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NEWS BRIEFS

4 A new column offers bite-size reports of breaking news about what is happening in politics, business, and the economy in Brazil. This month: opposition parties promise to get tougher, Congress passes the minimum wage bill, and vehicle production and sales are surging.

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So far in her administration President Rousseff has concentrated on domestic matters and mainly left foreign policy to the bureaucrats — who, João Augusto de Castro Neves points out, are less at odds with each other than they were in the previous administration. But the president has taken a firm stance on human rights that is beginning to transform official rhetoric and has made well-received overtures to the U.S. and China.

VIEWPOINT

12 Budget dilemma: Cut expenditures or raise taxes?

Although stimulation of domestic demand by Brazil's economic team brought 8% growth in 2009 and 2010, it's time to put the house in order: The Rousseff administration will have to choose to discontinue some self-imposed policy goals or increase taxes. Both have implications not only for the current economic situation but also for the president's chances of re-election in four years.

COVER STORY

14 Electricity regulation needs to be recharged

By 2020 5% average annual growth should raise national GDP to US$5.4 trillion and per capita income to US$25,900, but it will also raise demand for electricity by 69%. Solange Monteiro explains how Brazil's growth could be even more spectacular if there were decisive changes in how the electricity sector operates, starting with a re-evaluation of the taxes and fees charged as part of the electric bill. The report is supplemented by concise analyses of the prospects for wind, biomass, natural gas, nuclear, and cogeneration electricity production.

23 Electricity concessions: Uncertainties may cause shocks

President Rousseff has important decisions to make before 2015: whether to extend concessions for about 31 gigawatts in electricity generation and contracts for transmission and distribution throughout the country. Extension, which is not currently authorized, would require sending a bill to Congress and issuing an interim decree. The alternative, under current rules, is for the concessions to revert to the federal government. Liliana Lavoratti analyzes the implications of each choice.

INTERVIEW

26 Designing markets in the real world

Professor Paul Milgrom of Stanford University has done groundbreaking theoretical work on how governments can use auctions to sell broadcast and mineral rights. He explains to João Manoel Pinho de Mello and Vinicius Carrasco how his theories apply in real situations, such as Brazil's sale of broadcast spectrum, and how governments can maximize the revenues they earn.

POLITICS

Senate approves minimum wage of R$545

In yet another easy win for the Rousseff administration, the Senate on February 23 approved the law to readjust the minimum wage to R$545, the amount advocated by the government and passed the previous week by the House of Representatives. Senators rejected an amendment to raise the minimum wage to R$600, which would have substantially increased public expenditure. The law gives the government the mandate to make adjustments to the minimum wage by decree until 2015. It now goes to the president for approval.

Opposition parties promise to get tougher

After spending the first three months of the Rousseff administration dealing with defeats in Congress and serious internal crises, the Democrats (DEM) and the Brazilian Social Democratic Party (PSDB) promise to move beyond "soft opposition" and become more critical of the government. Both will elect new leaders by May. The big problem for both opposition parties has been to heal the wounds caused by a third straight defeat in the presidential race. The PSDB has also had to manage the effects of the internal disagreement that led to the presidential candidacy of former São Paulo Governor José Serra rather than former Minas Gerais Governor Aécio Neves.

Senate approves creation of the Olympic Public Authority

The Senate has acted to create the Olympic Public Authority to organize the 2016 Olympic Games. President Rousseff has appointed former Central Bank President Henrique Meirelles to head the new agency.

FOREIGN POLICY



Foto: José Cruz/Agencia Brasil.

Minister Maria do Rosário condemned authoritarian regimes.

Human Rights Minister criticizes Middle East authoritarian regimes

Maria do Rosario, Brazil's Minister for Human Rights, has condemned authoritarian regimes of the Middle East and North Africa. Speaking at the opening of the 16th Session of the Council of Human Rights, the Minister referred to the wave of protests in the Arab world and said that no government should be sustained by force and violence; no government will last where there is social exclusion, unemployment, and poverty; and no people will bear in silence the violation of their fundamental rights. In an interview with the *Estado São Paulo* newspaper, Iran's foreign minister, Ali Akbar Salehi, conceded that "there may be conflicts in certain areas in the bilateral relationship between Iran and Brazil."

ECONOMY

Brazilian economy grows 7.5% in 2010, the largest increase in 24 years

Brazil's gross domestic product (GDP) grew 7.5% in 2010, the highest growth since 1986, according to the Brazilian Institute of Geography and Statistics (IBGE). GDP growth was mainly the result of 10.3% growth in domestic demand.

Vehicle production grows 18.7% in February

The National Association of Manufacturers (Anfavea) reports that 310,700 vehicles were produced in Brazil in February, an increase of 18.7% over January and 24.0% over February 2010.



Photo: Marcello Casl/Agencia Brasil.

Finance Minister Guido Mantega comments on GDP outcome in 2010.

Vehicle sales grew 12% in February

Sales of cars, light commercials, trucks, and buses in Brazil in February totaled 274,174 units, 12% more than in January and 24% more than in February 2010, according to the National Dealers Association (Fenabrave). Of these, 258,842 units were cars and light commercial vehicles, up 12.5% over January and 22.5% over the year earlier.

Official inflation slows to 0.80% in February

The IBGE has announced that inflation measured by the National Consumer Price Index (IPCA) was 0.80% in February, compared to 0.83% in January and 6% year-on-year, slowed in part by food and transportation. However, inflation in construction accelerated to 0.39%. Spending on education rose 5.81%, the highest in 10 years.

Inflows reached US$ 6.3 billion in February

February cash inflows were US$6.3 billion, according to new Central Bank data. Net capital inflows were US$7.2 billion, the net resulting from inflows of US$30.4 billion and outflows of US$23.2 billion. In contrast, net trade flows recorded a deficit of US$886 million (US$13.8 billion in exports and US$14.7 billion in imports).

