# Pray to Stave Off Crisis

An energy crisis will hit Brazil in 2009 or 2010, and not even the discovery of vast undersea oil and gas reserves with "enormous potential yields," as announced by the government, can stave it off, warn experts.

The Tupi oilfield found in the Santos basin, off the coast of the southern state of Sao Paulo, could augment Brazil's proven reserves by 50 percent. At year-end 2006, national reserves stood at 13.8 billion barrels of crude, according to Brazilian oil giant Petrobras.

If these estimates are confirmed, Brazil would step up from 16th to 9th place among the world's oil producers, according to IPSNews.net.

"We will cease to be a middle-ranking country in terms of oil, struggling towards self-sufficiency in oil and gas, and become an exporting country, on a par with the Arabian states, Venezuela and others," said presidential chief of staff Dilma Rousseff.

But the discovery, according to experts consulted by IPS, will not mitigate short-term energy needs, nor will it avoid the coming energy supply crisis in this country of over 188 million people.

"It's a promise for the future, but it is real," said Adriano Pires, head of the Brazilian Infrastructure Centre, who estimates that it will take seven to ten years for the Tupi field to yield material results.

Pires attributes the future energy deficit to lack of planning and investment.

The economy began to grow at a rate of three to five percent per year, but "investments in energy development did not increase in proportion to economic growth," he said.

"Until 2010 we'll just have to pray for rain," he remarked. The country's main energy source at present is hydroelectric power, which depends on unpredictable factors such as the amount of rainfall.

**Brazil's new discovery will not mitigate short-term energy needs, nor will it avoid the coming energy supply crisis in this country of over 188 million people**

Nearly 84 percent of Brazil's total energy consumption is supplied by hydroelectric power. Other sources are natural gas (4.5 percent), biomass (4.3 percent), nuclear power (2.4 percent) and coal (two percent).

In early November, a prolonged drought affecting strategic parts of the country caused levels of water in hydroelectric dam reservoirs to fall. In order to compensate for the drop in hydropower output, Petrobras was forced to divert natural gas, imported from Bolivia, from the consumer market, to fuel thermo-electric generating stations.

In 2006, average natural gas consumption in Brazil stood at 41.79 million cubic meters a day. It is mainly used for industrial purposes, and to a lesser extent as fuel for cars.

Although the gas shortage was temporary--Petrobras was soon obliged to restore normal supply--Pires regards it as an early alarm of what is to come.

This is the beginning of an energy crisis "similar to, or much worse than" the one in 2001 which led former president Fernando Henrique Cardoso (1995-2003) to impose strict energy savings measures, he said.

As a short term solution, the vice president of the Postgraduate Engineering Centre at the Federal University of Rio de Janeiro, Aquilino Senra, said "a good agreement must be negotiated with Bolivian President Evo Morales, to increase imports of natural gas from that country."

Bolivia exports 30 million cubic meters of natural gas a day to Brazil, and 7.7 million cubic meters to Argentina.

Senra also proposed that on a short term basis, supplies of liquefied natural gas (LNG) could be imported from other countries, although he recognizes that it is much more expensive than natural gas.

And like Pires, Senra invoked the need for rain. "We'll have to cheer for the rains like a crowd of football fans, because if we have any more droughts the problem will be even worse," said Senra.

The energy crisis "is paradoxical in this country, which has the greatest hydroelectric potential in the world and the sixth largest reserves of the nuclear fuel, uranium, and is among the top 16 producers of crude oil," he said.

Senra also told IPS that the potential oil reserves in the Santos basin cannot solve the energy shortage in the short term, because it will take at least six years for production to come onstream.

According to Luiz Messias, project manager for the state company Electronuclear, if the continued construction of the Angra III nuclear power station, recently announced by the government of President Luiz Inacio Lula da Silva, had not been postponed, along with other projects of its kind, the crisis would have been averted.

The two operational nuclear reactors, Angra I and II, generate two percent of the country's electricity.

In an interview with IPS, Messias said that the main advantages of nuclear energy are its high capacity, its independence from unpredictable factors like rainfall, and its guaranteed operation at 86 percent of its maximum potential output.

# Pluses, Minuses For Russia in Gas Deal

Gazprom's plans to raise natural gas prices for Europe by at least 20 percent next year could generate more cash for a faster development of its giant Arctic fields, but could easily cast a shadow over future demand on the market.

