

investment target it must compete with West Africa, where the deepwater exploration success rates run as high as 80% in some areas, and with the Gulf of Mexico (GOM), where discoveries are smaller but more frequent. There are compelling reasons why Brazil attracts high investments. The acreage of a Brazilian concession equals about 93 federal lease blocks in GOM. A GOM block might cover only a segment of a new field, but there's room for multiple fields offshore Brazil. Also, the upfront bid bonus paid for a Brazilian concession runs less than \$100/acre compared to top prices of \$250-\$350/acre in GOM, Nigeria and Angola. Furthermore, amounts being paid for concessions in Brazil are going down. The highest bonus of \$74.5 million was paid in Round 1, but that fell to \$64.6 million in Round 2, \$48.7 million in Round 3 and \$4 million in Round 4. Overall bonuses averaged \$15.75 million in Round 1, \$11.14 million in Round 2, \$6.13 million in Round 3 and \$2.14 million in Round 4.

Around 42 private companies are now participating in the Brazilian upstream sector. The initial excitement about entering this market, demonstrated by generous bids from international companies, has subsided, and a first wave of exploration under the Petrobras-managed joint venture blocks has proven relatively disappointing. However, a well-balanced array of supermajors, majors and independents is now gearing up for a steady stream of wildcat drilling. International investment in gas-to-power projects is also starting to pour in, despite lingering regulatory concerns about the country's electricity sector.

Petrobras was created by the Brazilian government in 1953, when the Brazilian government realized that to become self sufficient in oil and gas was a priority for the country. The first significant discoveries of oil and gas reservoirs occurred in the late 70s in the Campos basin, off the coast of the state of Rio de Janeiro. During the late 70s and the 80s, the country went through the worse economic crisis in its history. Its high trade deficit was largely due to its dependence on foreign oil. The government started to focus on producing oil inside the country. However, foreign capital for this purpose was not available at the time. The country was nearly bankrupt, and foreign banks were not willing to finance Petrobras' projects. On the other hand, the monopoly situation prevented foreign firms from investing in Brazil. Given the circumstances, Petrobras had no choice but exploit the country's mineral reservoirs with the limited resources that the company had available at the time. Necessity has generated a "can do it" mentality within the company's management.

Because over 70% of Brazil's recoverable hydrocarbons resources lie in deep and ultra deep waters, the Brazilian government encouraged investments in enabling its energy company to reach such vast resources. Petrobras discoveries in the Campos Basin justified heavy investments in technical studies and R&D projects to develop drilling techniques and production technology to bring this deep oil on stream. The intense deepwater activities that followed, with continuous exploration and production development, has kept Petrobras in a leadership position in deepwater technology and operational experience. In 2000, Petrobras had total reserves of 10.8 billion boe. Also in the same year, with the installation of 7 new deepwater floating production systems, Petrobras achieved production of 1.5 million boe per day.

Investments

Petrobras has developed a world-class offshore oil sector, but the state company could not have developed Brazil's immense resources alone. Petrobras' successes are also due to alliances that go beyond Brazil's borders. In fact, Petrobras, as the operator of most deepwater wells in Brazil, found such high-tech solutions through partnerships with service companies from Europe and the U.S. These partnerships allow Petrobras to combine its expertise, gained through its Research and Development Center (CENPES), with the experience of its partners in other parts of the world, like the North Sea and the GOM.

Although expenditures in Brazil as a percentage of total worldwide deepwater investment will decrease, from 30.2% in 2001 to 24.4% in 2004, investments will increase in dollar terms from \$3.5 billion in 2001 to 34.9% to 5.3 billion in 2004. Worldwide, deepwater investment will almost double: from \$11.5 in \$2001 to \$21.9 billion in 2004 (see chart at the end). Twenty-six companies worldwide have prospects totaling 20.7 billion boe waiting to be produced over the next five years, compared with 5.4 billion boe brought on stream by 13 companies in the last half-decade.

