what regulatory framework will it be in charge of monitoring. Most likely, further details will appear in the forthcoming Five-Year Plans. Nevertheless, the NGDR does make clear that a major objective is the fair opening of China’s midstream infrastructure to third parties, which has been one of the major obstacles to increasing competition in the country’s gas market. The document also references an acceleration in pipeline construction and in the number of interconnections as well as greater efficiency in the operation of the network, which we take to mean reducing the costs of the pipeline network to enable gas prices to end-users to be lowered, thereby encouraging both economic growth and increased demand for gas.

Downstream

Reforms in the downstream market are also important in the 2020 NGDR, which sets out three objectives underlying them:

¹¹ Opinions on deepening the reform of the oil and natural gas system, Implementation opinions on the reform of oil and gas pipeline network operating mechanism & Measures for the fair opening of oil and gas pipeline network facilities.

- Promoting the use of natural gas in power generation
- Accelerating the development of gas use in the transport sector
- Contributing to the prevention and control of air pollution.

By the end of 2019 progress was being made on the first objective, with installed gas-fired power generating capacity of 90 GW. According to the IEA, gas represented 3% of China's generating capacity at the end of 2019¹². However, at the same time nuclear was 5%, renewables 23% and coal 69% so gas is still a very small proportion of China's power generating capacity.

The Chinese government has also mandated sulphur content restrictions on marine fuel in the transport sector which has increased the use of low sulphur fuel oil. At the end of 2019 an additional regulation was put in place to encourage the use of LNG in ships and in heavy-duty trucks.

The NGDR stresses that some benefits of the reform process are already evident. In 2019 the VAT rate on natural gas was cut from 10% to 9% and as a result the price of natural gas to end-users had fallen. The document also references the government's decision in early 2020 to bring forward the beginning of the summer gas price period (typically 15-20% lower than the winter price) from the end of March to the middle of February, thus reducing costs to end-users, in large part as a response to the Covid-19 induced economic shock.

A preliminary assessment of 2020

There is no getting away from the fact that, while 2019 was the year of gas demand growth in China, 2020 was the year of coronavirus and all that meant for economic activity, energy demand and dislocation across the world. The NGDR admits that the outbreak had a significant impact on both China's economy and its energy development.

1H 2020 Outturn

The rate of increase in gas demand fell significantly in the first half compared to the year before totals – but the outturn was still a positive one, with demand rising by 1.5% in the first half of 2020, a remarkable result given the disruption caused not only in China but also across the world.

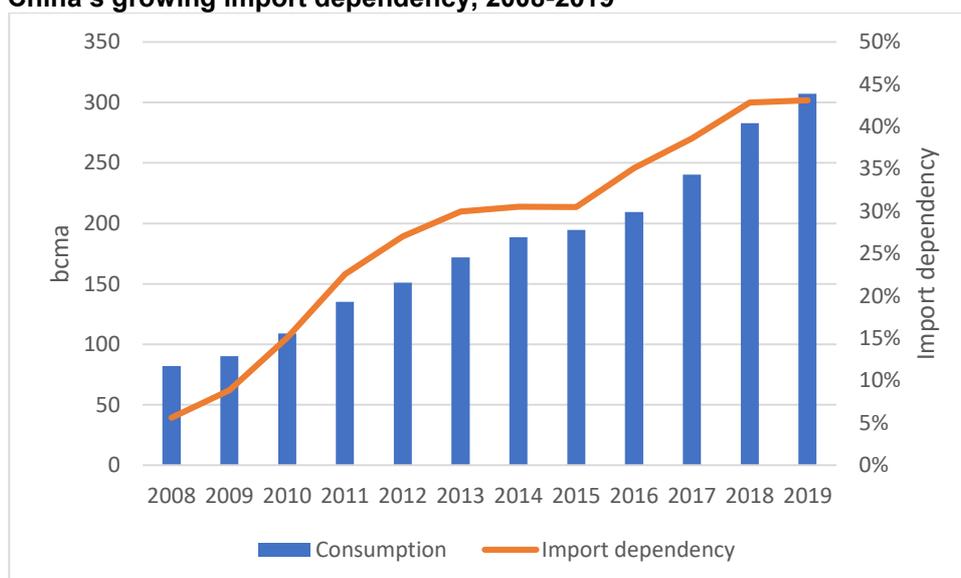
Reflecting the growing concern about the issue in Beijing, the NGDR confirms that China's energy security was tested during the virus outbreak. The 1.5% year-on-year increase in gas consumption was despite each of the first two quarters' economic growth being negative and the NGDR cites lower domestic and international prices as the key determinant of gas demand growth in the period. It does seem as if there was pressure on the NOCs to restrain prices to end users to encourage demand and help the economy recover from the Covid pandemic.¹³