Meanwhile, extra revenue could lead to pressure on the Kremlin to put off raising natural gas prices for domestic industry, as the country faces rising inflation during a sensitive election period, according to Iht.com.

Alexander Medvedev, deputy chief executive of Gazprom, told analysts late on Nov. 22 that the company's European customers would have to pay $300 to $400 per 1,000 cubic meters of natural gas next year.

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Gazprom, which supplies more than one-quarter of Europe's gas needs, links its prices to those for oil products with a lag of six to nine months. Oil prices have climbed above $90 for barrel in recent weeks, at times stopping just a hair's breadth short of $100.

Under long-term contracts that Western consumers have with Gazprom, they agree to pay for a certain preset amount of natural gas even if they actually take less. Demand will stay the same at least until 2015 because "so far nobody is building many coal and nuclear power stations" that take at least seven years to complete, said Jonathan Stern, director of gas research at Oxford Institute for Energy Studies. "The question is, 'Will it rise?' "

"It is possible that some countries will build nuclear stations and some countries will build coal stations, but we will not see the effect of it until 2015 at the very earliest," Stern said.

Production of energy from environmentally friendly renewable sources like solar and wind power could get a lift from the increase in natural gas prices, as they will need less or no subsidy from governments, Stern said.

Eurogas, a Brussels-based nonprofit group representing European gas companies, also warned that higher and more volatile gas prices would spell uncertainty for the fuel's longer-term demand.

"Only if natural gas can be supplied at competitive prices would it be in a position to expand its market share and its sales volumes at the expense of oil and coal," the Eurogas president, Domenico Dispenza, who is also chief operating officer at the gas and power division of the Italian energy company Eni, said at a natural gas industry conference in Moscow on Nov. 22.

**Gas-fired power stations, considered to be easy to construct and environmentally clean, account for one-fifth of the electricity produced across the EU**

Gas-fired power stations--considered to be easy to construct and environmentally clean--account for one-fifth of the electricity produced across the European Union. Environmental risks have been a major obstacle to getting permission to build coal and nuclear energy plants.

Antanta Pioglobal estimated that Gazprom would charge an average price of $320 per 1,000 cubic meters and earn $38 billion next year. Exports to EU will total 163.8 billion cubic meters, said Timur Khairulin, an analyst at the brokerage house in Moscow.

But amid concerns about rising inflation, fueled mainly by higher oil and food prices globally, the government could spoil the big picture for Gazprom by refusing to allow a planned 25 percent increase in regulated prices to Russian industry next year, analysts said. Gazprom currently loses money on such domestic supplies.

The government last year decided to gradually raise domestic prices for industry, essentially bringing them to parity with European prices by 2011.

"Fears of inflation have left this issue up in the air," said Konstantin Reznikov, an analyst at Dresdner Kleinwort in Moscow.

The inflation rate has consistently beaten official targets since September.

Oleg Popov, a spokesman for the Federal Tariff Service, said he was unaware of any plans to rethink the domestic pricing strategy for natural gas. He did not say when the service would make a decision, but last year the new prices were announced Dec. 5.

Gazprom's better financial footing next year could mean greater investment in its massive projects on the Yamal Peninsula in the Arctic, like the development of the Bovanenkovo field, Reznikov said. Gazprom plans to start production at the field in 2011 as part of an effort to replace dwindling production.

# Connecting Wind Farms for Cheap Power

Stanford University scientists have suggested that connecting wind farms can evolve a more reliable and cheaper power source.

According to Cristina Archer and Mark Jacobson, wind is the world's fastest growing electric energy source and can be groomed to become a steady and dependable generator of power, ANI reported.

Both say that the key lies in connecting wind farms throughout a given geographic area with transmission lines, thus combining the electric outputs of the farms into one powerful energy source.

"This study implies that, if interconnected wind is used on a large scale, a third or more of its energy can be used for reliable electric power, and the remaining intermittent portion can be used for transportation, allowing wind to solve energy, climate and air pollution problems simultaneously," said Archer, the study's lead author and a consulting assistant professor in Stanford's Department of Civil and Environmental Engineering and research associate in the Department of Global Ecology of the Carnegie Institution.

