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Oil and Gas Report: BRAZIL

Since 1953, the Brazilian federal government has maintained a virtual monopoly in the exploration, drilling, production, transportation and refining of petroleum products. This monopoly, defined in the Constitution and scheduled for review when the newly-elected Congress takes office in October 1994, is exercised by Petrobras, the national oil company. Petrobras is a publicly traded company with the majority of its shares held by the federal government.

OIL AND GAS REPORT: BRAZIL

Areas that are not within the exclusive jurisdiction of Petrobras include the distribution of natural gas within individual states (state government responsibility), the refining of certain lubricants and oil for use in certain industries (state responsibility), and the retail distribution of gasoline, diesel and alcohol fuels (private responsibility).

Petrobras has traditionally pursued a "buy-Brazil" policy in its procurement of goods and services and, where possible, consulting and engineering capabilities. It sources approximately 85% of its requirements domestically. As a result, Brazil has developed strengths over a spectrum of oil and gas equipment and services, particularly in the area of deep water exploration, and has been active in exporting this technology abroad through Braspetro International.

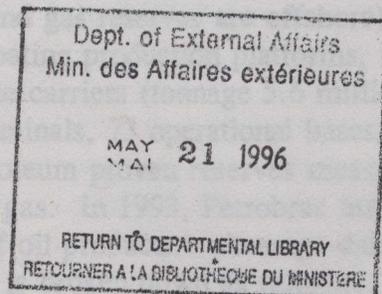
Current Situation:

Today, Petrobras is a company with assets of US\$ 50 billion. Its operations and assets currently include 250 oil and gas fields (majority of oil and gas fields are onshore and 12 offshore drilling rigs, 76 fixed and 15 floating), 10 refineries (average daily output 1.7 million bpd), 76 cracking units, 9723 km of pipelines (6125 km oil, 3597 km gas), 9 research centres (CENPES) and 55,000 employees. Petrobras produces 1.5 billion barrels of oil + condensate, and 137.4 billion cubic metres of gas on average 400,134 bpd of crude oil, and 388,000 bpd of natural gas production, at an overall BOE of US\$ 14.32 per barrel.

Oil	Onshore	182,345 barrels	Gas	Onshore	12.7 million m ³
	Offshore	453,993 barrels		Offshore	12.7 million m ³

In terms of drilling activity, Petrobras decreased its operations in 1992. US\$ 630 million was spent on 335 exploratory and development wells (US\$ 423 million offshore, US\$ 207 million onshore), down from 400 wells in 1991. Overall meters drilled, however, increased from 524,000 m in 1991. Detailed figures on wells drilled in 1992 show:

Onshore	Exploratory	51 wells	102,000 meters total
	Development	224 wells	421,000 meters total
Offshore	Exploratory	47 wells	156,000 meters total
	Development	34 wells	114,000 meters total



**Canadian Consulate General
Sao Paulo, Brazil
Tel: (011-55-11)287-2122
Fax: (011-55-11)251-5057**

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Oil and Gas Sector Brief: BRAZIL

Background:

Since 1953, the Brazilian federal government has maintained a virtual monopoly in the exploration, drilling, production, importation and refining of petroleum products. This monopoly, defined in the Constitution and scheduled for review when the newly-elected Congress takes office in October 1994, is exercised by Petrobras, the national oil company. Petrobras is a publicly traded company with the majority of its shares held by the federal government.

Areas that are not within the exclusive jurisdiction of Petrobras include the transport and distribution of natural gas within individual states (a state government responsibility), the refining of certain lubricants and oil by-products (private sector), and the retail distribution of gasoline, diesel and alcohol fuels (private sector).

Petrobras has traditionally pursued a "buy-Brazil" policy in its procurement of goods and services and, where possible, consulting and engineering capabilities. It sources approximately 85% of its requirements domestically. As a result, Brazil has developed strengths over a spectrum of oil and gas equipment and services, particularly in the area of deep water exploration, and has been active in exporting this technology abroad through Braspetro International.

