

Brazil's Oil Discoveries Bring New Challenges

Brazil's discovery of large offshore oil reserves holds the possibility of raising the country's profile in the international energy market and bringing an influx of wealth to the country. Safeguarding the nation's economy against the downside of newfound resource wealth is among its leaders' concerns.



While deepwater drilling permits in the United States were being withheld because of concerns about safety and the environment, Brazil is moving at full speed to develop its massive deepwater reserves. In fact, Petrobras, the country's state-run oil company, has already committed to investing \$224 billion through 2014 in its plan to develop deepwater fields off the country's coast.

The Brazilians have much to be optimistic about. The discovery of the Tupi oil field in October 2006—the largest oil field found in the Western Hemisphere in 30 years—signified Brazil's emergence as a global oil power. During the inaugural extraction from the Tupi super-field, former president Luis Inacio Lula da Silva described the country's newfound oil riches as a “second independence for Brazil.” (In December 2010, the Tupi field was renamed “Lula.”) Although the oil finds present an enormous opportunity for Brazil, the logistical and political challenges involved in developing the fields leave much of the future unmapped, however.

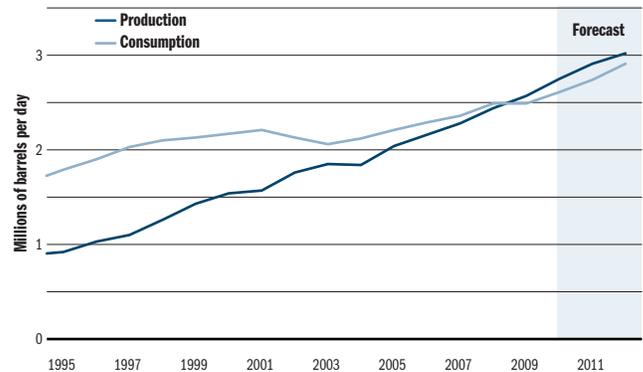
Pre-salt discoveries: Striking gold

According to the *Oil & Gas Journal (OGJ)*, Brazil has 12.9 billion barrels of proven oil reserves for 2011, the second largest in South America, after Venezuela. The Santos Basin, the Germany-sized offshore pre-salt basin about 200 miles southeast of São Paulo, has been the site of several new oil fields, including Carioca, Iara, Libra, and Lula. The location of the Santos Basin beneath deep layers of salt—remnants from ancient oceans trapped deep below the ocean in rock—kept it hidden until recent technological breakthroughs led to its detection. However, locating the oil is just one step in an inevitably lengthy process that poses significant technological challenges.

Brazil's National Petroleum Agency estimates that the Santos Basin area contains 50 billion barrels of reserves, and a recent study by a former Petrobras geologist found that the area may hold as much as 123 billion barrels of oil. (By way of comparison, Saudi Arabia's proven reserves are 267 billion barrels.) However, only a fraction of these estimates is currently considered “proven” as technological and logistical constraints deem much of the resources unrecoverable or uneconomical at today's oil prices. Regardless of how much oil ultimately lies off Brazil's Atlantic coast, it is clear that Brazil is rapidly on its way to becoming a leading exporter of petroleum.

The discovery of Brazil's vast subsalt (also known as pre-salt) resources quickly transformed the focus of Brazil's energy sector. Unlike most of the petroleum previously produced in Brazil, the subsalt field contains lighter and sweeter oil, which is more easily processed and commands a higher price in global markets. However, the considerable logistical challenges presented by the unprecedented depth (nearly four miles of sand, rock, and salt beneath the seabed) mean that production is likely to be both difficult and costly.

Brazil: Oil Production and Consumption, 1995–2012



Source: EIA Short-term Energy Outlook, January 2011

Though Brazil's subsalt oil will not be produced in significant volumes for years to come, the global energy community is already taking note of how the country's expected export capacity will play a major role in the global energy market. This new capacity could be particularly consequential in Latin America, especially as production in the two largest net oil exporters in the Western Hemisphere, Mexico and Venezuela, is forecast to decline.

Rising oil production and relatively flat consumption growth moved Brazil from net importer to net oil exporter status in 2009, according to the U.S. Energy Information Administration (EIA) (see the chart). This newfound status is quite a dramatic contrast from the days of the oil crises of the 1970s, when Brazil's heavy dependence on petroleum imports brought devastating economic consequences. Brazil's vibrant ethanol industry emerged in the 1980s, following a series of oil shocks, as part of a strategy to reduce dependence on oil imports. Increasing oil production shouldn't hinder the growth of the nation's sugarcane-derived ethanol industry. Ethanol usually costs less and is mostly consumed domestically, with demand spurred by Brazil's expanding fleet of flex-fuel cars. Higher consumption of biofuels at home means that more higher-cost petroleum will be exported. According to Ricardo Dormelles of Brazil's Secretariat for Petroleum, Natural Gas and Renewable Fuels, “The discovery of subsalt [petroleum] won't reduce the importance that the government attributes to the development of the biofuel sector.”