BUSINESS

India and Brazil sign air services agreement

India and Brazil signed a bilateral air services agreement on March 8, which paves the way for increased and more convenient air travel between the two countries. According to the agreement, both countries would now be entitled to designate any number of airlines. The designated airlines of each side are entitled to operate 21 services a week in each direction with any type of aircraft not exceeding the capacity of B-747 aircraft.

ECONOMIC POLICY



Photo: Wilson Dias/Agencia Brasil.

Central Bank Governor Alexandre Tombini meets IMF Managing Director Dominique Strauss-Kahn.

IMF managing director says Brazil faces new challenges

IMF Managing Director Dominique Strauss-Kahn visited Brazil early March. He praised Brazil's resilience and skillful use of countercyclical policies during the economic crisis. However, he cautioned that it will be important to set an appropriate policy mix to contain inflationary pressures and ensure sustainable economic growth over the medium-term, while managing the challenges associated with large capital inflows.

R$50 billion to be cut in the federal budget

In late February, Ministers Guido Mantega (Finance) and Miriam Belchior (Planning) announced more details about a budget cut of R$50 billion (US$30 billion) in public spending this year. The government aims to make the cuts by targeting discretionary spending while preserving social programs and measures to boost growth. Ministries will have to cut discretionary spending by R$36 billion, of which R$18 billion in investments, and mandatory expenditure by R$15 billion, of which R$3.5 billion in payroll.

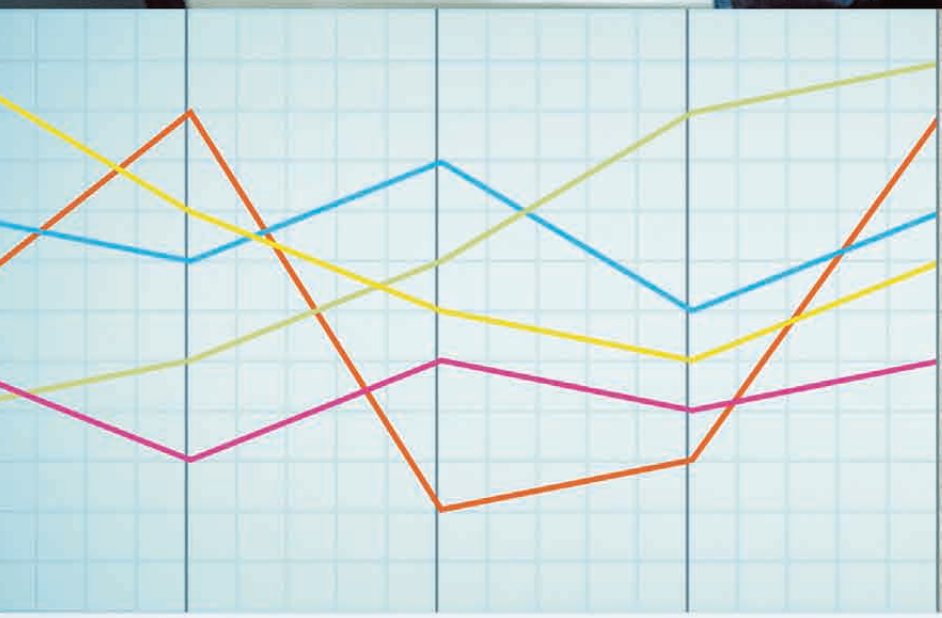
Central Bank raises rates by 50 basis points

As was widely expected, in its March meeting, the monetary policy committee in a unanimous decision again raised rates by 50 bps, bringing the benchmark rate to 11.75%, because inflation has moved closer to the upper limit of the bank's target range (2.5% to 6.5%).

Treasury will lend US$55 billion to BNDES

Finance Minister Guido Mantega has announced that the Treasury will lend US$55 billion to the National Bank for Economic and Social Development (BNDES) to extend the BNDES Investment Support Program. Mantega said increased investment is needed for sustainable growth. The BNDES today lends one and half times as much as the World Bank; last year, it provided US$96.3 billion in loans compared to World Bank lending of US$59 billion to member countries. However, experts disagree on how much impact BNDES has on economic growth. While some say it encourages private investment, others criticize the cost to taxpayers and the restrictions it imposes on monetary policy.





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Brazil needs to generate more electricity — and manage it better

In our excitement about the predictions for Brazil's economic growth over the next few years, let's not forget to shine a light on what might hold the country back — and one of the most obvious drags on the economy is the pace at which demand for electricity is outstripping supply. Yes, 5% projected growth by 2020 would almost double the growth recorded over the past decade, but so will demand for electricity. And to keep a national economy growing takes more than just plugging in a few more extension cords.

The government has committed to US$120 billion in investment in 70 gigawatts of generation capacity and installing 36,800 km of transmission lines, so it recognizes that there's a problem. But there's more to that problem than just infrastructure. The government has yet to recognize that in milking the electric power sector with fees and taxes, it may well be starving our future.

The situation in the aluminum industry illustrates how the present system is simply not working: Brazil has immense bauxite and alumina resources, yet since 1985 not a single new factory has been built; two have actually closed, reducing capacity by 10%; and for years annual production has stagnated at 1.5 million tons. A major factor is that electricity accounts for 35% of the total cost of production — an insane proportion.

It's not just the fact that at US$180 per megawatt hour Brazil's electricity rate is the world's third most expensive (after Italy and Slovakia). It's that the government pulls out a disproportionate amount in taxes and fees. A study by FGV Projects and the Brazilian Association of Major Power Consumers (Abrace) found that reducing or eliminating those charges could add 0.92% (US$318 billion) to GDP through 2020. But when the National Agency of Electrical Energy revised electricity rates for the third time, the rate of return on investment it proposed was below market expectations, which is no way is to encourage investment.