¹² International Energy Agency "Global Energy Review, 2020"

<https://www.iea.org/data-and-statistics/charts/electricity-mix-in-china-q1-2020>

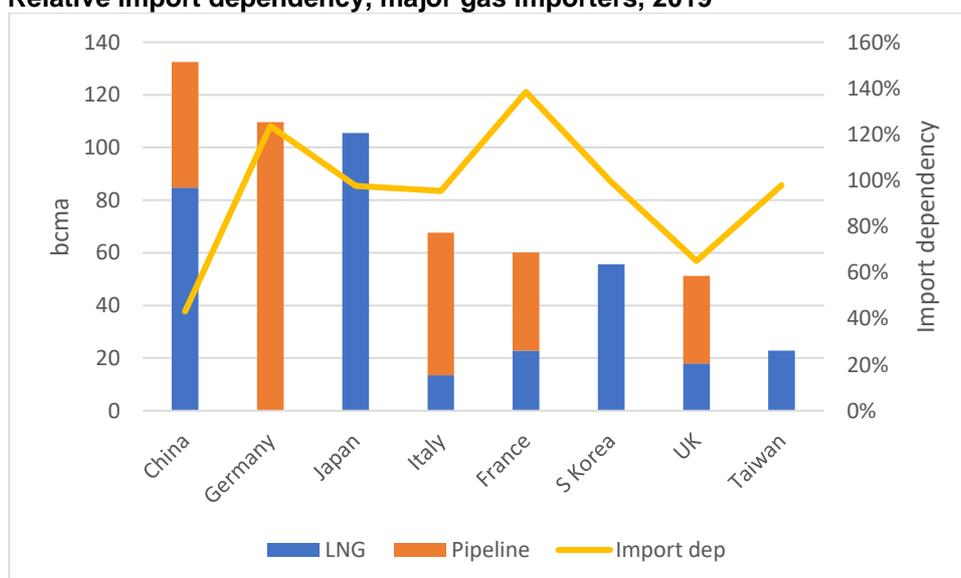
¹³ World Gas Intelligence, 15 April 2020 http://www.energyintel.com/pages/eig_article.aspx?DocId=1069461&NLID=10

Figure 6: China's growing import dependency, 2008-2019



Source: BP Statistical Review of World Energy, 2020; Natural Gas Development Report (2020)

Figure 7: Relative import dependency, major gas importers, 2019



Source: BP Statistical Review of World Energy, 2020

China is currently the world's largest importer of natural gas and the second-largest importer of LNG. In terms of supply security, LNG is more at risk from external threats than pipeline gas. LNG cargoes typically traverse a number of seas to reach China while volumes from suppliers like the Central Asian countries, Russia and Myanmar are probably more secure in Beijing's mind since they are delivered by pipeline – although price can play an important role in the short-term. In the first quarter of 2020 PetroChina deferred significant volumes of gas from Central Asia (and total pipeline volumes in the first half of 2020 fell by 7.4% but volumes from Central Asia fell by 17%) because of Covid¹⁴. LNG imports

¹⁴ World Gas Intelligence, 21 October 2020 "China pivots to Russia as US tensions mount". https://www.energyintel.com/pages/eig_article.aspx?DocId=1087158

