

Energy debate heats up

A seminar on the energy sector in Brazil sponsored by the Brazilian Institute of Economics of the Getulio Vargas Foundation (IBRE-FGV) and *Conjuntura Econômica* magazine on March 28th and 29th in Rio de Janeiro produced brisk debates about the future of the sector.

Solange Monteiro, Kalinka Iaquinta and Thais Thimoteo, Rio de Janeiro

Today's projections for the growth of the Brazilian economy, projections for infrastructure investments, and a booming domestic market suggest that Brazil will be a very different country 10 years from now. For that to happen, however, one production component will be vital: energy. From exploration of deep sea oil to expansion of alternative sources of energy, the country must confront issues ranging from public policy to attracting investments while ensuring abundant energy to keep the economy moving.


Mauricio Tolmasquim


Altino Ventura


João Carlos Mello


Eduardo Chagas

Mauricio Tolmasquim, president, Energy Research Company (EPE), talked about the growing demand, commenting, "Even with an expected drop in the population growth rate — in the 1950s, it was 3% a year and has now gone down to between 0.5% and 1% — over the next four years we will acquire 6 million more inhabitants." And their quality of life will be much higher, which means more consumption, added Altino Ventura, secretary of energy planning and development, Ministry of Mines and Energy. "Per capita GDP will increase an estimated 3% a year and demand for electricity will increase about 4%," he said. Thus, by 2030 power generation in Brazil will have to double. The required investment will be heavy, but Brazil has a great advantage: clean electricity production mainly based on hydropower and an increase of new renewable sources of energy like wind, sugarcane biomass, and natural gas. Ventura noted that 41% of world electricity today is generated by coal, and China is adding 90,000 megawatts a year from new coal-fired plants.

João Carlos Mello, president, Andrade & Canellas Consultoria, was optimistic about attracting investment in Brazilian renewable energy projects because of buoyant demand, good rates of return, and cheap credit. Eduardo Chagas, manager of electric energy, National Bank for Economic and Social Development (BNDES), emphasized that BNDES is supporting energy production with increased participation in projects, longer repayment terms, and lower charges. "It shows that we are serious in the effort to keep electricity rates affordable, which is part of the tripod that guided the design of the electric sector; the other legs are security of supply to the National Interconnected System and the development of alternative sources," he said. From 2003 to 2010, BNDES supported 355 electrical projects, 225 of them for generation, which represented funding of R$74 billion. There are other signs of a sound environment: According to EPE's Tolmasquim, between 2010 and 2014 electricity generated for their own use by consumers (mainly large companies) will grow 5.6% annually, and the gain in electrical efficiency will be 12 TWh, equivalent to about 2% of projected demand for electricity in 2014.


Mozart Siqueira Campos Araujo


Nelson José Hübner Moreira


Reginaldo Almeida de Medeiros


Luiz Fernando Leone Viana

Tomalsquim believes this favorable scenario reflects a greater confidence in the energy system within a market where consumers are free to choose. He cited the energy auctions, which have guaranteed new electricity generation projects, as one example. "Today, 70% of what we need in the next 10 years is already contracted, and power plants are being built in Jirau, San Antonio, and Monte Belo," he said. "Energy is no longer a bottleneck. In 2011 and 2012, considering the surplus in the system, Brazil could grow 7% a year. "

Electricity rates and competitiveness

Yet other experts at the seminar had more critical views and suggested many course corrections to ensure that Brazil's energy agenda will be successful."We need to ensure financial rules, setting prices at auctions, and stable electricity rates," said Mozart Siqueira Campos Araujo, director, Brazilian Association for Clean Energy Generation. Another issue that will require intense debate is renewal of existing concessions, added Nelson José Hubner Moreira, director general, National Agency for Electrical Energy. Reginaldo Almeida de Medeiros, CEO, Brazilian Association of Energy Traders, added, "Now what is most important is to have principles to guide these discussions that promote equality between captive and free-market, speed in decision-making and legal certainty."

Currently, the free market already represents 27% of the national energy total, largely in long-term contracts. Luiz Fernando Leone Viana, president, Association of Independent Power Producers, spoke for incentives to enlarge the free market, arguing that competition is important to ensure balanced prices. He also pointed out that another concern related to generating more electricity is the unresolved controversy of environmental licenses, which have introduced considerable uncertainty about projects meeting deadlines.

While industry suppliers are concerned to generate electricity at competitive prices, both residential and commercial consumers are even more concerned about electricity rates being bearable. "Energy is a recurring theme for formulators of industrial policy, because it will be highly relevant to the composition of manufacturing costs in coming years," said Sergio Quintella, FGV vice president. Paulo Pedrosa, president, Brazilian Association of Large Industrial



Joísa Campanher



Sergio Quintella



Paulo Pedrosa

Energy and Free Consumers, argued that the energy debate should be guided not only by engineering vision but also by the logic of the economy. "Today, the energy debate is dominated by agents, investors, and producers in the energy sector itself, without reference to such items as efficiency and price," he said. "The economic signals are distorted, which brings about poor transparency and lack of competition. What's the result? The consumer is likely to assume the cost of public policies, absorbing inefficiencies by paying taxes."