Rates, fees, and taxes aren't the only problem. The Belo Monte hydroelectric project was licensed more than a year ago, but it's still tied up in the courts. Professor Edmar de Almeida of the Group for Energy Economics at the Federal University of Rio de Janeiro expects this to happen over and over again until Brazil decides how much environmental impact we are prepared to accept. Licensing and start-up delays caused by environmental issues mean that investors have to go shopping in the energy market to meet supply contracts.

One option is to more actively promote alternative sources of power. Brazil is unusually well positioned for wind farms; its winds are not only strong but more consistent than in Europe. And wind farms can be sited to bring development benefits to remote regions. Exploitation of deep sea oil will also bring in huge reserves of natural gas. Biomass and nuclear generation are also options, as is cogeneration. Yet although industry is starting to embrace these options itself — 40% of aluminum producers have invested in cogeneration, and some other companies are finding it profitable to sell carbon credits — government commitment to the more green technologies seems at best half-hearted.

> It's time Brazil got serious about managing electric power properly — or about bracing ourselves for real economic trouble.

Moreover, in just four years (moments away in terms of power generation investments) concessions for about 31 gigawatts in electricity generation and contracts for transmission and distribution throughout the country will expire. The 10 transmission contracts alone cover 73,000 km. of lines — 82% of the entire total. Current law does not authorize extensions, so unless the administration acts quickly the concessions will revert to the federal government, and there would have to be an auction for new concessions. Meanwhile, the lack of clarity about what will happen in 2015 is both affecting day-to-day operations and inhibiting investment.

Foreign policy under Rousseff: Change or adjustment?

João Augusto de Castro Neves, Washington D.C.

Like previous administrations, in her first months in office President Rousseff focused primarily on domestic politics. As she deals with the demands of a broad governing coalition and tries to set up a secure legislative environment, she has left most foreign policy issues to the foreign ministry. Combined with Rousseff's much lower-profile style than her predecessor's, this has had the immediate impact of deflating what many perceived as Lula's overstretched diplomacy.

Compared to the beginning of the Lula administration, foreign policy today also seems less prone to internal disunity: A left-of-center troika of foreign minister Celso Amorim, deputy foreign minister Samuel Pinheiro Guimaraes, and international advisor Marco Aurelio Garcia muddled much of Lula's foreign policy decision-making. Today, under Rousseff's foreign minister, Antonio Patriota, decision-making is much more centralized. Although Garcia, a prominent member of the Workers' Party (PT) intelligentsia, kept his post as international advisor, his influence over the new president, at least on foreign policy issues, seems more contained.

Given Ms. Rousseff's leadership style and her focus on domestic issues, most of her initial foreign policy moves have been channeled through the diplomatic bureaucracy, which traditionally tends to be more risk-averse than other agencies or personalities that occasionally engage in foreign affairs.

But there has been one notable shift in Brazil's foreign policy: a new firmness in defense of human rights. Rousseff, who was herself persecuted by the military regime (1964–1985), set herself apart from President Lula when she directly criticized human rights violations by the Iranian government. Her statement paved the way for more transformations in official rhetoric. Recently, Foreign Minister Patriota suggested that Brazil might discontinue its efforts to try to influence negotiations on the Iranian nuclear program, distancing itself from Tehran, and the human rights secretary, Maria do Rosario, told the UN Human Rights Council that human rights are not negotiable.

Although it is too early to know if and how Rousseff's foreign policy will differ radically from

Lula's in the long run, two important issues on Brazil's diplomatic agenda may give us a glimpse of how much change or continuity lies ahead.

First, President Rousseff's favorable moves toward Washington (promise of an early state visit; her first international interview an exclusive to an American daily; her criticism of authoritarian regimes) have been well received. In return, President Obama will arrive in Brasilia in March willing to upgrade U.S.-Brazil engagement. It is not yet clear, however, how a more favorable environment will translate into cooperation. Energy cooperation (on biofuels, for example) and specific trade issues (agricultural subsidies) are topics that may evolve further, but there are clear limits to what both countries yet have to offer. No major trade deal is likely to emerge any time soon, and even the possibility of Brazil buying U.S.-made fighter jets will depend mainly on the complicated issue of technology transfer, something Obama alone cannot decide. One remote, but still possible, means of upgrading relations between the two countries would be a U.S. declaration of support for Brazil's bid for a permanent seat on the United Nations Security Council. But in general, while the Rousseff administration is willing to improve dialogue with the Obama administration on many issues, the U.S. has not much to offer in return beyond recognition of Brazil's emerging regional and global role.

Second, since 2010 China has become Brazil's main trading partner and an important source of foreign direct investment. What was perceived during much of the Lula administration as a mutually beneficial South-South interaction between two emerging countries, however, in fact has become, to China's advantage, a more asymmetrical North-South relationship. While about 80% of Brazil's exports to China are basic goods (soy, iron ore, and oil), over 90% of its imports from China are manufactured goods.

Although the trade surplus is favorable to Brazil (US$5 billion in 2010), another indicator has alarmed both policymakers and the private sector: According to the Brazilian Institute of Geography and Statistics (IBGE), the industry share of Brazil's GDP fell to 15.5% in 2009—the lowest figure since 1947. Driven by fear of deindustrialization, domestic pressure on the Rousseff administration to deal with China is escalating. President Rousseff is expected to visit Beijing in April.

Given Ms. Rousseff's leadership style and her focus on domestic issues, most of her initial foreign policy moves have been channeled through the diplomatic bureaucracy, which traditionally tends to be more risk-averse.

But there has been one notable shift in Brazil's foreign policy: a new firmness in defense of human rights.