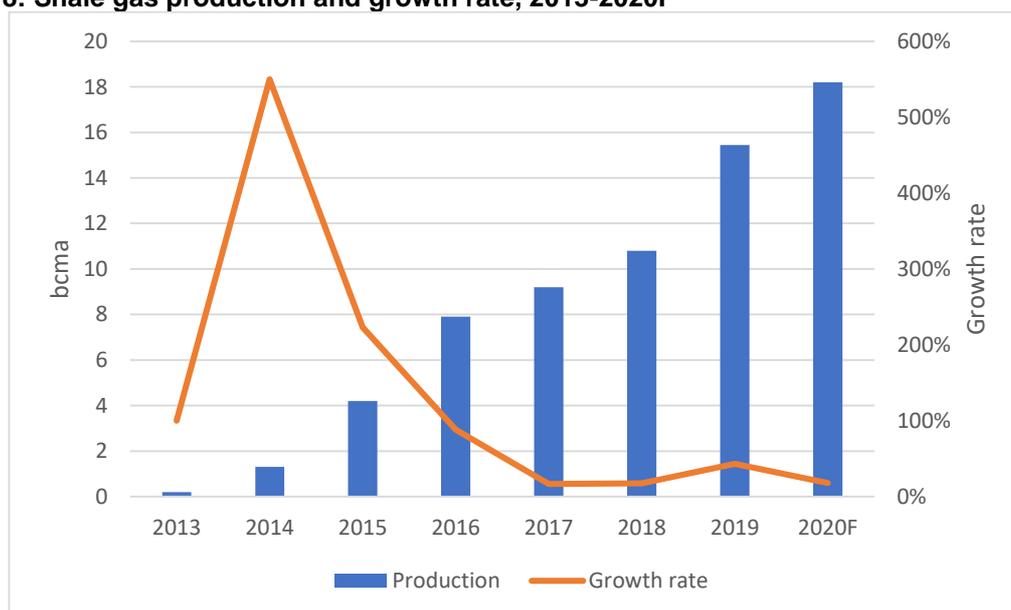
– which had fallen sharply in price - were up 10% over the same period. It is quite likely that PetroChina will have needed to take the deferred Central Asian volumes in late 2020/early 2021 because the pricing formula – which takes longer to pass through the lower oil prices - is now generating low prices for Central Asian gas.

Diversity, nevertheless, is an important element of energy security - and with 20 LNG suppliers and 5 pipeline gas suppliers, China could be seen as relatively secure on some measures – although Beijing’s increasing focus on supply security suggests that the government does not entirely share that view. Imports represented 43% of consumption in 2019 and will likely have risen only slightly to 44% in 2020 so in comparison with other large importers such as Japan (100% import dependent), Taiwan (100%) and Italy (95%) China is, at first sight, relatively well-placed. Germany and France are also heavily dependent on imports, although their abnormally high import dependence in the chart above reflects the substantial intra-European gas transit volumes crossing their territory.

The NGDR highlights a series of achievements and future measures which together might be said to contribute to greater supply security. These include significantly increased domestic reserves, higher production, subsidies to stimulate production growth, a more diverse range of gas suppliers, more companies importing gas and doing so through a wider range of routes. Overall, reading the NGDR suggests that the government is clearly aware of the tendency towards greater import dependency and is taking steps to address this through greater domestic output while accepting that, if imports are going to rise, the aim should be to secure a more diverse range of import options.

Despite the pandemic, gas exploration continued and production growth in the first half of 2020 was surprisingly strong at 10.3% year-on-year, with conventional gas output growing at 8% and representing 88% of output. Shale represented less than 10% of output but production climbed by 35%, suggesting that the government’s focus on stimulating unconventional gas production is having a positive impact. The NGDR forecasts that annual gas production will grow by 9% to reach 189 bcm in 2020 – which it did actually achieve (against 177.6 bcm in 2019¹⁵).