Current Situation:

Today, Petrobras is a company with assets of US\$ 50 billion. Its operations and assets currently include 250 oil and gas fields (majority of oil and gas reserves are offshore), 14 onshore and 12 offshore drilling rigs, 76 fixed and 15 floating production platforms, 10 refineries (average daily output 1.2 million bpd), 76 crude carriers (tonnage 5.6 million dwt), 9723 km of pipelines (6126 km oil, 3597 km gas), 9 terminals, 73 operational bases, a research centre (CENPES) and 55,000 employees. Petroleum proven reserves measure 3.8 billion barrels of oil + condensate, and 137.4 billion m³ gas. In 1993, Petrobras imported on average 400,134 bpd of crude oil, and 388,000 bpd of oil products. Average daily production, at an overall BOE of US\$ 14.32 per barrel, is broken down as follows:

<u>Oil:</u>	Onshore	182,545 barrels	<u>Gas:</u>	Onshore	7.8 million m ³
	Offshore	458,993 barrels		Offshore	12.5 million m ³

In terms of drilling activity, Petrobras decreased its operations slightly in 1993 as compared to 1992. US\$ 630 million was spent on 356 exploratory and development wells in 1993 (US\$ 423 million offshore, US\$ 207 million onshore), down from US\$ 759 million on 385 wells in 1992. Overall meters drilled, however, increased from 521,000 m in 1992 to 554,000 m in 1993. Detailed figures on wells drilled in 1993 show:

<u>Onshore</u>	Exploratory	51 wells	102,000 meters total
	Development	224 wells	182,000 meters total
<u>Offshore</u>	Exploratory	47 wells	156,000 meters total
	Development	34 wells	114,000 meters total

Petrobras' investment budget for 1994 totals US\$ 2.9 billion, of which US\$ 1.12 billion is earmarked towards increased oil and gas production, and US\$ 680 million for exploration. This is a slight increase over the 1992 budget of \$US 2.3 billion, but remains far below previous allotments such as the 1988 budget of \$US 5 billion. Petrobras officials explain that the current government policy of setting diesel and fuel oil prices below cost, in order to fight inflation and stimulate economic activity, is largely to blame for the company's diminished financial resources. This is no doubt part of the answer. However, critics of the state monopoly in oil and gas, who will have their hearing in late 1994 when the Constitution is reviewed, argue that Petrobras inefficiencies and a swollen payroll are also to blame.

In several areas of oil and gas activity, Petrobras has developed world-class technology. This is particularly true in deep water exploration and production. Petrobras holds several world records in this area, including the deepest producing subsea well (781 meters) and the deepest exploratory well (1,027 meters). Both these wells are in the Marlim offshore field, which along with the Albacora field, holds great potential for future production. Petrobras engineers estimate that recoverable volumes of oil and gas in water depths between 1,000-2,000 m total 5 billion BOE. Marlim and Albacora are part of the Campos basin off Rio de Janeiro that accounts for 66% of Brazil's oil and gas production. Farther south, the Santos basin is composed predominantly of gas fields, while in north-east Brazil, new shallow water discoveries have been made in the Potiguar basin.

Opportunities:

In 1994, Petrobras will concentrate on increasing production of its offshore fields in order to lower imports and make use of under-utilized refining capacity. Bids were recently completed for the conversion of the Petrobras XXV, a GVA 4000 drilling rig, into a production platform. Plans call for the construction of 3-4 additional production platforms over the next two years. Petrobras will also give top priority to enhanced recovery techniques, reservoir engineering and advanced petrophysical & geological study methods. Due to the high viscosity of oil finds in the deep water Campos basin, technologies will have to be developed to adjust Petrobras' refining profile.

In terms of environmental and pollution control, Petrobras already has one of the lowest spill records of any major oil company. Interest exists for new clean-up technologies (bacterial, etc) as well as refinery pollution control devices.