Petrobras has successfully developed several large hydrocarbon reserves found in deep water off Brazil's coast through sub-sea completions tied to floating production vessels. It is argued that if other companies had been allowed to operate in these waters, production technologies would have been different. Since Petrobras has been operating floating drilling rigs continually in the area, it can easily divert these rigs to intervene and work over subsea well completions on relatively short notice, with limited mobilization costs. Petrobras has been able to take advantage of this flexibility. Accordingly, other operators, having less access to drilling rigs, may prefer to develop fields with dry-tree options, such as tension-leg platforms and spars, which allow easier well intervention. According to Petrobras' sources, the company may consider other production options. Petrobras is not committed to either wet or dry completion solution alternatives in spite of its large experience with subsea completions; it will adopt the option that makes most sense financially.

Bid Rounds

Foreign companies first became involved in the Brazilian oil sector in 1997, through joint ventures with Petrobras. The first bidding round that allowed foreign companies to compete against Petrobras occurred in 1999. The blocks for offer in this round, which were extremely large (the average size of each area was 1,800 square miles, equivalent to 225 blocks in GOM), were sold to 10 foreign firms, as well as to Petrobras, which won five of the 12 blocs. Of the foreign firms, Italy's Agip won the most blocks, totaling four. Companies such as Unocal, Texaco, Amerada Hess, Repsol YPF, and ExxonMobil also made successful exploration bids, some acting in alliance with Petrobras. Most of the bids came for relatively unexplored but highly coveted areas in over 6,560 feet of water off Brazil's Atlantic coast. For example, BP Amoco had a winning bid of \$7.4 million for a large offshore block located 186 miles from the mouth of the Amazon River.

The second licensing round was concluded in June 2000. This round offered 23 blocks in nine sedimentary basins, including Campos (the Campos Basin is responsible for roughly 70% of the country's current total crude oil output), Amazonas, Camamu-Almada, Parana, Para-Maranhao, Potiguar, Reconcavo, Sergipe-Alagoas, and Santos. Unlike the first round, the second round included smaller blocks intended to appeal more to smaller oil companies. Contract changes also were designed to encourage smaller bidders, reducing capital requirements. The second round was hailed as more successful than anticipated, with Petrobras winning many bids in partnerships with foreign companies. While there was little participation from the majors, small and independent U.S., Canadian, European, and Brazilian companies' bids generated \$261 million for ANP, up more than 40% from the \$183 million in the first round. The Campos and Santos Basin blocks generated the most interest, receiving as many as four bids. Only two blocks received no bids.

Third bidding round in June 2001 offered 53 blocks, 43 of which are offshore, mostly in deep and ultra-deep water areas. Although about a third of the offered blocks received no bids, the round was considered a success because of the wide range of aggressive bidders. ANP earned \$250 million from the round, which attracted majors such as ExxonMobil, Royal Dutch/Shell, TotalFinaElf, and Statoil, as well as some smaller companies that were new to the Brazilian oil sector, such as U.S.-based Ocean Energy and Germany's Wintershall. As in the previous rounds, Petrobras was a big winner, winning as operator of 13 blocks and as joint venture

partner in two others (with operators ExxonMobil and TotalFinaElf). Companies that will work with Petrobras include El Paso, Enterprise, Statoil, and Brazil's Petrogal.

The fourth round offered 39 offshore and 15 onshore blocks. Eight blocks are in "frontier areas", and six are in the Campos Basin. The average block size is considerably larger than those in the third round. The round was launched in October 2001, and 35 companies met the May 2002 bid deadline. The auction was held in June 2002, with Petrobras once again the largest winner. Statoil, El Paso, and several other companies increased their investments in Brazil.

Overall, the ANP has been willing to attract smaller companies. The agency believes that such companies can help create a more dynamic, competitive and efficient environment for the petroleum industry in Brazil. While attracting investments to higher-risk basins, the ANP wants to prevent the major companies from establishing an oligopoly in the country. However, the ANP must significantly improve the investment climate to ensure significant investor interest in this round. Among the main issues is the uncertainty over whether state governments can charge extra taxes on the import of equipment for the oil industry, as well as the indefinite delays that companies face in attempting to obtain drilling licenses from Brazil's environmental agency (IBAMA), which is visibly unable to meet deadlines concerning workload created by risk contracts. As a result, several companies have not been able to complete the drilling programs stipulated in their contracts with the ANP. Brazil has been trying to address these problems, albeit tardily. The ANP and the Environment Ministry recently unveiled a new funding package that will triple the number of specialized IBAMA staff working on permits. It is worth mentioning that IBAMA rarely interfered with oil and gas operations during Petrobras' legal monopoly, which lasted until the Petroleum Law passed in 1997.