Although it is clear that so far the government is seeking to adjust its foreign policy to a more solid stance, it is too soon to tell whether these changes are the result of a difference of beliefs between the president and her predecessor or simply reflect the calculated caution of an administration in its early days.

The proximity of these two presidential visits will most likely engender comparisons about the rapport Rousseff establishes with the leaders of the two global powers. When it comes to presidential diplomacy, symbolic gestures tend to be more revealing than accords.

Although it is clear that so far the government is seeking to adjust its foreign policy to a more solid stance, it is too soon to tell whether these changes are the result of a difference of beliefs between the president and her predecessor or simply reflect the calculated caution of an administration in its early days.

Brazilian foreign policy highlights, 1995–2010

1995	Mercosur becomes a customs union.
1996	The Commonwealth of Portuguese-speaking countries (CPLP) is created.
1998	Brazil ratifies the Nuclear Non Proliferation Treaty (NPT). Brazil brokers a peace accord between Peru and Ecuador.
1999	Mercosur launches trade negotiations with the European Union.
2000	The first Summit of South American heads of state meets in Brasilia, Brazil.
2003	Brazil and India establish the G20, an alliance of developing nations, at the WTO's Doha Round negotiations. The India-Brazil-South Africa Dialogue Forum (IBSA) is established to contribute to the construction of a new international architecture so that they can speak with one voice on global issues and deepen ties in various areas.
2004	Brazil leads the UN peacekeeping mission in Haiti. Brazil and China establish a mechanism for high-level strategic dialogue. Brazil launches the G4, along with India, Germany, and Japan, to engage in a collective bid for a permanent seat on the UN Security Council.
2005	The first Summit of South American and Arab Countries meets in Brasilia.
2007	Brazil and the U.S. sign an accord on cooperation on biofuels.
2008	12 South American countries create the Union of South American States (Unasur) and announce an intention to model the new community on the European Union, with a common currency, parliament, and passport.
2009	The first BRIC (Brazil, Russia, India and China) Summit meets in Yekaterinburg, Russia on June 16.
2010	The second BRIC Summit takes place in Brasilia, Brazil on April 16. Brazil and Turkey try unsuccessfully try to broker a deal between Iran and the UN Security Council. China becomes Brazil's main trading partner.
2003- 2010	During the Lula administration Brazil opened or re-opened 79 embassies or offices.



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FGV IBRE

Budget dilemma: Cut expenditures or raise taxes?

Lula's government ended with what was characterized as a typical and powerful political cycle in fiscal policy. Under the cover of countercyclical policy measures to combat the effects of global crisis, the economic team speeded up domestic demand in 2009 and 2010, bringing about robust growth of 8% in an election year. The result was triumphal popularity for Lula, and the election of his candidate Rousseff with relative ease.

Now it is time to put the house in order.

The Rousseff administration began by showing both determination and commitment to a fiscal tightening of R$50 billion and to maintaining the rule for adjusting the minimum wage, bringing it to R$545. The president clearly understands that the time to improve the economy's fundamentals is at the beginning of her administration, so that she can reap the fruits of popularity when she runs for re- election in 2014. With her demonstration of firmness, Rousseff seems less anxious about her current popularity in the present and more concerned about sustaining her political performance over four years in office.

Lula, an intuitive and impulsive politician, also carried out a great initial tightening in his first government. The situation, however, was somewhat different: the options before him in 2003 were a drastic economic policy adjustment or the abyss. Today Brazil is much more solid, and a restrictive policy at this early stage is much less an imperative than a cunning calculation that not all politicians would necessarily endorse.

The government probably will be able to deliver on cutting the budget by R$50 billion,



President Rousseff ponders difficult policy choices.

starting with R$18 billion in congressional amendments. Moreover, assuming that implementation of the Growth Acceleration Program (PAC) in 2011 is, as in 2010, again 60% of what was budgeted, R$15 billion will be saved. Finally, R$14 billion in cuts can be obtained by keeping operational expenditures — including health, education, and other discretionary spending — at the same level in real terms as in 2010.

However, the president will face a much tougher political battle sending to Congress a bill that, while not doing so explicitly, will in essence recreate the controversial Provisional Contribution on Financial Transactions (CPMF). Yet without tax increases, Rousseff will face an impossible policy trinity: a high primary surplus to ensure that interest rates fall, maintaining the rule for adjusting the minimum wage,

and sufficient public investment to provide minimally adequate infrastructure for the major sporting events that Brazil will soon host.

The Rousseff administration will have to choose to discontinue some self-imposed policy goals or increase taxes. The potential political costs in 2011 are perfectly manageable, and possibly more than offset by her high popularity in 2014, so Rousseff is likely to opt for an increase in taxes. Restoration of the CPMF is therefore emerging as the most viable alternative, though some analysts think a tax on mineral exports, and possibly other commodities, might also be considered.

If those predictions prove to be correct and international outlook stays relatively benign (no terribly catastrophic or too positive scenarios), it is possible to forecast the trajectory of the economy over the next two years. Economic growth is expected to slow to 3.5% to 4% to curb the inf ationary impulse generated by last year's election. The combination of a high central bank benchmark interest rate, fiscal adjustment, and increased bank reserve and capital requirements should be sufficient to bring inf ation closer to the target of 4.5% through 2012.

But in the second half of Rousseff administration, we can expect a slight acceleration of growth, ref ecting some fiscal loosening and reduction in interest rates. The minimum wage rule will lead to substantial real increases starting in 2012, and lower class welfare will continue to improve, though not necessarily at the same intensity as during the Lula administration.

With the economy accelerating and incomes rising for most of the population, Rousseff will be a tough candidate to beat in 2014. The president seems likely to display the coolness needed to go through the disinf ationary purgatory and a period of policy tightening before collecting votes in her probable re-election bid.