Pedrosa displayed results from a study in partnership with FGV Projects finding that the taxes and charges on electricity rates in some cases account for half the cost, which reduces the competitiveness of Brazilian industry (see *The Brazilian Economy*, March 2011). To change this situation, he argued for the allocation of the energy of power plants whose concessions expire in coming years to all consumers, captive or free, at prices that reflect plant depreciation already paid; making social contributions non-cumulative at 3.65%; and getting rid of the consumption account of the development account and the global reversion reserve. "With these measures in this decade we could have real economic growth that is 1.2% higher," he said.



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Defense of nuclear energy

Tsunami damage to the nuclear complex Fukushima Daiichi in Japan set the tone for the lively panel discussion on nuclear energy. The big question was whether Brazil should maintain its nuclear program; in January Mines and Energy Minister Edison Lobão had announced plans for construction of four to eight new power plants.

"Our main mission is to show Brazilians how this energy is appropriate and how we can do it safely," argued Luis Felipe da Silva, advisor to the president, Nuclear Industries of Brazil. While all the panelists downplayed the risks of an accident in Brazil, they did not rule out the possibility that global security standards for nuclear power plants would be revised, which might raise costs. " I think there will be new requirements for licensing, but it is an energy that remains safe," summed up Antônio Müller, president, Association of Development of Nuclear Activity.

According to Leonam dos Santos Guimarães, assistant to the president, Eletronuclear, containment measures were being considered even before the tragedy in Japan, including possible installation of a small hydroelectric plant nearby exclusively to supply electricity in case of total loss of energy from a nuclear power plant. "We're checking up on capability to mitigate adverse events," he said.

Carlos Figueiredo, advisor to the commercial department, Nuclebrás Heavy Equipment, noted that Brazil and Japan use different nuclear-power-plant technologies. New plants in Brazil will use third-generation reactors, the cooling of which is independent of internal or external power. "For emergencies, these plants will incorporate passive safety systems, where there is no human intervention," he said.

Da Silva argued that the country needs to invest in producing the complete cycle of uranium; today, two of the five stages are handled in Europe. "We believe that by 2018 everything will be done here; we have already mastered the technology," he said.



Luis Felipe da Silva



Leonam Guimarães



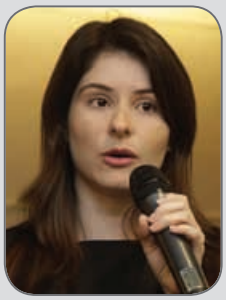
Antônio Müller



Carlos Figueiredo

Green energy


Odacir Klein


Nayana Rizzo

Ethanol and biodiesel, it was agreed, have taken a larger share of the Brazilian energy sector, and the market for them is growing. Biodiesel already constitutes 5% of diesel oil. According to Odacir Klein, president, Brazilian Biodiesel Union, the big goal now is to diversify the raw materials used — soybeans are now the largest biodiesel source.

Ethanol use has expanded remarkably due to the increased prevalence of flex cars that run on either ethanol or gasoline, "Brazil already consumes more ethanol than gasoline," said Nayana Rizzo, director of institutional relations, Union of the Sugarcane Industry (Unica). Now the industry hopes that more fuel will be generated from sugarcane. "At present, only 23% of sugar cane plants are selling electric energy," said Zilmar José de Souza, manager, Unica Bioelectricity. "With the current production of cane and with the retrofit of plants already installed, by 2014 we could generate 9,000 MW per year — one and a half times what the Belo Monte plant produces."

Sun and wind


Ary Vaz Pinto


Ricardo Simões


Marco Antonio Galdino

Experts cited two moments when the winds became favorable for development of wind energy in Brazil. The first, said Ary Vaz Pinto, head of special technologies, the Center for Electric Energy Research, was the Program of Incentives for Alternative Electricity Sources in 2002, which used guaranteed prices to encourage enterprises. "Then in 2004 came the concept of affordable tariffs, when subsidies were cut and the wind power sector had to prove it could be competitive."

The second pivotal moment was the economic crisis of 2008. Ricardo Simões, president, Association of Wind Energy, pointed out that the financial meltdown in developed countries has reduced demand, made equipment cheaper, and caused the Brazilian real to appreciate. But "these advantages in the international environment will not last, so we must work to make wind power more competitive."

Pinto thought the prices at energy auctions in 2009 and 2010 surprised the market, reaching R$123 per MW hour in 2010 and demonstrating the growth potential of wind power. It is estimated that in Brazil, at a reference height of 100 meters there would be electric generation potential of 300 GW, an immense value considering that wind generation projected for 2013 is just 5.25 GW. "We have everything in Brazil: tower manufacturers, components, consultants, and builders," Pinto said.