"The idea is that, while wind speed could be calm at a given location, it could be gusty at others. By linking these locations together we can smooth out the differences and substantially improve the overall performance," he adds.

Interconnecting multiple wind farms to a common point and then connecting that point to a far-away city reduces the cost of transmission.

In their study, which appears in the November issue of the American Meteorological Society's Journal of Applied Meteorology and Climatology, Archer and Jacobson, a professor of civil and environmental engineering at Stanford, evaluated 19 sites in the Midwestern United States, with annual average wind speeds greater than 6.9 meters per second at a height of 80 meters above ground, the hub height of modern wind turbines.

Modern turbines are 80-100 meters high, approximately the height of a 30-story building, and their blades are 70 meters long or more.

The researchers used hourly wind data, collected and quality-controlled by the National Weather Service, for the entire year of 2000 from the 19 sites. They found that an average of 33 percent and a maximum of 47 percent of yearly-averaged wind power from interconnected farms could be used as reliable, base-load electric power.

These percentages, they said, would hold true for any array of 10 or more wind farms, provided it met the minimum wind speed and turbine height criteria used in the study.

They said that another benefit of connecting multiple wind farms is reducing the total distance that all the power has to travel from the multiple points of origin to the destination point.

Interconnecting multiple wind farms to a common point and then connecting that point to a far-away city reduces the cost of transmission.

The more wind farms connected to the common point in the Midwest, the greater the reduction in long-distance transmission capacity that is possible, Archer said.

"Due to the high cost of long-distance transmission, a 20 percent reduction in transmission capacity with little delivered power loss would notably reduce the cost of wind energy," added Archer.

Archer said that if countries started to organize the siting and interconnection of new wind farms based on a master plan, the power supply could be smoothed out and transmission requirements could be educed, decreasing the cost of wind energy.

This could result in the large-scale market penetration of wind energy-already the most inexpensive clean renewable electric power source-which could contribute significantly to an eventual solution to global warming, as well as reducing deaths from urban air pollution.

However, because wind is intermittent, it is not used to supply base-load electric power today.

Base-load power is the amount of steady and reliable electric power that is constantly being produced, typically by power plants, regardless of the electricity demand.

But interconnecting wind farms with a transmission grid reduces the power swings caused by wind variability and makes a significant portion of it just as consistent a power source as a coal power plant.

# Climate Change No Priority for Indians

Most firms in India, one of the world's worst polluters, are yet to plan for the impact of climate change on their businesses, do not measure emissions or have deadlines to curb them, a study said on Nov. 23.

However, many Indian companies are aware of the commercial opportunities presented by global warming, according to the survey by the Carbon Disclosure Project (CDP), a global agency working towards a low-carbon economy, Reuters reported.

Only about a third of 110 top companies polled responded to the survey that sought information on opportunities and risks from climate change, emission levels and strategies to cut pollution, among other issues.

The CDP report said climate change would hurt some companies that did not respond and it was likely that many of them did not have risk-management strategies in place.

"An enormous amount of work still needs to be done by Indian companies to catch up with their global peers," said Paul Simpson, a senior CDP official.

"The survey findings provide a case for efforts towards awareness building and training on greenhouse gas accounting for Indian companies."

In contrast, more and more global corporations were providing for risks and opportunities presented by climate change and were factoring them while planning projects, he said.

Booming economies such as China and India have been criticized by the West for refusing to commit to emissions targets, despite being among the world's top polluters.

India contributes about 4 percent of global greenhouse gas emissions as its consumption of fossil fuels rises, but official estimates say it will still be below 5 percent of global emissions in 2020.

The per-capita emissions are expected to be lower than the average in developed countries.

The report said Indian firms were enthusiastic about business opportunities from climate change, including carbon trading and research and development of new products and technologies.

"This is indicative of Indian companies' appreciation of the commercial potential rather than the depth with which they have engaged with the climate change challenge," it said.

India has refused to commit to emissions targets, saying it must use more energy to lift its millions out of poverty. The government says this is something rich nations, which have burnt fossil fuels unhindered for over a century, should understand.

India's greenhouse gas emissions are largely accounted for by the power, steel, cement and chemicals sector.

New Delhi is working on a national plan to tackle global warming by the end of this year and Indian experts say the country has already achieved substantial energy efficiency.