Without tax increases, Rousseff will face with an impossible policy trinity: a high primary surplus to ensure falling interest rates, maintenance of the rule for adjusting the minimum wage, and sufficient public investment to provide a minimally adequate infrastructure.

As far as the potential political costs in 2011 are perfectly manageable and possibly more than offset by her high popularity in 2014, Rousseff is likely to opt for a further increase in taxes.



ENERGY

ELECTRICITY REGULATIONS NEED TO BE RECHARGED

Solange Monteiro, Rio de Janeiro

Brazil's growth over the next decade will depend on ensuring more electric energy at more competitive rates.

This decade holds great promise for Brazil: the Brazilian Institute of Economics of Getulio Vargas Foundation (IBRE-FGV) says that 5% growth in gross domestic product (GDP) will by 2020 increase national GDP to US$5.4 trillion and raise per capita income to US$15,000. But increased industrial activity and residential consumption will also push up electricity demand by 69%. By 2020 the government therefore wants to add 70 GW in generation capacity and install 36,800 km of transmission lines, which will require a US$120 billion investment.

Yet although projected economic growth would be almost double the growth Brazil recorded during the past decade — and higher than is estimated for most European, Asian, and American countries — it could be even greater if there was a decisive change in how the electricity sector operates. For instance, electricity rates could be more competitive than they are if taxes and fees charged as part of the electric bill were cut.

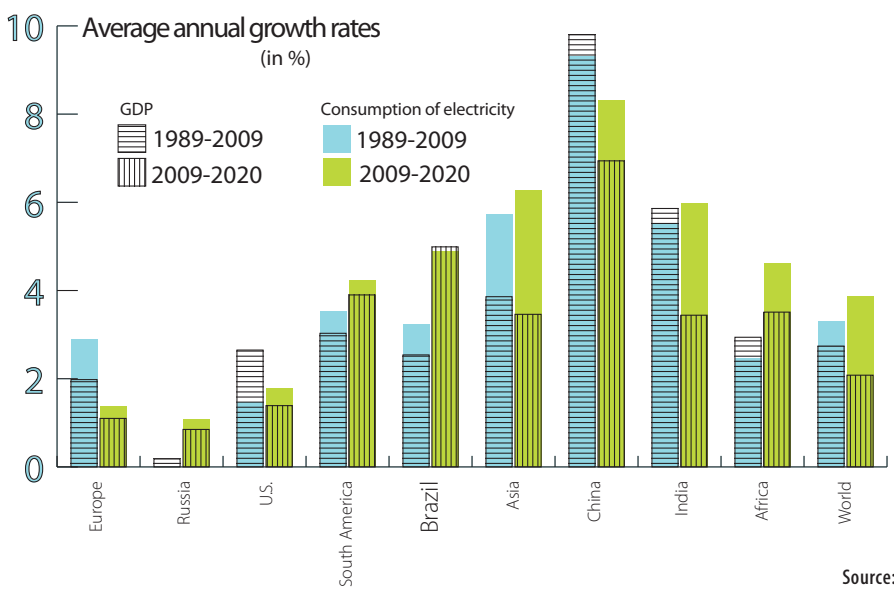
A study by FGV Projetos and the Brazilian Association of Major Power Consumers and Free Consumers (Abrace) found that reducing or eliminating such charges could add 0.92% to GDP through 2020 (US$318 billion). Also rising would be per capita income and exports, which could create four million jobs. For basic industries that depend on intensive use of electricity, such a revision means not just growth but survival itself, because today taxes and charges can represent up to half the costs of the energy they consume, undermining their competitiveness. "Failure to change current conditions could mean de-industrialization," says Fernando Garcia, a professor at the FGV School of Business Administration of Sao Paulo (EAESP) who was lead researcher on the project.

Thus, the planned new energy generation projects will not be enough to ensure a sustainable expansion if the Rousseff administration does not review the pricing of energy and consider modernizing the system.

THE GREAT EXPANSION

To reach production of 656,981 Twh by 2020, the government has signaled a willingness not just to unlock large hydroelectric projects but also to encourage energy diversification, taking full advantage of Brazil's potential for producing clean energy. Although there many questions about the means, analysts and industry players are unanimous in endorsing the goal: directing all efforts to meet the challenge of increased demand. "We have to double the supply that we