The Santos Basin discovery was particularly important from an international energy perspective because the energy industry—long known for its optimism about a seemingly limitless supply of oil—has only recently begun to express a bit more caution. The International Energy Agency (IEA), a global energy watchdog long known for its confidence about the future availability of oil, took a big turn in fall 2010 by announcing that the

The Risks of the “Resource Curse”

Brazil’s former president Lula referred to discoveries of large petroleum reserves as “superior to all the opportunities offered to us by our history” on September 24, 2010, during an event marking the conclusion of Petrobras’s record-breaking share offering. Indeed, Brazilian policymakers have high expectations that the discovery of these reserves will reduce poverty and lead to long-term sustainable economic development.

However, to achieve these goals, Brazil will need to avoid the so-called “resource curse,” the term economists give to a phenomenon that can occur in countries rich in natural resources: their growth rates are lower than those in countries without such endowments. This occurrence is also called “Dutch disease,” from the impact that the discovery of a significant North Sea natural gas deposit had on the Netherlands economy in the 1960s. Venezuela and Ecuador, the two largest oil exporters in Latin America (measured as a percentage of GDP), are two primary examples of countries affected by this phenomenon—both have averaged lower economic growth and higher inflation than other Latin American countries during the past three decades.

Many observers fear that Brazil could also experience the resource curse because the returns on investment in oil are so large that they divert investment from other economic activities. A surge in revenue from petroleum exports can lead to a surplus in a nation’s balance of payments, which then results in a stronger domestic currency. The overvalued exchange rate would

world had likely already passed a peak in world oil production. So the energy community seems to be embracing the idea that large discoveries—like Brazil’s pre-salt find—are unlikely to occur at a frequency as high as had been experienced in the past.

Such large oil discoveries—the ones that revise expectations for the future global supply environment—are increasingly

rare nowadays, as exploration drilling and seismic technology have already scoured most of the planet for “liquid gold.” The United States Geological Survey (USGS) estimated in 2000 that the earth’s oil resource endowment falls somewhere between five trillion and six trillion barrels, with

result in a loss of competitiveness in other economic sectors as imports become cheaper and exports more expensive.

Actually, concerns about “resource curse” and “Dutch disease” in Brazil have existed for some time, and the recent oil discovery has only amplified critics’ warnings. Recent research by economist Fernando A.S. Postali, of the University of São Paulo, found that municipalities in Brazil currently receiving petroleum royalties had lower economic growth rates than did municipalities that were not eligible for royalties. Another study, by Sérgio Wulff Gobetti, economist for the Institute for Applied Economic Research, found that the top 100 Brazilian municipalities receiving royalties had similar levels of investment as those not receiving any royalties but spent 33 percent *more* per capita on financial compensation for employees. Gobetti therefore concluded that other ways of distributing royalties should be considered.

Meanwhile, in December, Petrobras CEO Jose Sergio Gabrielli warned of Dutch disease when he noted that hasty development of Brazil’s deepwater reserves could hurt other industries as they struggle to compete for labor, resources, and capital at a time when the oil industry is already expanding at a rapid pace. “If you accelerate this much...the risk of Dutch disease increases,” he commented.

Brazil has instituted a social fund intended to combat this threat. The revenue that accrues to the fund from the pre-salt oil revenue is intended to contribute to economic stabilization and is planned for investment in education, health, culture, science, and technology, as well as to combat poverty and mitigate climate change. ■

only about 650 billion barrels yet to be found. All oil finds are not created equal, however, as much of the most accessible and easily extractable oil has already been produced. So the remaining 650 billion barrels is largely thought to be more challenging and expensive to find and develop.

Restructuring Brazil’s oil industry

According to the EIA, energy consumption in Brazil has increased by nearly a third over the past decade as the economy expanded robustly. The Brazilian government has long stated its goal of increasing domestic energy production—to meet internal demand, and with hopes to take on an important energy-exporting role on the international stage. Thus, the timing and the scale of the recent subsalt oil discoveries have driven oil to the top of the political agenda.