No company speaks of investing in the country without sounding a note of caution. Sharp criticism of the tax and royalties system made this year by ExxonMobil VP Jon Thompson may not have been an example of diplomacy, but his audience quietly agreed with his assessment that Brazil must do more to compete with other countries, especially considering that Brazil is offering smaller blocks and shifting to less-explored acreage. So far, however, the ANP has not contemplated a reduction in a 10% flat royalty. Fiscal reform is only contemplated within the context of wider efforts to modernize the tax system, a task for the country's Congress. Foreign companies also want to know whether the Brazilian government will extend tax relief on imported equipment beyond the temporary five-year period. Companies are worried because the tax relief is due to expire when many of them hope to be entering the field development phase.

Petrobras and Deepwater Development

Petrobras holds the record of the deepest producing well in the world. The development of deepwater oil and gas has two main historical phases: Phase I, the state monopoly by Petrobras from 1953 to 1997, and Phase II, the liberalization of the market with the Petroleum Law of 1997 to present. The main driving factors that contributed to the extraordinary development of deepwater exploration technology by Petrobras during Phase I were: national monopoly status of the company, trade deficit generated by oil imports necessitating local production, limited environmental accountability, access to the best engineers in the country, ownership of the local infrastructure and technology alliances with foreign companies.

During Phase I, Petrobras had the constitutionally guaranteed monopoly of all oil and gas activities in the country. The monopoly situation certainly helped Petrobras to become a worldwide leader in deepwater exploration technology, empowering the company through government support. However, this factor alone does not suffice to explain Petrobras' achievements, since other state-owned companies in different countries have not achieved the

same results. The monopoly situation becomes a driving factor when combined with the economic situation of Brazil starting in the late 70s, and the other factors listed above.

During the late 70s, Petrobras was more than a national monopoly; it was a symbol of pride and national identity. The company took advantage of its privileged position to conduct its research and development activities without too much regard to environmental or public safety concerns. Environmental regulations almost did not exist until the mid-90s in Brazil; the ones that actually existed were rarely enforced. Therefore, Petrobras enjoyed significant levels of “competitive advantage” with respect to other oil companies, to the extent that the national company could run environmental risks that other companies often could not afford in their own countries. Petrobras has been able to capitalize on such lack of accountability, conducting its operations with limited public safety constraints. Brazil has been plagued by recurring spills in recent months. Several smaller oil spills in the Campos Basin as well as a leak in an overland pipeline had been reported during the last year. Environmental concerns have acquired top priority in the company’s agenda. Critics in the industry attribute these environmental disasters to Petrobras’ lack of accountability.

Petrobras used its internal prestige and influence to hire the best engineers in the country. The company sponsors local universities, providing them with resources that are comparable to the resources of any industrialized country. Today, CENPES is one of the most advanced in the world, and the largest research center in Latin America.

During Phase II, Petrobras took advantage of its dominant position in the local infrastructure. The monopoly situation allowed Petrobras to own virtually all oil and gas related infrastructure in the country. In Phase II, competitors were forced to associate themselves with Petrobras in order to be able to use some of its infrastructure. This predominance situation gives Petrobras tremendous bargaining power when dealing with foreign and national private companies. Back in 1996, Petrobras held a monopoly over all branches of the oil and gas industry except distribution, and it was hard to see this changing without a major shift.

Petrobras Investments

Petrobras has investments in several international operations. The company is involved in West Africa, GOM (as non-operator), India (Joint Venture with ONGC for deepwater exploration off the Indian coast.) and Ukraine (Joint Venture with Ukrainian oil producer in deepwater project in the Black Sea). Petrobras sold last June its UK subsidiary to local independent Enterprise Oil for \$157 million, terminating the company’s presence in the North Sea.