MORE GROWTH, MORE ELECTRIC POWER CONSUMPTION



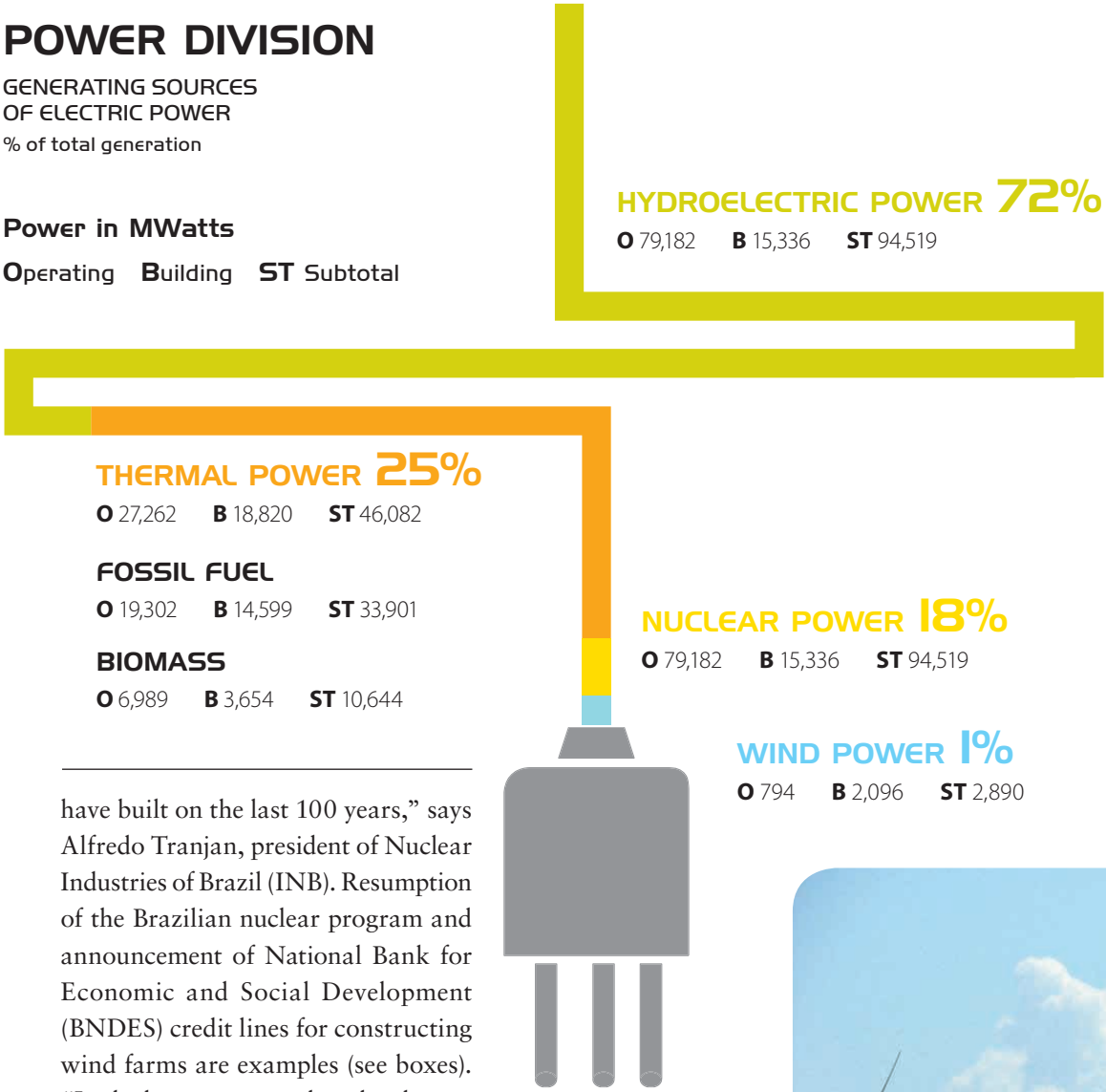
Source: FGV Projetos.

POWER DIVISION

GENERATING SOURCES
OF ELECTRIC POWER
% of total generation

Power in MWatts

Operating **B**uilding **ST** Subtotal



Sources: National Agency of Electric Energy (ANEEL) and Institute of Applied Economic Research (IPEA).

have built on the last 100 years," says Alfredo Tranjan, president of Nuclear Industries of Brazil (INB). Resumption of the Brazilian nuclear program and announcement of National Bank for Economic and Social Development (BNDES) credit lines for constructing wind farms are examples (see boxes). "In the last two years there has been a remarkable development of wind energy and cogeneration[1] with biogases — key initiatives [when] mega hydroelectric projects have become too costly," says José Goldemberg, a physicist at the Institute of Electrotechnics and Energy of the University of São Paulo (USP) and former São Paulo State Secretary of Environment. "We also need to make better use of natural gas, which we will have in abundance with the exploitation of deep sea oil; bring on line thermal power plants; and stimulate cogeneration with gas," says Adriano Pires, director of the Brazilian Center for Infrastructure (CBIE).



Even with the push for diversification, half the increase in power generation through 2020 is still concentrated in hydroelectric projects, mainly in Pará and Mato Grosso states. "I think the government is encouraging wind and nuclear energy to minimize resistance to the exploitation of the hydropower potential of the Amazon region; that's where you can keep electricity rates low," says Professor Edmar de Almeida of the Group for Energy Economics at the Federal University of Rio de Janeiro (UFRJ).

The most prominent, and controversial, project is Belo Monte on the Xingu River, which may become the last mega-hydroelectric project in the country; it will generate about 11 million MW. Although the environmental license was approved in February 2010, the government is still fighting legal injunctions that have prevented construction start-up. "Every big project ends up like this," José Antonio Muniz Lopes, then president of Eletrobrás, said last February. "What is overlooked is that, besides bringing benefits to Brazil as a whole, [Belo Monte] will benefit the region because it will pay US$2 billion in social and environmental compensation, which will ensure sustainable development there."

MULTIPLYING WIND

Increase in wind electric power

	GWatts	
2010	0,7	0,6 of total
2011	1,4	0,6 of total
2012	3,2	0,6 of total
2013	5,2	0,6 of total

Source: PSR Consultoria.

Favorable wind

Kalinka Iaquinta, Rio de Janeiro



Once considered expensive, today wind is already among the most competitive ways to generate electricity in Brazil: the average price in a recent auction was R$141 MWh, virtually the same as thermal plants (R$140 to R$150 MWh). "The price is behind only hydroelectric plants, which are still the cheapest source we have," says Mauricio Tolmasquim, president of the Empresa de Pesquisa Energetica (Company of Energy Research, EPE).

This has encouraged expansion. In 2003 Brazil had only 22 MW of wind power capacity. With the three auctions held in 2010, the number should rise to about 5,200 MW, according to Ricardo Simões, president of the Association of Wind Energy (ABEEólica). An EPE survey forecasts that by 2019 wind power production in Brazil will grow 320%.

