

IMI: Natural Gas Sector Overview in Brazil

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Summary

The Brazilian Oil and Gas sector is currently undergoing a massive investment for the exploration and development of oil and natural gas reserves. In particular, natural gas is attracting much investment because of its low carbon emission and clean energy label. With recent discoveries of huge oil and natural gas reserves, the government has been offering concession bids to domestic and foreign companies to explore and operate in the region. Although local content requirements (LCR) may restrict foreign operators, the country is offering incentives to companies who place their research centers in Brazil in order to bring in outside technology. Additionally, once the new Gas Law is fully implemented, and the Ministry of Mines and Energy (MME) concludes the 2013-2022 gas network expansion plan (“PEMAT”), it may bring more investors into the Brazilian gas sector. The market for natural gas exploration in the country is expanding and this expansion presents opportunities for U.S. companies to invest in an increasingly popular source of clean energy.

Natural Gas Market Overview

The natural gas sector in Brazil is growing and the future outlook is very promising. Currently, more than two million customers consume natural gas in Brazil, according to the 2013 BP Statistical Review. By 2020, it is estimated that Brazil will have more than 3.2 million natural gas customers, an increase of 62.5%. Between 2007 and 2010, gas utilities have invested R\$6 billion in the natural gas distribution network expansion. (Note: There are 26 gas utilities in Brazil: http://www.abegas.org.br/Site/?page_id=839.) In the four years between 2007 and 2011, there was a 45% increase in the distribution network from 4,300 km in 2007 to 20,900 km of pipelines in 2011. By 2020, the distribution network installed will increase by approximately 84% to reach 37,400 km (23,400 miles) of pipelines.

According to the Brazilian Association of Piped Gas (ABEGAS), the market for natural gas increased by 15.17% between 2010 and 2011 alone, which makes natural gas one of the fastest growing energy sectors in the Brazilian economy. The share of natural gas in the Brazilian energy matrix in 2010 was 10.3% and the projection for 2030 is that this share will reach 15.5%.

Data included in BP Statistical Review 2013 showed that Brazil ranks 3rd in Latin America for proven natural gas reserves at 16 trillion cubic feet, which is 0.2% of the world total reserves. However, the country is responsible for 0.9% of world gas consumption. The country currently ranks 2nd in consumption in Latin America at 29.2 billion cubic meters and 3rd in production at 17.4 billion cubic meters. Brazil makes up for this deficit by importing 10.1 billion cubic meters of natural gas from Bolivia through the GASBOL pipeline and imports 3.2 billion cubic meters of liquefied natural gas (LNG) from several other countries. The Brazilian government is

aggressively promoting exploration and development in the oil and natural gas sector. The most recent oil field auction was held on November 28, 2013. Out of 240 onshore gas exploration blocks auctioned by Brazil's National Petroleum Agency (ANP), domestic and foreign companies purchased 72 of them. Either a domestic or a foreign company can be an operator at these blocks upon previous approval by ANP as part of the pre-qualification auction phase. These blocks were offered under a concession regime. Petrobras had the winning bid for 49 blocks, either alone or in consortiums with other firms. A total of 12 companies won bids for gas blocks: GDF Suez, Alvo Petro, Companhia Paranaense de Energia, Bayar, Cowan, Geopark, Nova Petróleo, Ouro Preto, Petrobras, Tucumann, Petra Energia and Trayectoria. The Brazilian government raised R\$ 165.2 million (US\$ 71.5 million) with the sale of these concessions, which, according to the ANP, should see over R\$ 500 million (US\$ 216.6 million) in investment. Results of all other oil auctions can be seen at ANP's website http://www.brasil-rounds.gov.br/index_e.asp. Petrobras alone is planning to invest \$237 billion over the next five years in oil and gas exploration and development with \$10 billion exclusively slated for natural gas exploration and development. Petrobras' oil and gas pipeline network in Brazil currently measures 11,000 km.

