

Meeting the pre-salt challenge

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The country's pre-salt discoveries could be taken as proof that "God is a Brazilian"

Five years ago, Brazil's national oil company Petrobras provoked a collective gulp of surprise in the global oil and gas market when it announced offshore reserves in its 'pre-salt' plays on a scale of the UK's North Sea.

The pre-salt (below the salt) reserves located just 200 kilometres off the Brazilian coast, stand to more than double the country's existing proven and probable reserves of 20 billion (bn) barrels, with conservative estimates of the area suggesting reserves of at least 50 bn barrels, 15 bn barrels of which is believed to be recoverable.

Thanks to the discovery, Brazil is set to be propelled into the world's top five producers within the space of barely more than a decade. As President Dilma Rousseff has quipped, the pre-salt discoveries could be taken as proof that "God is a Brazilian". Five years on from the announcement, Petrobras, under its new CEO Maria das Graças Silva Foster is putting flesh on the bones of plans to develop the reserve base.

The company is setting aside substantial volumes of capital expenditure for the pre-salt fields, which will account for 24 per cent of the a total of US\$25.4 bn

exploration spend in the 2012 to 2016 period.

Since 2011, the pre-salt has gone live. Last summer, Petrobras shipped its first cargo of pre-salt oil to a customer in Chile. There have already been some quick wins. One of the pre-salt wells has already emerged as a high-yielding 36,000 b/d well in the space of barely more than a year since initial commercial development.

As part of its pre-salt plans, Petrobras has ordered 65 deep-water units to become operational by 2020, 39 of which are due to be deployed as early as 2014.

And while Foster has recently reined back some of the company's more ambitious targets – under its new 2012-16, US\$236.5 bn investment plan, Petrobras says it will produce about 5.7 million (mn) barrels of oil equivalent a day (boe/d) in 2020 compared to the original plan for 6.9 boe/d year – there is widespread confidence that the company's long track record in offshore development will stand it in good stead as it meets the substantial financial and technical challenge head-on.

Petrobras's deep-water expertise is market leading. In the last five years, more than 50 per cent of new discoveries worldwide were made in deep waters, and Brazil alone accounts for 63 per cent of these, says Petrobras. Already, Brazil accounts for 22 per cent of the world's deep-water production.

What's more, according to projections from US-based consultancy PFC Energy, as Brazil develops these newly discovered reserves, it will lead non-OPEC supply growth in the period up to 2030. "The pre-salt is very much a game changer for the whole industry," says Peter Bassett, assistant head of oil and gas at Westhouse Securities. "If you include Angola's pre-salt reserves (part of a joint Jurassic era geological play) you are talking about 3-5 mn barrels a day (b/d) coming on stream by 2020, which is the equivalent of a new Norway or UK."

With current world oil production estimated at 85 mn b/d, this would represent around 4 per cent of the total – a significant new source of energy by any standard. Even more important, says Bassett, this is non-OPEC production, and not subject to the cartel's output quotas. Neither is it subject to Middle Eastern-style political risk being located a long way from strategically sensitive areas like the Straits of Hormuz, through which a substantial slice of global oil must pass.

"Since Brazil is not in OPEC, it may try and sell as much of this as possible through the market, which will

3D illustration of Brazil's pre-salt deposits (not to scale)

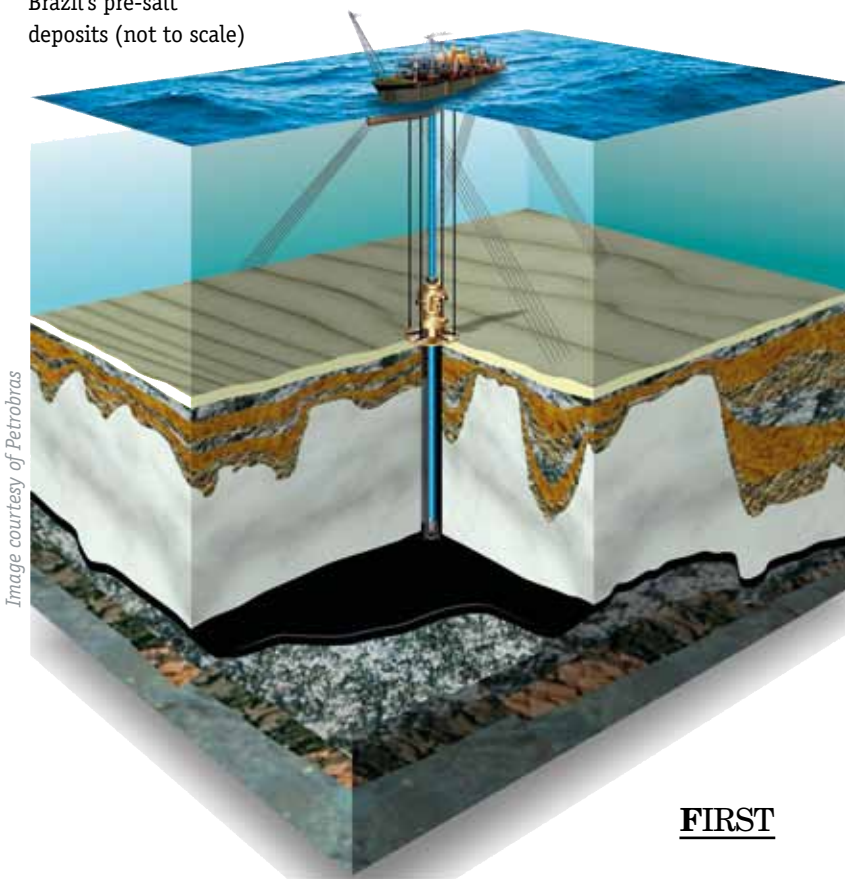


Image courtesy of Petrobras

tend to reduce OPEC's pricing controls," says Bassett.

