

## **IMI: Shale Gas Prospects in Brazil**

**August 23, 2013**

### **Overview:**

Several countries are attempting to follow the success of the United States in taking advantage of their shale gas resources revolution. Brazil's proven gas reserves and potential reserves, makes it an interesting case with potentially lucrative opportunities for U.S. Companies.

The shale potential in Brazil is somewhat ambiguous but extremely significant in any case. Currently, the country ranks 10<sup>th</sup> in proven recoverable shale gas reserves with roughly 250 trillion cubic feet ("tcf"). However, a recent report by Brazil's National Petroleum Agency ("ANP") said Brazil's reserves could actually total as much as double that amount.

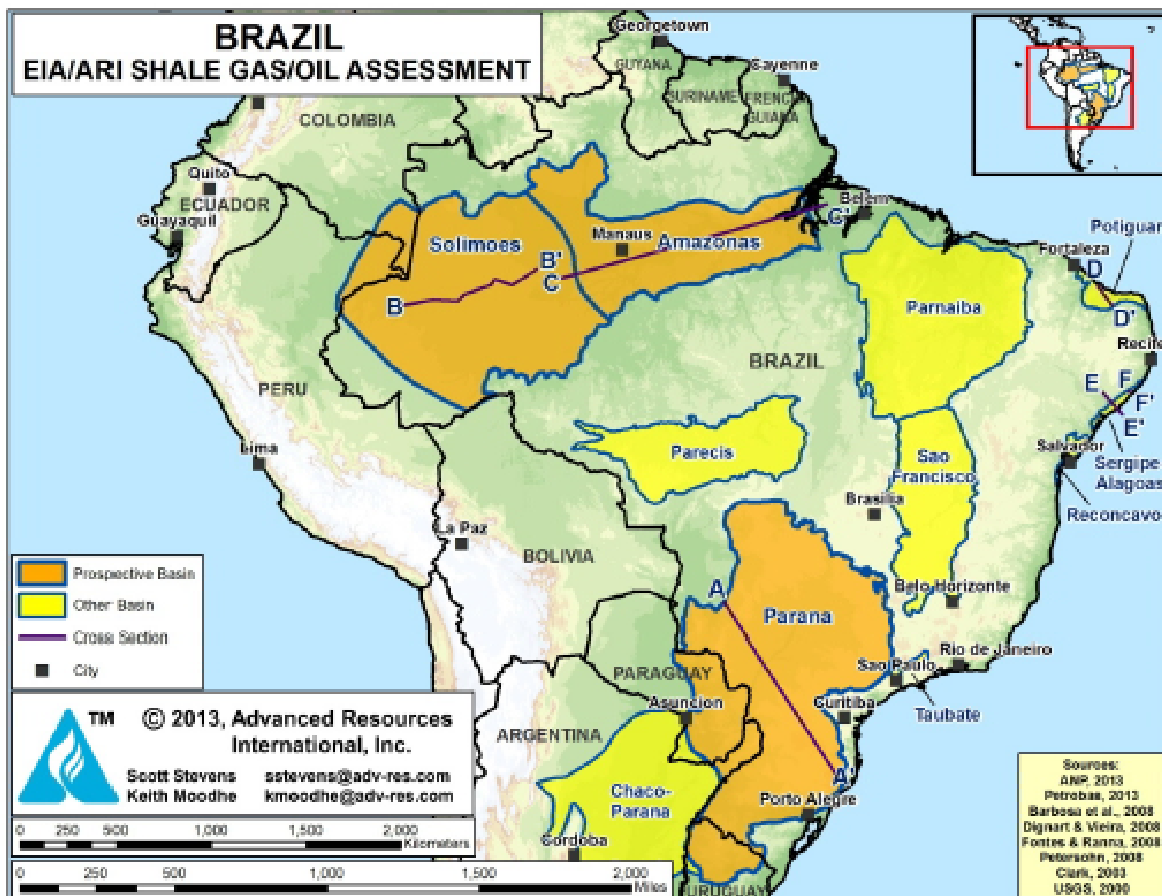
<b>Rank</b>	<b>Country</b>	<b>Shale gas (trillion cubic feet)</b>	
<b>1</b>	China	1,115	
<b>2</b>	Argentina	802	
<b>3</b>	Algeria	707	
<b>4</b>	U.S. <sup>1</sup>	665	(1,161)
<b>5</b>	Canada	573	
<b>6</b>	Mexico	545	
<b>7</b>	Australia	437	
<b>8</b>	South Africa	390	
<b>9</b>	Russia	285	
<b>10</b>	Brazil	245	
	<b>World Total</b>	<b>7,299</b>	<b>(7,795)</b>

Source: U.S. Energy Information Administration ("EIA"). EIA estimates were used for ranking order. ARI estimates in parentheses.

Brazil's shale and tight gas potential exists primarily in three prospective basins, which have a potential of 204 tcf. These basins – Parecis, Parnaíba, and Recôncavo – are three of 18 onshore sedimentary basins, of which, 14 basins may have petroleum source rocks. Part of the reason for the delay in exploring shale gas resources is due to Brazil's focus since the 1980s on its offshore oil and gas resources and more recently on pre-salt oil, while the onshore basins have seen less activity.

Another potentially massive reserve, the San Francisco Basin, exists in Minas Gerais State. Consultants at Wood Mackenzie have estimated that the basin could hold up to 600 tcf (17 tcm) of gas – greater than Marcellus shale formation. Press reports indicate that Shell will drill in Minas Gerais, where closely-held Petra Energia SA is becoming the leading unconventional gas explorer in Brazil, focusing on so-called tight gas sandstones and tight gas carbonates. The company has reportedly discovered gas in 12 of 14 wells it drilled in the Sao Francisco basin.