Traditional suppliers to Petrobras have been the United States (35%), United Kingdom (15%), France (15%), Germany (10%), Norway (5%) and Japan (5%). There is, therefore, strong competition from abroad to supply goods and services not sourced domestically. This competition is heightened as several foreign suppliers, including France, Germany and Japan, have the support of state export agencies whereas Canada's Export Development Corporation (EDC) is currently off-cover for most projects in Brazil.

Opportunities for Canadian companies include deep water production technologies, pipeline engineering, testing, monitoring and inspection, SCADA systems, data interpretation software and services, process simulation software and services, and turnkey projects such as offshore production platforms. Potential Canadian exporters should note that all suppliers to Petrobras must be registered through the corporate headquarters in Brazil on an official "*approved-supplier's list*" (a two month process). This qualification process specifies that equipment must meet ISO 9000 standards. Petrobras does, however, accept documentation from the Canadian Standards Association (CSA) certifying ISO 9000 equivalency.

Opportunities in Natural Gas:

The Brazilian natural gas sector has expanded substantially in the last two years, particularly as there are efforts underway to promote gas for commercial and industrial applications. The state of Sao Paulo is currently carrying out a US\$ 98 million World Bank-funded gas distribution project aimed at expanding and improving gas distribution to industry and residences. Foreign companies are partnering with local firms to provide technology for this project as Brazil's experience with natural gas is limited. The Bolivia-Brazil Integrated Natural Gas Project is a US\$ 4.1 billion project comprised of exploration work in Bolivia, a 3,400 network of pipelines, 2000 MW of gas-fired power generation, industry conversion to co-generation, and distribution to residences. A supply contract has already been signed with Bolivia, but the control and funding of this project are still under discussion. In the natural gas sector, opportunities exist for distribution consulting services and technologies, compressors and turbines, conversion kits for vehicles, as well as the array of pipeline technologies and services and SCADA systems associated with a major transmission project.

Market Requirements:

Canadian companies approaching the Brazilian market should be prepared to confront stiff local and international competition. Sales are made only after concerted effort and several visits to the marketplace. The key to success is a good local partner or representative who best understands the particular conditions of doing business in Brazil. Increasingly, foreign companies are exploring the option of joint ventures and transfers of technology with local firms to solidify their presence in the market and, where manufacturing is involved, increase the local content and tariff preference of their product. The Canadian Consulate General in Sao Paulo would be pleased to provide references for potential agents or partners upon request, as well as more detailed product or market segment information.



Opportunities in Natural Gas
The natural gas sector has expanded significantly in the last few years, particularly in the industrial, power generation, and residential sectors. The expansion is driven by a combination of factors, including the need for energy security, the desire to reduce greenhouse gas emissions, and the availability of new technologies. In the industrial sector, natural gas is used for a wide range of applications, from heating and power generation to the production of chemicals and fertilizers. In the power generation sector, natural gas is used in gas turbines and combined cycle gas turbines (CCGTs), which are highly efficient and flexible. In the residential sector, natural gas is used for heating, hot water, and cooking. The expansion of the natural gas sector is expected to continue in the coming years, driven by the growing demand for energy and the need to reduce greenhouse gas emissions.

Opportunities exist for distribution companies and technology providers in the natural gas sector. Distribution companies are responsible for transporting natural gas from production sites to end users. This involves a complex network of pipelines, storage facilities, and distribution networks. Technology providers are developing new technologies to improve the efficiency and safety of natural gas distribution. These technologies include advanced monitoring and control systems, leak detection systems, and new materials for pipelines. The expansion of the natural gas sector is expected to create significant opportunities for distribution companies and technology providers.

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The expansion of the natural gas sector is expected to continue in the coming years, driven by the growing demand for energy and the need to reduce greenhouse gas emissions. This will create significant opportunities for distribution companies, technology providers, and other stakeholders in the natural gas sector.