As for solar energy, Marco Antonio Galdino, regional representative, Association of Solar Energy, stated that its generation in Brazil is still limited, around 30 MW, mainly from the Light for All Program, which provides photovoltaic cells for households in remote regions. "World demand is good, with subsidies and incentives in countries like the United States, Japan, and Spain," Galdino noted, pointing out the potential of intelligent electric grids, where a solar-powered house can also provide energy to the grid for payment. Since Brazil is far from that point, Galdino said that the best strategy is to invest in technology. "We are the third largest producer of silicon [the main material in photovoltaic cells], but we export it impure," he said. "We should examine the feasibility of processing it here and develop cutting-edge technology for this market, which is growing."

Oil: The great treasury

The dynamism of the energy sector in Brazil is most evident in oil and gas, thanks to deep sea oil. Altino Ventura, energy expert of the Ministry of Mines and Energy, said that the country will in coming years transition from a small importer of energy to an exporter. "Today we import 5% of the total energy we need, from Itaipu, Bolivian gas and some coal," he said. "According to the 10-year plan for energy, we will soon produce 5 million barrels a day, and consumption is just 3 million a day."



Altino Ventura



Luiz Eduardo Dutra



Tuerte Amaral Rolim



Werner Grau

Tuerte Amaral Rolim, Petrobras executive manager of exploration and production, said that increased production — 7.1% a year in this decade, compared to 5% in 2002–2010 — will be a great opportunity for building various links in the supply chain. "This is a massive opportunity for Brazil's technological and scientific development," he said.

"Over the past 10 years the country has rebuilt the oil and gas sector; now we need to keep up the same pace and explore the new oil fields," said Luiz Eduardo Duque Dutra, chief of cabinet, National Oil, Natural Gas, and Biofuels. For Dutra, the priority now is to authorize the eleventh round of bidding for exploration of new fields. Of the many related challenges Armando Guedes Coelho, counselor, Federation of Industries of Rio de Janeiro, gave priority to financial issues, technology, and especially training skilled employees.

Werner Grau, partner, Pinheiro Neto Advogados, noted that deep sea oil will be subject to criticism as part of international discussions on climate change because it will increase the share of fossil fuels in Brazil's energy mix. His recommendation is to revive a bill allowing companies exploring deep sea oil to earn carbon credits to offset emissions by preserving a forest area.

Generating heat: Gas and coal

The gas potential associated with deep sea oil is a major driver for redefining the role of thermal plants in the Brazilian energy sector, experts told the audience. "We have to drop the idea that electricity supply can only be expanded by increasing hydroelectric power," said Xisto Vieira, president, Association of Thermoelectric Generators. Among the advantages of thermal generation, he said, are the speed of construction and the advantage of flexible location, with lower transmission cost. "Thermoelectric generation avoids transmission losses and can quickly adapt to sudden increases in electricity demand, which is important for ensuring that the electric system is reliable," he said.



Edmundo Alfredo Silva



Hermes Marques



Renato Costa



Fernando Luis Zancam



Tathiany Moreira



Wilson Yamaguchi

Currently, natural gas accounts for about 10% of the Brazilian energy matrix. Renato de Andrade Costa, Petrobras general manager of energy business, is optimistic about that percentage rising. "Thermoelectric generation can supplement hydroelectric generation. The latter has a high capital cost but a low variable cost, while thermoelectric power has a low investment cost and a high variable cost," he said. "So thermoelectric can function like insurance, to be used when hydroelectric reservoirs are low." Also, Costa suggests, "Maybe in the future we should have an auction just for gas, separate from wind and other sources, because they have different characteristics."

Tathiany Moreira, assistant director-general, National Agency for Petroleum, Natural Gas and Biofuels, praised the gas law passed late in 2010, calling it "a breakthrough for the industry because it strengthens the role of the regulator; it specifies new factors that the regulator can act on. The issue is to determine transport tariff and continue bidding the concession contracts and construction of new pipelines."

Despite the environmental impact of carbon dioxide emissions, representatives of the industry argued for the need to keep coal-fired generation in the Brazilian energy mix, and the benefits of doing so. Today, 90% of known reserves are in Rio Grande do Sul, of which 40% are in Candiota city, where earlier this year after more than 20 years of waiting the third coal-fired power plant began operating commercially. Hermes Marques, project manager, Eletrobras Thermal Generation of Electric Energy Company, considers this a special achievement because "This coal has low calorific value, which does not justify the cost of moving it; it should be used in the same region."

Fernando Luis Zancam, president, the Brazilian Coal Association, stated that throughout the world coal-fired generation should grow 90% by 2035, driven by Asian energy demand. He defended resumption of the search for new Brazilian reserves with an appropriate program of geology and highlighted technological advances that help coal-fired plants to pollute less. He pointed out that in Brazil emissions are mainly from land use and agriculture; electricity accounts for only 1.5%. Wilson Yamaguchi, manager of engineering for MPX, said that MPX's plans for expansion project include three coal-fired thermal plants. MPX, which has coal operations in Colombia and Rio Grande do Sul, plans to invest R$4 billion by 2012 in electricity production.