Figure 8: Shale gas production and growth rate, 2013-2020F



Source: Ministry of Natural Resources; Natural Gas Insight; Natural Gas Development Report (2020)

¹⁵ BP Statistical Review of World Energy, 2020, p-26

<https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>

However, according to the National Bureau of Statistics, domestic production reached 173.6 bcm in 2019.

Industrial demand for natural gas was flat overall - after dipping sharply in the first quarter it made a steady recovery during the rest of the first half so that on a cumulative basis consumption had returned to the same level as in the first half of 2019. The recovery was partly due to the government's policy of reducing gas prices for industrial users to stimulate demand.

City gas consumption actually rose by 10% over the first half. Colder weather along with an earlier start to the summer pricing of natural gas in the first quarter and the gradual reopening of the economy in the second were the main reasons behind the increase. This was in contrast to gas demand in the power generating sector which was significantly affected by the pandemic and declined in the first half of the year.

2H 2020 Assessment

The NGDR acknowledges that the gas sector is facing ongoing challenges from the Covid pandemic. Nevertheless, it adopts a relatively optimistic tone when discussing the future of the sector – highlighting China's ability to grow both reserves and production, along with relatively low international gas prices and the institutional reforms that are being adopted across the domestic gas sector to improve efficiency and bring down costs, particularly in the midstream. It suggests that, in the light of all these changes, the future development of the gas sector could move more quickly than might otherwise have been the case.

In practical terms the NGDR forecast China's gas consumption to be 320 bcm in 2020¹⁶, an increase of 13 bcm against the 2019 total. Domestic production, too, was forecast to increase – to 189 bcm (an increase of 9% against the 2019 level). Imports were forecast to remain at very similar levels to those seen in 2019 – which is slightly surprising given the evidently rising concern about energy supply security in Beijing, although the absolute level of gas imports and the routes by which they arrive in China cannot be changed overnight. LNG imports at the end of 2020 reached 89 bcm, a year-on-year increase of 11 bcm (14%) which is higher than the 2019 increment. Pipeline flows ended the year at 45 bcm, a year-on-year decline of 1.2 bcm (3%).

Looking further ahead, production growth is likely to be focused on four areas:

- Sichuan, where plans include the development of a “dual enrichment” production base there to stimulate production increases in both conventional and unconventional gas
- Ordos Basin – here the plans include the development of a tight gas production base with the aim of increasing production by a greater intensity of tight gas development
- Xinjiang, where a “deep gas” production base is proposed to develop deep and ultra-deep gas reservoirs in areas such as the Tarim Basin
- Offshore areas, where a deepwater gas production base is planned for the Bohai Sea, the East China Sea and the northern reaches of the South China Sea.

The NGDR also highlights one of the major reforms currently underway – the creation of a national oil and gas pipeline company. As part of the reforms, the government plans to speed up the construction of both pipeline networks and gas storage facilities as well as encourage the development of more coastal LNG import terminals. The commissioning of a new gas pipeline running north-south (the Qingning gas transmission pipeline) will improve China's ability to move gas around the country to areas where demand is peaking.

The 14th Five Year Plan also gets a mention since that comes into operation from March this year and covers the period 2021-2025. The main, fairly concrete, ideas that the NGDR highlights include:

¹⁶ Implied demand (net imports and domestic production) reached 322 bcm according to the National Bureau of Statistics and China Customs data.

- Further development of the national pipeline network to meet the needs of the country
- Opening up the pipeline network to third parties and improving its efficiency
- Continuing reforms of the oil and gas system in areas such as the licencing regime for reserves and the operating regime for the new pipeline company – both with the aim of creating an efficient natural gas market in China
- The new Five-Year Plan is also likely to include the establishment of a regulator, the finalisation of the regulatory framework, greater interconnections between pipelines and more pricing deregulation¹⁷.