Several factors have contributed to the increased attractiveness of wind energy. One is a change in the auction format, which since 2009 has adopted a contract for the band, leaving investors less vulnerable to wind uncertainty. "Before, when there was more wind, revenue increased, and when there was less, revenue declined, which could create a cash flow problem for investors paying down loans," Tolmasquim says. Now, instead of an annual volume requirement, a percentage is measured every four years. Tolmasquim points out, "When a wind park generates more, it's like inventorying wind — a credit to be used when it generates less."

Target — Changes in auctions, higher credit lines, an appreciated exchange rate, and the fall in U.S. and European demand for wind turbine equipment due to the economic crisis has made Brazil attractive to wind turbine investors and manufacturers. Richard Rose, director of the Department of Environment, Renewable Energy and Energy Efficiency of the Brazil-Germany Chamber of Commerce, believes that with more regular auctions Brazil's wind farms will increase considerably.

"Unlike Europe and the United States, where wind power was heavily subsidized, wind energy in Brazil is not a burden on the consumer or the Treasury," Tolmasquim says. Moreover, winds here are stronger than those that blow in the north. In Europe, the capacity factor — the ratio of power generation to installed capacity — is 25%–30%. In Brazil it is above 40%, since the winds here are not only stronger but also more consistent. "This means that with less capacity much more energy can be generated," says Simões, resulting in a lower cost per kilowatt-hour.

The potential is such that ABEEólica wants to create a Center for Research and Technology in Wind Energy and a field test for wind generators. "We want to discuss with the Ministry of Science and Technology where would be the best place for these facilities. The idea is that, as we already dominate in ethanol, we can dominate in wind power," Simões says.

Not only does expansion offer new job opportunities, Simões notes, he also recommends that wind farms be installed mainly in poor areas, as in the Northeast: "Since the royalties are paid directly to the owners of the land and wind farming does not interfere with other activities like livestock and agriculture, they help increase income and property values."

According to Professor Almeida, cases like Belo Monte are the result of two problems that Brazil must resolve: failure to define how much environmental impact we are prepared to accept, and a lack of political leadership and legal framework that leaves projects to the mercy of the courts.

THE TASK OF REDUCING TAXES

Moreover, "the electricity sector is old," says the CBIE's Pires. "In marketing, we still sell electric energy as being generated by large hydroelectric power plants. We need to change the rules to include new sources without increasing electricity rates." How to do this? Pires answers, "We have to stop thinking of the electric energy sector as a tax revenue resource and see it as fundamental for the country's development."

Today, according to the International Energy Agency (IEA), Brazil's electricity rate, US$180 per MWh, is the world's third most expensive, behind only Italy and Slovakia. Garcia, who has monitored electricity rates since 2002, confirms that rates are escalating, especially for industry: "To face the energy crisis in 2002, the government implemented rationing by price, which increased the cost for industry and decreased it

The future of natural gas

Kalinka Iaquinta, Rio de Janeiro

The discovery of deep sea oil, which contains natural gas, should stimulate Brazil to clearly define what role gas can play in electricity generation. Until now, natural gas was used only for reserve electric power to meet temporary demand peaks. "That model does not make it viable to produce gas to generate electricity," said Edmar de Almeida, member of the Economics of Energy Economics Institute, Federal University of Rio de Janeiro.

With the 2009 completion by Petrobras of liquefied natural gas (LNG) terminals the natural gas industry gained some flexibility. "Now," de Almeida says, "with the large volumes that will come from deep sea oil, the government will have to decide whether to export the gas or use it here, and the electric power sector is an interesting market."

Natural gas consumption in Brazil is very low. Ministry of Mines and Energy data show that in 2010 natural gas accounted for just 9% of the Brazilian energy matrix. Total gas demand was 79 million cubic meters per day, with sales for electricity generation accounting for 16 million cubic meters. The consultancy Gas Energy estimates that by 2020 the gas byproduct of deep sea oil will be 40 to 45 million cubic meters a day. (Gas from deep sea oil is considered "associated," i.e., it is merged in the oil.)

Currently, analysts say, the policy for pricing gas creates uncertainty for new investors. "What is needed is more auctions of gas that use 'take or pay' clauses. It is just a matter of pricing [gas] appropriately." says Xisto Vieira Filho, president of the Association of Thermoelectric Generators (Abraget). 'Take or pay clauses' state that the buyer must buy minimum amounts of gas for a previously agreed price.

Another concern is the lack of significant investment in infrastructure. The industry hopes that with the new Gas Law (Law 11909/2009, regulated by Decree no. 7.382/2010) this will be resolved. "Where, how, and when infrastructure will be built are not just decisions of Petrobras but also political decisions that involve the Ministries of Planning and Mines and Energy," says Sylvie D'Apote, partner and director of Gas Energy.

The Ten-Year Plan for Energy Expansion 2019 (PDE 2019) projects spending about R$15 billion for gas pipelines, LNG gasification terminals, and gas processing units.



for residential and rural consumers. But this policy has not meant financial gain for the producer — just more taxes."

Garcia points out that this has been a heavy constraint on many capital- and energy-intensive industries. Thus, the steel and heavy construction sectors could lose significant market share related to events like the World Cup, the Olympics, and deep sea oil.

Aluminum is a clear example. Brazil has the third largest reserves of bauxite in the world, the third largest production of alumina (aluminum hydroxide), and the sixth of aluminum metal. Brazil's producers should be unbeatable, but "since 1985, not a single new factory has been built in the country, and for years annual production has stagnated at 1.5 million tons," says Edward Spalding, energy coordinator of the Brazilian Aluminum Association (Abal). Why? Electricity accounts for 35% of the total cost of production. Spalding says that between 2001 and 2009, electricity costs for Abal members rose 189%, though inflation was only 87%.