The Pre-Salt Gas Pipeline Projects

Recently, Petrobras has canceled a US\$500 million tender for the construction of the "Route 3" offshore gas pipeline that will carry gas to be produced by the pre-salt fields. The Libra pre-salt field, for example, is estimated to produce 120 million cubic meters of gas over five years. The Route 3 gas pipeline is the largest of the three gas pipeline projects planned by Petrobras for the Santos Basin pre-salt area. It will reportedly consume 150,000 tons of steel pipes throughout its 300 km length. Petrobras may re-announce the Route 3 tender in the first quarter of 2014 with a revised project scope aimed at reducing costs. The Route 1 gas pipeline, linking the Lula pre-salt field to the Mexilhão oil offshore platform, is already in operation carrying about 10 million cubic meters of gas per day to the Caraguatatuba gas treatment plant in São Paulo. The Route 2 gas pipeline is under development with planned operation by mid-2014. It will eventually carry gas to the Cabiúnas gas treatment plant in Rio de Janeiro. The Brazilian Association of Piped Gas (ABEGAS) website shows a gas pipeline map http://www.abegas.org.br/Site/?page_id=842 containing existing, planned, and gas pipelines under development.

Although Petrobras will remain the largest player for years to come, a new Gas Law approved in March 2009 is expected to attract new players for this segment, once the National Oil Regulatory Agency (ANP) completes the regulatory framework, which is still under discussion. Trade sources believe that this new law may pave the way for additional business opportunities and niches for gas equipment and services suppliers.

Status of Gas Law No. 11.909

In March of 2009, Brazilian Gas Law No. 11.909, or "The Natural Gas Act", was enacted to regulate transportation, treatment, storage, liquefaction, regasification, and commercialization of natural gas. This law was introduced to attract foreign investment into the country by regulating the privatization and bidding process and reducing transaction costs of natural gas operations. The activities now being incorporated by the Gas Law were not clearly defined in Oil Act Number 9,478 of August 6th, 1997. Thus there is a real need for a clarification of the Gas Law to

permit it to regulate operations in the gas market in Brazil. Currently, ANP is collecting input from the industry to finalize a few outstanding points of the Law. Some key points open to public consultation include changes to the regulatory framework for Liquefied Petroleum Gas (LPG) distribution, calculation of transport rates, and regulations for the loading of natural gas.

Some of the key highlights of the Natural Gas Act are:

1. Establishes ANP and MME as regulating authorities of natural gas operations by clearly defining roles of each institution in planning and regulating the gas industry to reduce uncertainty;
2. Concession contracts for natural gas transportation providers will last for 30 years (*);
3. Storage of natural gas will be carried out by companies with headquarters and administration in Brazil, at their own expense and risk;
4. Establishes obligation between investor and conceder. (For example, operators will be required to provide technical, operational, economic, and financial information to ANP, the conceder. The conceder, in turn, will evaluate and approve contracts involving the gas transportation providers and end users.);
5. Declares that exploration and production procedures remain unchanged according to Oil Law 9.478/97; and
6. Establishes rules for underground or geological storage.

(*) On January 13, 2014, the MME published a draft of the 2013-2022 PEMAT Program that can be viewed at the following link:

http://www.mme.gov.br/mme/galerias/arquivos/noticias/2013/PEMAT_2013-2022.pdf.

(Note: The document is 282 pages long and is in Portuguese.) Inputs may be submitted to MME not later than February 26, 2014 to: pemat@mme.gov.br).

The MME indicated that over the next months there will be technical meetings with natural gas stakeholders in Brazil (e.g. producers, consumers, gas utilities, etc.) to discuss results of the public consultations. The MME expects to publish a final version of the 2013-2022 PEMAT by the first quarter of 2014. At some recent natural gas seminars, industry sources noted, however, that the MME wants to determine whether Brazil has commercially viable natural gas resources needed to support a long-term energy planning. Reportedly, the MME wants to wait to see whether gas projects prove viable before directing resources to building supporting infrastructure such as gas pipelines. In any case, the next step after the PEMAT is published will be the announcement of the first auction for the construction of the Guapimirim-Itaboraí (Rio de Janeiro) gas pipeline. This pipeline will be 7 miles long and will transport 17.4 cubic meters/day from Guapimirim, one of the arrival points of the gas from the pre-salt fields, to Itaboraí to supply the gas to the new gas petrochemical complex COMPERJ, which is currently under construction. The winner of the 30-year concession will be the company that offers the lowest transportation tariff.