Our Assessment of the NGDR

Energy Law

In terms of activities on the ground, there has long been discussion of an energy law which would provide both incentives and penalties to move gas sector reform along. However, progress on its development has been slow. Consultations have been going on for over a decade, the first draft of the law was produced in December 2007 while the second draft emerged for consultations in April 2020. Perhaps the major concern about the draft law is that there are no consequences set out for those companies which break the new law, meaning that its impact is likely to be limited if it gets passed in its current form. However, the draft law does explicitly reference supply security, reflecting the attention that Beijing is now paying to the topic.

Creation of PipeChina

The planned creation of the China Oil & Gas Pipeline Network Corp (“PipeChina”) was announced in December 2019 and the company formally came into existence at the end of September 2020 when a range of NOC infrastructure assets were transferred to the company. So, in the field of midstream reform at least, there has certainly been progress. However, future challenges include appointing an organisation as the regulator (which seems likely to be the National Energy Administration) and establishing a code of conduct under which PipeChina will operate and from which detailed regulations impacting important issues such as third party access to pipelines and terminals, gas storage construction etc will derive with one of the key aims being an efficient and effective gas transportation system that avoids the gas shortages that have occurred in some previous winters.

If the example of other countries where infrastructure companies have been established on the basis of both the assets and the management of existing companies in the sector is anything to go by, it will take some considerable time – and likely further management changes – to ensure that the new infrastructure company will operate as a service provider to third parties on an equal basis without overtly or covertly advancing the interests of its major shareholders, which include all of China’s NOCs.

The creation of PipeChina is a very important development and over time will certainly have a positive effect – but in the short-term, given that it will take time to put in place all the necessary processes etc, we should not be too optimistic about the impact. In addition, local governments are divided on the benefits of greater competition and lower prices. Coastal provinces, with access to seaborne LNG imports are the most enthusiastic because they see the benefits of competition and the lower gas prices that it might bring. Inland provinces, where alternative import options are limited and where local governments often hold stakes in the local distribution companies, are less enthusiastic about the possibilities.

¹⁷ Reform is in the pipelines: PipeChina and the restructuring of China’s natural gas market, Erica Downs and Sheng Yan, Center on Global Energy Policy <https://www.energypolicy.columbia.edu/research/commentary/reform-pipelines-pipechina-and-restructuring-china-s-natural-gas-market>

In June last year there were reports that Chinese LNG importers had lost patience with the creation of PipeChina and were pressing ahead with a multitude of plans for new import terminals to enhance their competitiveness in the domestic gas market¹⁸. There have been examples of LNG import terminals allowing their shareholders – but not third parties - to import cargoes through their facilities. CNOOC was also willing to allow this but required companies using its import terminals to buy some of its expensive term LNG as part of the deal. CNPC and Sinopec have typically been very reluctant to open up their facilities to third parties unless instructed to do so by the government.

The simple fact of the establishment of PipeChina has also prompted the NOCs to get moving on constructing additional gas storage capacity. CNPC said in early 2020 that it had plans to construct 23 new storage facilities and that 6 of them will be completed before 2025. The government had set a target that the NOCs' gas storage capacity should represent 10% of gas sales by 2020, that of gas distributors should represent 5% of sales and local authorities should have three days of consumption in storage. However, the NEA has said that progress towards these targets has been slow, particularly by gas distributors and local authorities.

Pricing

The topic of gas pricing reform in China is certainly less high-profile than it has been in previous years or than areas such as midstream reform or supply security currently are. Nevertheless, there are changes taking place that move in the right direction. Previous government changes to the pricing regime – while also moving in the right direction – have happened in fits and starts and their timing has been unpredictable.

One of the aims of gas price deregulation has always been to reduce gas prices to end users to both stimulate economic growth and encourage the use of gas rather than coal. The central government did tell the NOCs to bring forward summer gas tariffs (typically 15-20% lower than winter tariffs) from mid-March to early February in the 2019/20 winter.