The company’s international moves are the result of a comprehensive strategic review that led to a decision to focus upstream activities in areas where it can leverage its deep-water expertise, notably South America, the U.S. GOM and West Africa. The company’s strategic plans include an overseas production target of 300,000 boe per day by 2005, almost tripling the current production level. Non-Brazilian output currently accounts for 74,000 boe per day out of a total of 1.6 million boe per day. To achieve these goals, Petrobras has undertaken a number of steps, including a major reorganization, the adoption of a comprehensive strategic plan, a renewed emphasis on the development of international business opportunities, and an effort to develop new markets such as power and telecommunications.

The loss of its monopoly and the reinvention of itself as a commercially driven, disciplined company doing business internationally do not seem to be an indication that Petrobras is feeling under threat because of the entrance of foreign companies in Brazil. Considering the strength and critical mass it has built up, Petrobras dominance over the Brazilian energy industry means that the company is in a sufficiently powerful position to effectively hold back the deregulation process in Brazil.

As part of a strategy consisting of capitalizing on its core competencies, Petrobras is in the market to spend approximately \$3 billion on an oil company in the GOM. The company is receiving proposals from banks, and has been looking for a medium-sized oil company with a daily production of 100,000 boe per day. Among the candidates, a number of U.S. independents, including Ocean Energy, Pioneer Natural Resources and Noble. Brazilian newspaper Estado de Sao Paulo reported in September 2001 that Petrobras was in talks to buy Ocean Energy in a deal worth between \$2 billion and \$3 billion, but the deal never came to a closure. Ocean Energy appears to be an obvious target because it has assets offshore West Africa that interest Petrobras. The U.S. company also acquired offshore acreage with Petrobras at Brazil's third licensing round in mid-2001. However, the recent decline in U.S. natural gas prices has lengthened the list of large to medium U.S. independent producers that could be acquisition targets to the Brazilian company.

P-34 and P-36 Setbacks

In October 2002 the P-34 platform, a shuttle tanker transformed into a FPSO (Floating Production and Storage Offloading), experienced a major fault in the electrical system. A malfunction occurred in the main power supply and caused the platform to tilt. On November 2002 P-34 was righted and out of danger of sinking following a massive, three-day effort to pump seawater into the vessel's storage tanks to provide equalizing ballast, no oil leaked from the vessel during the ordeal. It has been estimated, however, that the company lost approximately US\$1 million a day in revenues due to the vessel's shutdown. The rig produces 34,000 barrels of oil per day and 195,000 cubic meters of gas from eight wells in the Barracuda field and two wells from the Caratinga field.

Petrobras suffered a significant loss and major criticisms from the media after its largest offshore platform (P-36) sunk in the Campos Basin on March 20, 2001. Explosions in one of its supporting pillars caused the accident. The rig had a production capacity of 180,000 bbl/d and was producing about 83,000 bbl/d from the Roncador field at the time of the accident. As a result of the accident, Petrobras has revised its production objectives for 2001, reducing from 1.42 million bbl/d to 1.39 million bbl/d. Estimates for production in 2002 have been similarly reduced. Early estimates indicated that other production was compensating for the loss of P-36, as four new wells (that came online in April 2001) helped April production exceed March production. A temporary replacement platform with a 90,000-bbl/d capacity was in place by September 2002. A tender for a permanent replacement is scheduled for 2004, to be in operation by 2007.