If the transformative impact of Brazil's pre-salt resources is clear, questions of Petrobras's capacity to meet its still ambitious production targets have yet to be fully answered.

True, the company boasts a formidable technical and R&D capacity, honed from many years of deep-water exploration and development. Innovation is hard-wired into the fabric of the company. Having gained comfort working at increasingly deep depths of up to 3,000 metres – the main pre-salt acreage lies in depths ranging between 2,000-3,000 metres – the company is targeting breakthroughs based on its sophisticated mapping techniques that scan through the salt layer.

The pre-salt, though deep-water and complex, is regarded as having significant exploration risk compared to other geographies. Petrobras claims a success rate of 75 per cent in the pre-salt, which compares to a world average of 25 per cent. Neither is Petrobras alone in its endeavour in tapping the pre-salt. A number international oil companies have been lured to Brazil in the prospect of rich offshore pickings, with at least 36 foreign players active in the country's upstream.

Some of these firms have racked up some impressive results. In February 2012, Norway's Statoil announced a major discovery in the pre-salt, a wildcat well at the Repsol-operated Sugar Loaf prospect in Campos basin showing flows of 5,000 b/d of light oil and 28.5 mn cubic feet per day of gas in a choked drill stem test. Repsol described it as one of the thickest discovered in

Brazil to date and with potential.

The UK's BG Group has invested more than US\$5 bn in Brazil's pre-salt having first acquired acreage in the Santos basin back in 2000. The company sees its Brazilian holdings reaching 2.3 mn b/d of installed capacity by 2017 and producing 600,000 b/d by 2020. As proof of its commitment to Brazil, the company has indicated that it will spend US\$42 bn in its operations in the next 10 years.

There are though major challenges still to come if the full potential of the Brazilian pre-salt is to be realised. One is the substantial financing costs which some estimates could approach up to US\$1 trillion. The massive funds that Petrobras will need to stump up may force it to farm out more of its acreage to foreign players.

Petrobras has so far encountered relatively little difficulty in raising finance for these sizeable new plays. In 2010, with global financial markets still in the doldrums, it raised more than US\$70 bn in a share offering intended to fund its offshore projects.

Nonetheless, raising further tranches of funding and ensuring that the massive engineering task is met, still represents a formidable challenge, even for a sovereign-rated entity like Petrobras. "They have some aggressive production targets, especially if you consider than oil majors like ExxonMobil and Shell only have gently rising production profiles at the moment," says Bassett. "Even the scaled-back targets announced in June this year are a big ask, as not only do they have ►

Petrobras claims a success rate of 75 per cent in the pre-salt, compared to a world average of 25 per cent



Image courtesy of Schlumberger

Advanced seismic techniques, such as WesternGeco's coil-shooting technology shown here, are enabling Brazil to define and exploit its pre-salt reserves more effectively

◀ to finance it they have to get delivery of the floating systems, and they have to have a programme that will not be interrupted by bad weather or accidents.”

One key challenge that both Petrobras and the foreign companies active in Brazil’s offshore will have to navigate is the issue of strict local content requirements.

“Above ground” issues are seen as having an impact on project timetabling. Local-content requirements are becoming more demanding and apply to the full pre-salt supply chain. Under rules first announced by former Brazilian President Luiz Inácio Lula da Silva, Petrobras must buy as much as 70 per cent of its oil and gas equipment from domestic suppliers. The aim is to maximise the use of the Brazilian equipment and services industry capacity for the 2012-2016 procurement programme.

“Brazil has demanding local content rules but there is almost no yard capacity and there’s a shortage of welders. They haven’t had an oil industry on this scale before, so it’s obviously a massive step up and much rests on the shoulders of Petrobras,” says Samuel Ciszuk, an energy analyst at KBC Energy Economics.

Petrobras argues that some of these concerns are exaggerated. In its revised production strategy announced in June 2012, the company maintains that all its drilling rigs delivered in 2011 and 2012 have been constructed outside Brazil and had zero local content. For the 33 new domestic drilling rigs from 2016, the company estimates local content at between 55 to 65 per cent.

Nonetheless, there are concerns about bottlenecks. These centre on fears that some of the drilling equipment that is on order for 2015 has not been completed, so could face delays.

“It’s clear that Petrobras can do it,” says Ciszuk. “It has a lot of offshore expertise after all, but the scale of this may prove too much for the existing talent pool. The logistical burden of making sure everything is developed on time may prove too much.”

Petrobras CEO Foster’s focus on more realistic production targets and greater cost control to some extent reflect an acknowledgement of the scale of the challenge in meeting the company’s long-term goal of entering the world’s top five oil producers.

A tapering of the pace may therefore be in order as the pre-salt gradually comes into production. But few would bet against Brazil realising its target of vaulting up the league of major global oil producers over the next decade.

The pre-salt campaign is not going to be put off course by weaker oil prices. Despite bottlenecks and local content issues, the pre-salt is still very much a game changer both for Brazil itself and the global oil and gas market. “By now so much has been discovered that there is reason to believe even more could be found,” says Ciszuk. “They now have that critical mass so don’t need the highest prices in order to monetise it. And they will be able to reap the benefits of having developed the infrastructure in the first place.”

Petrobras’s massive pre-salt funding requirements may force it to farm out more acreage to foreign players



Image courtesy of Rolls-Royce

One of Petrobras’s floating production storage and offloading (FPSO) craft built to tap Brazil’s offshore pre-salt fields