A number of provincial governments – primarily in the eastern coastal provinces – have announced policies aimed at bringing down the cost of gas to end users. They will allow the NOCs to sell directly to end users, rather than through local gas distribution companies to lower prices and stimulate economic growth. At the same time, those local gas distributors have ambitions to become independent LNG importers to secure cheaper supplies and, once again, bring prices down to stimulate gas demand. However, access to import terminals, long-distance pipelines and provincial pipelines is essential for both of these developments and that is generally only starting to be put in place through the creation of PipeChina. Hence while these initiatives are positive, given the constraints they are going to take a while to have an impact.

In a move that ties in with those from the provincial government, in March 2020 the NDRC announced that the prices of many different types of gas – including the new Russian pipeline gas – could be set by direct negotiation between buyers and sellers from the beginning of May 2020. The NDRC did this by removing any mention of price controls from the pricing catalogue, noting that the citygate prices in provinces that have what the NDRC called “a competitive market” will gradually be deregulated – which will enable local governments to experiment with new pricing approaches.

Once again, the aim was to get the economy moving but many of the non-NOCs were sceptical about whether this change would be effective given that, at the time, PipeChina had not yet been established while the NOCs still had a monopoly over their pipelines and were therefore in a position to take advantage of the gas distribution companies.

¹⁸ World Gas Intelligence, 24 June 2020 http://www.energyintel.com/pages/eig_article.aspx?DocId=1076033&NLID=10

Hence, there have been a variety of changes, in the right direction in spirit if not yet in reality, without a single unifying event. We will probably need to wait and see the impact of the establishment of PipeChina before we can make a clear judgment about the effect of further pricing deregulation in China.

Supply security

Supply security has emerged as an important topic for Beijing – for oil as well as gas - with rising import dependency (71% for oil and 43% for gas), falling domestic oil output and growing tensions between China and the US. With these concerns evident in Beijing, domestic production is a priority for the government, and we saw first half gas 2020 output rising by 10.3% against the previous year. It is likely that shale gas production - where China has very substantial reserves – will receive greater political priority despite its challenged profitability in China. Gas production looked to be increasing steadily over 2020 on the back of government instructions to reduce reliance on imports.

Natural gas demand in China started off lower than market expectations in 2020 - although it steadily recovered over the course of 2020 from its low point in the first quarter. Despite Beijing's concerns about supply security, a combination of market liberalisation and low gas prices led to encouraging a higher volume of LNG imports.

Looking further out, Xi Jinping's surprise announcement in September that he wanted China's emissions to peak by 2030 and the country to become carbon neutral by 2060 means that previous assumptions about the trajectory of Chinese gas demand may need to be rethought. The devil will be in the detail of course and it is quite possible that not too much will be known until the publication of the next Five Year Plan in March this year, which will start China's internal debate about exactly what 'carbon neutral' means in reality.

In one sense, carbon neutrality should be a positive for the use of gas. With the 8.3-10% target for gas as a proportion of total energy use in 2020 close to having been met (reaching just over 8% in 2020) and a 15% target set for 2030, any actions that move China more quickly towards that target will have a significant impact on the global gas market. However, targets are one thing and reality is another. The power sector is dominated by coal and gas has just a 3% market share. Apart from being more expensive than coal, gas does not have the political backing afforded to nuclear power or renewables. For gas to grow in the dominant power sector, and help reduce carbon emissions, would require coal to shrink - and that is a politically risky course of action both domestically – because of potential job losses – and internationally because of supply security concerns. Nevertheless, it is worth noting that promoting the use of gas in power generation is one of the downstream objectives set out in the NGDR and the total energy demand in the power sector is so large that even if gas use were to double from its current relatively low base, that would represent 50-60 bcm of additional gas demand.

Some observers have concluded that clean coal with carbon capture and storage may be the way forward for China's power sector – although Chinese analysts cite the high costs of CCS as a disincentive to go down that route and highlight the fact that carbon neutrality is a long-term goal while the government has many other pressing issues to focus on, including economic growth and energy supply security.