Figure VI-1: Prospective Shale Basins of Brazil



Source: ARI, 2013

Parecis Basin

124 tcf (3.5 tcm)

- Parnaíba Basin 64 tcf (1.8 tcm)
- Recôncavo Basin 20 tcf (566 bcm)

## **Bidding Rounds**

On November 28 and 29, ANP will auction 240 blocks in both frontier basins and established producing areas for conventional and non-conventional oil and gas exploration. The blocks total roughly 102 mi<sup>2</sup> distributed among the Parnaíba, São Francisco, Paraná and Acre basins, according to information published at the ANP website: [http://www.brasil-rounds.gov.br/round\\_12/ingles\\_R12/areas\\_oferecidas.asp](http://www.brasil-rounds.gov.br/round_12/ingles_R12/areas_oferecidas.asp)

The concessions of land in primarily remote areas of the country are one of several obstacles Petrobras and other oil companies will have to overcome. Infrastructure, such as roads and pipelines would need to be built from scratch or drastically improved. Additional bottlenecks may be the lack of local equipment and services such as high pressure pumping systems, chemical products, large amounts of treated sands required for hydraulic fracturing, besides a trained workforce (e.g. technical labor to prepare and manage specific drilling fluids at required pressures, and others to monitor environmental impacts, among other services.) Analysis is still needed to determine if the economics makes drilling feasible. That is, if the price of gas justifies its exploration, drilling and production, and if natural gas will grow as a percentage share in Brazil's electrical power matrix. (Currently, natural gas power plants account for 10.32% of Brazil's power generation.) Another potential issue is that in Brazil, contrary to the United States, the owner of the land does not own the resources underground - they belong to the Federal Union, i.e. the Brazilian government.

Finally, because of the focus on pre-salt oil, the regulations regarding unconventional gas are in their infancy. Despite these challenges, the Brazilian government is intent on making shale gas a priority. Minister Lobão said, "Brazil needs to produce more natural gas Consumption has been going up. We are consuming a little more than [2.8 billion cubic feet] daily, but we have the potential to grow. We could consume more than [5.3 billion cubic feet] by 2020. If we produce more gas, we will certainly be encouraging the industrial sector to consume more."

## **Companies in Brazil with Shale Activities**

At the soonest, Brazil could begin drilling for shale in 2015. The struggles for shale to emerge however are not stopping companies from getting in on the action. Petrobras itself is aiming to produce 7 billion cubic per day of gas by 2020, which ministers are hoping will lead to a fall in gas prices of around 50%. Foreign companies are also

interested. Gran Tierra, a Canadian oil and gas exploration and production company, has purchased over 20,000 acres and already begun horizontal drilling, and, as noted earlier in this report, Royal Dutch Shell already owns five exploratory blocks that it will develop along with Petrobras.

Commercial Service Rio plans to approach the winners of the bidding rounds in November and inquire about their products and service needs. We will then do further market reporting to notify U.S. Companies of the opportunities.

### **Market Opportunities**

According to an article published in the Brasil Energia magazine of May 2013, the main equipment and services demand for non-conventional oil and gas exploration include the following:

Drilling: geo-navigation tools and telemetry systems

Fracking: multi-zone completion tools, large hydraulic power fracking trucks, fluids, support agents (sand, bauxite, and proppants), high volume mixers, monitor and control command centers, specific shale gas fracking simulation software, friction reduction additives, and others.

Logistics: water and support agents (e.g. sand, etc.) supply, water treatment and water reuse units, land space for fracking activities, for fluid storage tanks, mixers, command centers, etc.

Commercial Service Rio invites U.S. companies with an interest in bidding on the concessions, or, supplying product or services to the winning bidders, to contact our office. Due to the local content (LC) policy which requires a minimum percentage of domestic content for a variety of equipment and materials to promote domestic Brazilian industry, and federal import taxes which can range as high 25-35% depending on the material or good, U.S. firms are best positioned to access the Brazilian market through partnering with a local agent or distributor. Additionally, to participate in governmental tenders, U.S. companies are legally required to partner with a Brazilian firm or representative. Consequently, we recommend US firms to hire a local representative, agent or distributor for their products and services or – if there are enough market opportunities – consider, in the future, opening a local branch or subsidiary in Brazil. The Commercial Service has a vast network at our fingertips, supported by more than 1500 international industry and trade specialists whose job is to provide the best source of customized solutions for US companies and their Brazilian partners to do business in the global marketplace.

Using the U.S. Commercial Service's Gold Key Service (GKS), we can arrange one-on-one meetings with potential partners.

When asked if Brazil can exploit its large reserves of shale and become a major producer, Minister Lobão responded confidently, "The country can become a major producer. We have large reserves like the United States, China and Argentina."

Useful Links:

ANP: <http://www.anp.gov.br/>

Bidding Rounds:

[http://www.brasilrounds.gov.br/round\\_12/ingles\\_R12/areas\\_oferecidas.asp](http://www.brasilrounds.gov.br/round_12/ingles_R12/areas_oferecidas.asp)

FCS Rio Oil and Gas energy webpage:

[http://export.gov/brazil/industryhighlights/energy/eg\\_br\\_051813.asp](http://export.gov/brazil/industryhighlights/energy/eg_br_051813.asp)