The following is a comparative chart between regulatory frameworks of the Oil Act and Natural Gas Act provided by ANP:

Oil Act vs. Natural Gas Act

	Law 9.478/97 (Oil Act)	Law 11.909 (Natural Gas Act)
Natural Gas Transportation	Authorization by ANP	Concession granted by ANP - Concession agreement sign with MME - 30 years (up to 30 year extension)
Gas Quality	Established by ANP	Established by ANP
Gas Transportation Agreement	Approved by ANP	Approved by ANP
New Pipelines	Proposal by player	Proposal by MME
Access	Negotiation between agents	Open season procedures for firm transport service
Transportation Tariffs	Negotiation between agents	Concession or previously approved by ANP
Gas Storage	No regulation	Concession or authorization by ANP
Import and Export	Authorized by ANP	Authorized by MME
Gas Trading	Authorized by ANP	Authorized by ANP
Contingency	No regulation	ANP supervises natural gas transportation in pipelines - Contingency committee coordinated by MME

LNG, LPG, CNG, and VNG in Brazil

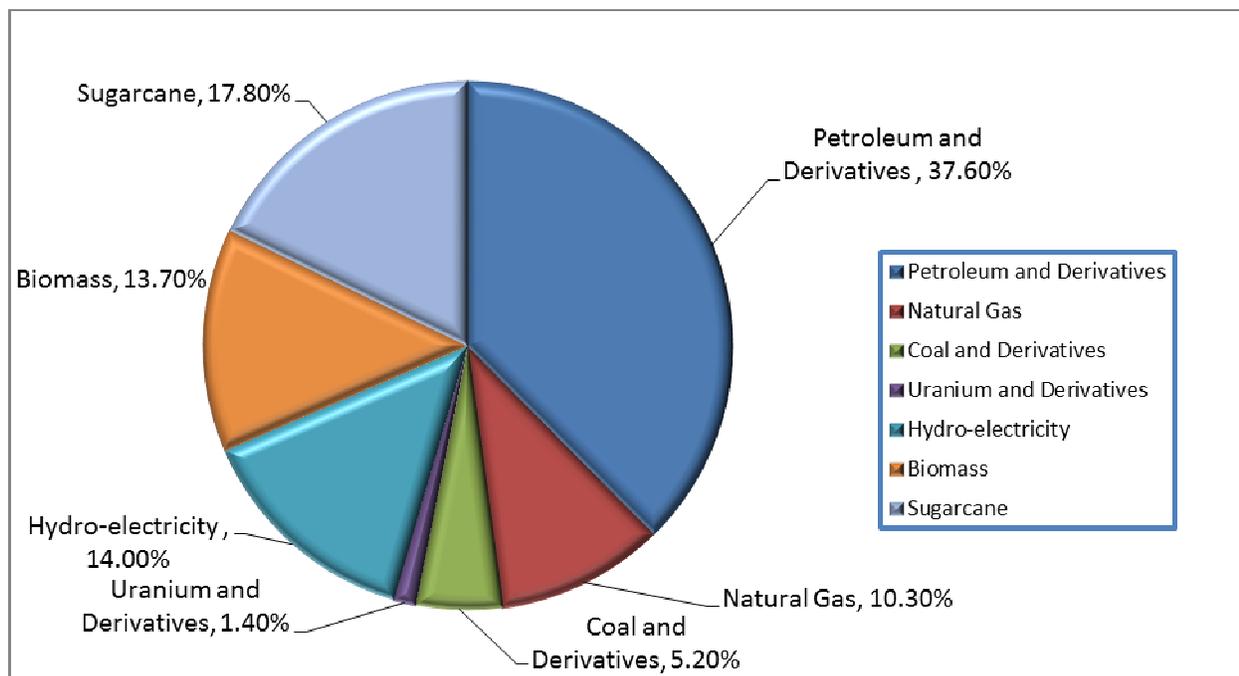
Liquefied Natural Gas (LNG): Natural gas in the liquefied state is mainly used for transport to markets where it is then re-gasified and distributed again as natural gas through pipelines. Over the last few years demand for LNG in Brazil has been growing. In 2012, Brazil imported 56 cargoes of LNG, up 17 from 2011. The country is expected to import approximately 60 cargoes of LNG in 2013 and estimates for 2014 are even higher. The demand for LNG is due to shortages from hydroelectric plants during the Brazilian dry season. Brazil currently imports a large part of its LNG from Bolivia but has also been importing from countries such as Trinidad and Tobago, Qatar, and the United States. Petrobras currently has two regasification terminals in the States of Ceará and Rio de Janeiro and is planning to open two more in the states of Bahia and Rio Grande do Sul.