City gas and industrial gas supply are both larger components of China's gas demand than the power sector and may have better short-term prospects for growth. However, once the coal to gas switching programme has advanced sufficiently, growth beyond that will be at a considerably slower pace. In addition, given the economic rebalancing away from the industrial sector, demand growth in the sector will peak. With carbon emissions from coal being the largest and most problematic, city gas and industrial gas may escape the same level of scrutiny for a while. Analysts at Bernstein have suggested that China will achieve its target of gas representing 15% of total energy demand by 2030 but that by 2060 that figure will have declined to just 12%.¹⁹

¹⁹ <https://www.afr.com/companies/energy/china-s-net-zero-goal-to-send-coal-oil-demand-diving-20200924-p55yxf>

The coal to gas switching programme apparently continued at a smaller scale. It has not been at the same pace as in 2017/18 when gas shortages were created and, without subsidies being made available, many households will not, in any case, be able to afford to switch to gas. Nevertheless, seven million households in Beijing were due to start switching, in a seemingly voluntary manner, from coal to cleaner energy for heating so the programme is actually continuing. In addition, there were reports that no inspection teams were being sent out from Beijing last year (because of Covid-impacted travel) which means that local authorities were allowing local companies to burn lower-quality, and cheaper, coal.

This dampened demand is one reason that China sees less urgency in concluding new long-term gas supply contracts with overseas producers. Russia, for example, is clearly keen to sell more gas to China and is considering a range of pipeline options to achieve that aim. In addition to demand being constrained by the Covid epidemic, the government focus on increasing domestic production reduces the space in China's energy balance for natural gas imports. Hence there seems to have been very little serious discussion as yet about the various route options from Russia into China²⁰.

Conclusions

China's 2020 NGDR is the latest in a series of reports that set out the government's broad vision for the gas sector. It takes into account the views of the national oil companies as well as reflecting growing concerns about supply security (which emerged in 2019), initial and ambitious targets for climate, change mitigation, reforms to the sector and of course the impact of the Covid-19 pandemic on both China and the global economy.

China's gas fundamentals remain strong with both gas demand (up almost 5% to 322 bcm) and domestic gas production (up almost 10% to 189 bcm) rising. Total imports rose by more than 5% with LNG volumes up almost 12% at the expense of pipeline gas where imports were essentially flat. Despite Beijing's concerns about rising import dependency, liberalisation and low gas prices have prompted higher import volumes, particularly of cheaper spot LNG.

Reforms continued in the gas sector:

- in the upstream they focused principally on property rights reform
- in the midstream the most significant reform in the past several years has been the creation of a national oil and gas infrastructure company PipeChina to improve access to the national energy infrastructure
- in the downstream reforms focused on gas in power generation (which we see as challenging) and transport.

The midstream reforms were the most significant step forward in the past few years, although further changes are necessary (such as the appointment of a regulator and the creation of a detailed regulatory framework). While the power of the national oil companies is likely to decline, they will continue to remain influential in China.

The NGDR is relatively optimistic about the outlook for the sector, noting that the impact of all the coronavirus-related changes may be that the future development of the sector could move more quickly than might otherwise have been the case. Supply security was a concern in 2019's report and this theme continued in the 2020 NGDR, even if the actual outturn was higher imports in 2020.

²⁰ World Gas Intelligence, 8 July 2020 http://www.energyintel.com/pages/eig_article.aspx?DocId=1077402

One challenge on the horizon is Xi Jinping's announcement after the release of the NGDR that China should aim for 'carbon neutrality' by 2060. On the one hand, this ought to be a positive development for China's gas sector, which is within reach of the government's target of gas representing 8.3-10% of total energy consumption. With the 2030 target being 15%, there should be scope for gas to grow its market share – although this may be easier said than done because of supply security concerns.

With demand dampened by coronavirus and the government's focus on increasing domestic production, China sees less urgency to strike deals with gas suppliers such as Russia, despite the latter's keenness to reach agreement on additional pipeline supplies.