The government has instituted a variety of measures aimed to take greater control of the country’s oil industry in the wake

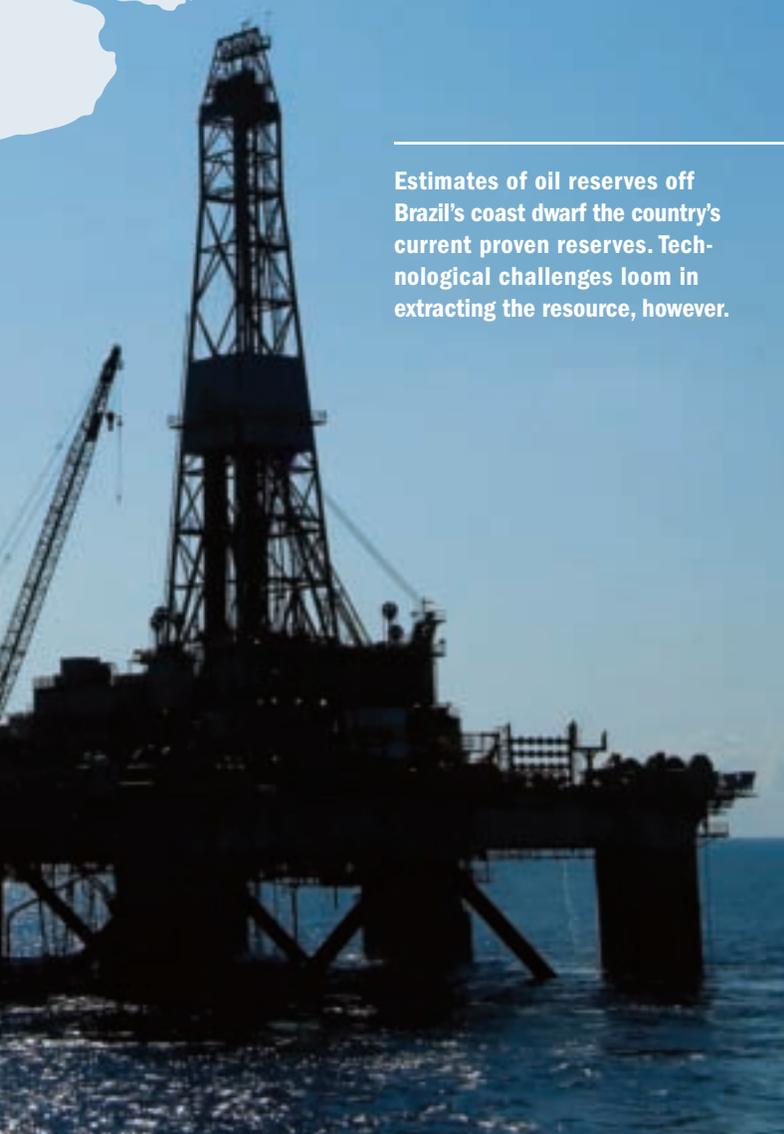
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Laurel Graefe and Steve Kay of the Atlanta Fed’s research department discuss various aspects of Brazil’s oil discovery. On frbatlanta.org, select “Podcasts.”





Estimates of oil reserves off Brazil's coast dwarf the country's current proven reserves. Technological challenges loom in extracting the resource, however.



of the subsalt discoveries, hoping to use the new source of wealth to broaden and deepen the country's industrial base. In September 2010, Petrobras sold nearly \$70 billion in new shares, marking the largest sale of stock in history. The sale of stock will fund the \$42.5 billion purchase of five billion barrels of oil of offshore reserves from the government, and the proceeds will finance the Brazilian government's purchase of a larger stake in Petrobras, a move that means Brazil's government will increase its total ownership stake in Petrobras to 48 percent from 40 percent.

Brazil recently instituted a new production-sharing agreement for areas designated as "subsalt" and "strategic," while previous concession arrangements remain in place for other areas. Under the new system, Petrobras will be the legal operator of the fields and will be required to hold a minimum 30 percent stake in new projects. Companies that offer to provide the biggest percentage of oil output to Petrobras will win bids to participate. The government also created a new state-owned oil firm, Pré-Sal Petróleo S.A. (known as Petrosal), which will represent the government in pre-salt joint ventures.

The Brazilian National Development Bank (BNDES) forecasts that developing the offshore oil could generate \$240 billion worth of goods and services over the next four years. The government wants 65 percent of those purchases to be sourced domestically, with the aim of developing the local oil services industry.

Some oil industry experts question whether Brazil's oil services industry will be able to keep up with this surge in activity. For example, Petrobras will have to hire thousands of new engineers in a very short period of time, potentially straining the industry's current labor supply. Analysts expect that, even with the quickly expanding national oilfield service industry, Petrobras may have to lean heavily on foreign companies and labor in order to keep pace with announced plans. Brazil's infrastructure also faces challenges, as the country's ports, airports, and roads are already straining as rising economic demand outpaces domestic infrastructure investment.

Though the government's growing participation in the oil industry is intended to help foster sustainable growth, critics are wary of greater government intervention in logistical production decisions and caution that politicizing decisions about developing the fields could backfire. Nonetheless—as the record-breaking stock offering attests—the global community remains optimistic that Brazilian industry will rise to the challenge. ■

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