Sources:

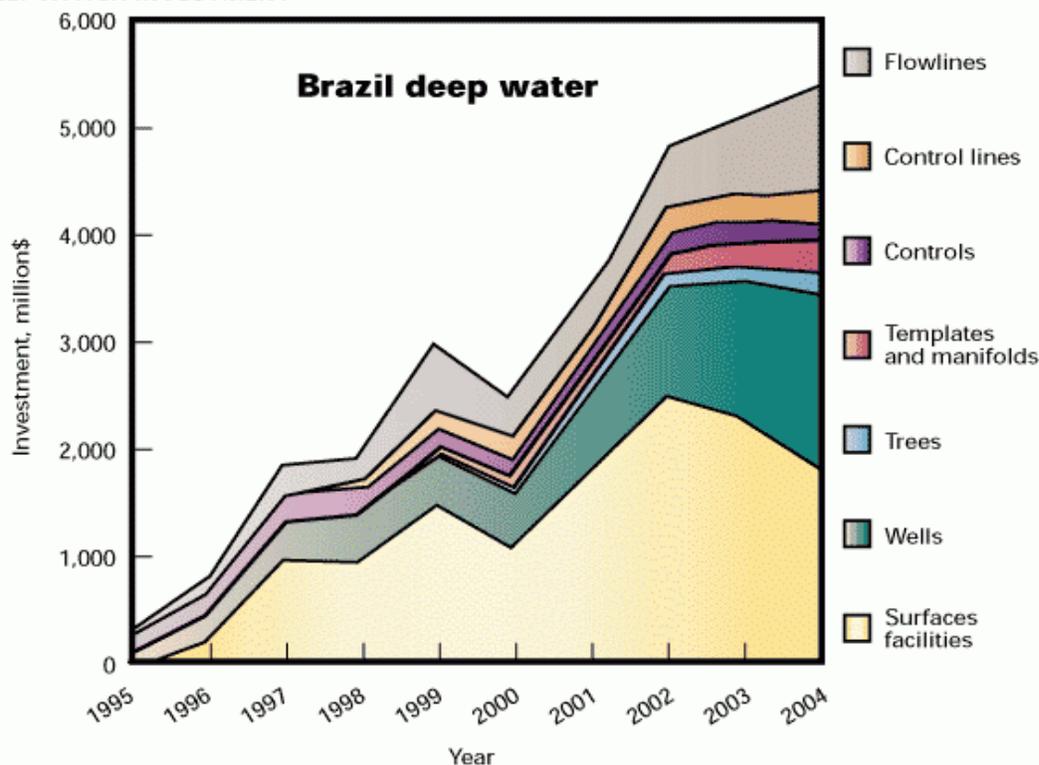
EIA Country Analysis Brief, <http://www.eia.doe.gov/emeu/cabs/brazil.html>

ANP web site, <http://www.anp.gov.br/>

ANP web site on bid rounds, <http://www.brasil-rounds.gov.br/>

The Oil & Gas Journal, various issues (searched via the web site, www.ogj.pennnet.com/home.cfm)

DEEPWATER INVESTMENT



Brazil

Item	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Surface facilities	0	250	1,000	1,000	1,500	1,100	1,800	2,500	2,300	1,800
Wells	189	290	391	466	494	504	703	983	1,210	1,607
Trees	33	46	56	59	78	80	92	114	137	163
Templates and manifolds	0	0	0	15	60	150	150	270	306	360
Controls	33	46	56	59	78	80	80	96	109	128
Control lines	17	23	79	64	192	200	200	240	272	320
Flowlines	45	157	307	275	596	400	450	600	748	960
Total	317	813	1,888	1,939	2,999	2,514	3,475	4,803	5,081	5,338

Worldwide

Year	Percent of total									
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
West Africa	0.0	0.0	3.8	0.6	6.1	10.0	16.4	21.4	23.7	25.0
Asia	5.9	9.5	4.9	1.3	0.0	0.0	6.9	2.6	4.3	6.7
Australasia	1.3	0.4	0.0	0.4	6.3	0.0	1.6	2.1	5.2	5.1
Europe	67.7	23.1	41.5	42.1	39.3	45.3	21.9	19.1	18.3	14.0
Brazil	9.3	24.3	30.2	27.1	25.5	30.8	30.2	33.3	24.9	24.4
Middle East	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.4
Gulf of Mexico	15.7	42.7	19.5	28.6	22.9	13.8	23.0	21.6	21.4	22.4
Total investment, million\$	3,395	3,349	6,243	7,163	11,759	8,152	11,488	14,413	20,411	21,919

Source: Douglas-Westwood