Liquefied Petroleum Gas (LPG): Liquefied petroleum gas, or propane, is widely used throughout Brazil as cooking gas. In 2012, Brazil produced about 52,346 barrels of LPG according to Brasil

Argentina	36.1	41.0	44.9	45.6	46.1	44.8	44.1	41.4	40.1	38.8	37.7	1.1%
Bolivia	4.9	6.4	9.8	11.9	12.9	13.8	14.3	12.3	14.2	16.5	18.7	0.6%
Brazil	9.2	10.0	11.0	10.9	11.2	11.2	14.0	11.7	14.4	16.7	17.4	0.5%
Colombia	6.2	6.1	6.4	6.7	7.0	7.5	9.1	10.5	11.3	11.0	12.0	0.4%
Peru	0.4	0.5	0.9	1.5	1.8	2.7	3.4	3.5	7.2	11.3	12.9	0.4%
Trinidad and Tobago	19.3	27.0	30.2	33.0	40.1	42.2	42.0	43.6	44.8	42.9	42.2	1.3%
Venezuela	28.4	25.2	28.4	27.4	31.5	29.5	30.0	28.7	31.0	31.3	32.8	1.0%
Other S. & Cent. America	3.3	3.1	3.1	3.4	3.8	3.9	3.7	4.2	3.6	3.1	3.6	0.1%
Total S. & Cent. America	107. 9	119. 4	134. 7	140. 5	154. 3	155. 7	160. 4	155. 9	166. 6	171. 5	177. 3	5.3%

BP Statistical Energy Review 2013

Brazil Energy Matrix



Source: http://www.abegas.org.br/Site/?page_id=1158

<http://www.pwc.com.br>

BP Statistical Energy Review 2013

<http://www.eisourcebook.org/cms/Brazil%20Natural%20Gas%20Industry%20-%20Regulation,%20Market%20&%20Investment.pdf>

<http://www.igu.org/html/wgc2009/papers/docs/wgcFinal00707.pdf>

<http://www.platts.com/latest-news/natural-gas/brasil/brazil-could-import-60-cargoes-of-lng-in-2013-21152115>

<http://www.igu.org/gas-knowhow/publications/igu-publications/LNG%20Report%202011.pdf>

<http://www.ogj.com/articles/print/volume-109/issue-23/processing/special-report-worldwide-gas-processing-stability-of-lpg.html>

<http://media.argusmedia.com/~media/Files/PDFs/Samples/Argus-International-LPG.pdf>

<http://riotimesonline.com/brazil-news/rio-business/natural-gas-flex-cars-in-brazil/#>

Additional information on the Brazilian oil and gas sector, including upcoming trade shows in Brazil and power point presentations that detail best sales prospects by Petrobras, can be viewed at:

http://export.gov/brazil/industryhighlights/energy/eg_br_051813.asp

http://export.gov/brazil/industryhighlights/energy/eg_br_023986.asp