To ensure a secure and reliable supply, about 40% of aluminum producers have invested in cogeneration. Albrás and Alumar, which together represent 58% of national production, in 2004 won at a public auction a 20-year cogeneration contract for energy at U$60 per MWh. "Still, worldwide," Spalding says, "the average for the sector is US$25–US$30 per MWh." He notes that for factories that must buy electricity from the network the situation has become impossible. In the past two years, two factories closed,

BRAZIL'S ELECTRICITY IS AMONG MOST EXPENSIVE.

Electricity rates
(US$/MWh)

Industrial **R**esidential

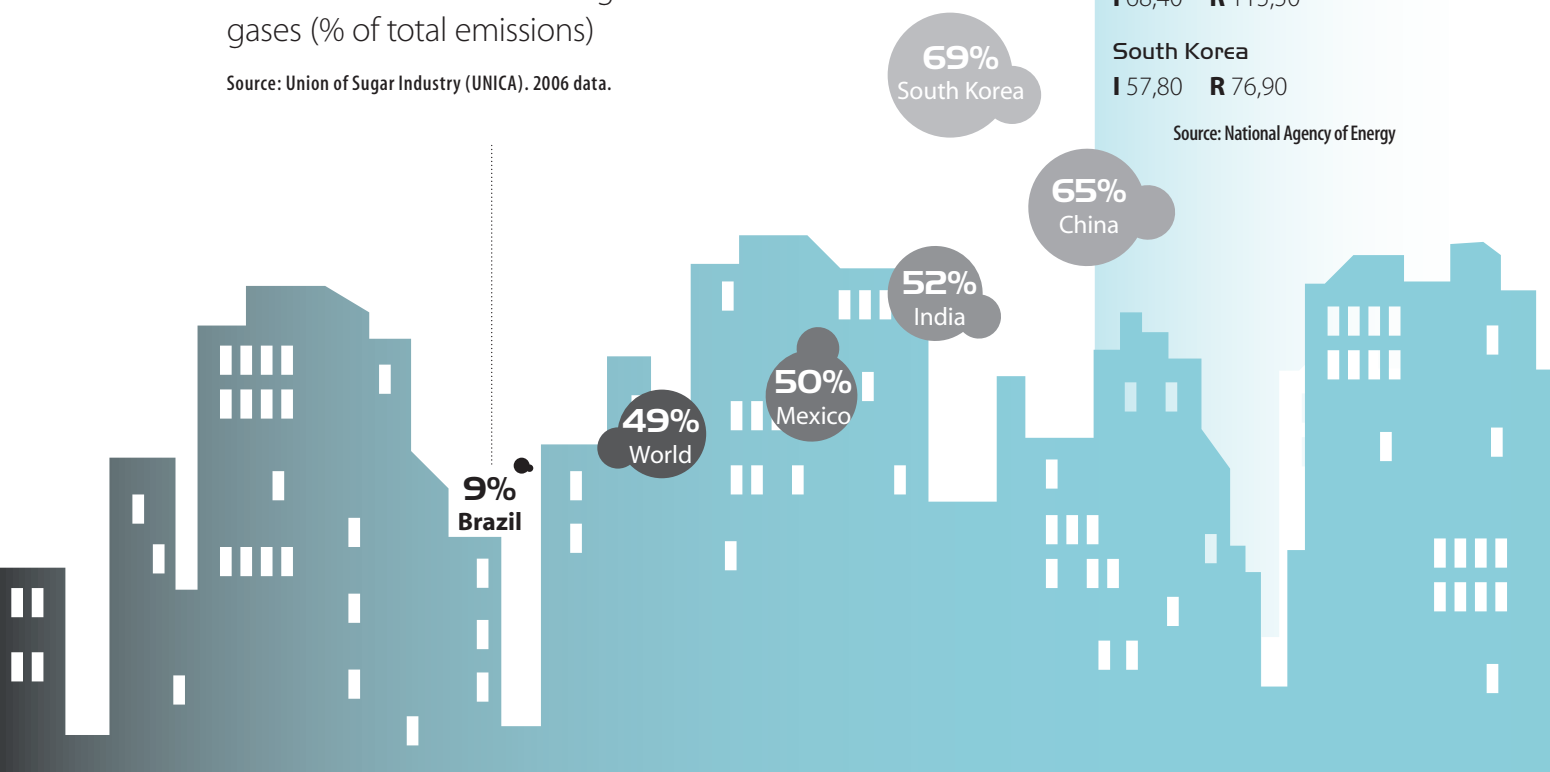
	I	R
Italy	276,10	284,20
Slovakia	194,80	230,90
Brazil	179,60	227,60
Japan	157,80	227,60
United Kingdom	135,00	206,00
Portugal	127,40	215,20
France	106,70	159,20
Mexico	84,60	78,60
China	74,50	88,00
United States	68,40	115,50
South Korea	57,80	76,90

Source: National Agency of Energy

BRAZIL: CLEAN ENERGY

Electric sector emissions of green house gases (% of total emissions)

Source: Union of Sugar Industry (UNICA). 2006 data.



By 2020, the government wants to add 70 GW to the country's electricity generation capacity and install 36,800 km of transmission lines, which will require an investment of US$120 billion.

reducing industry capacity by 10%, and imports of aluminum products in 2010 increased by 82% over 2009. Meanwhile, the government collects R$17 billion (US$10 billion) in annual taxes on industry energy bills.

Garcia points out the risk of de-industrialization if the current situation continues. "If that happens, we will not have a class of industrial workers with high enough wages to maintain growth," he says, citing the case of Detroit, symbol of the American auto industry, where unemployment and poverty surged as production declined.

"The temptation to collect more taxes will always be present, but it destroys more wealth than it generates," says Paulo Pedrosa, Abrace president. Based on the study with IBRE / FGV, Abrace argues that industry will become competitive only with a basic electricity rate of R$50 per MWh (US$29) compared with the current R$85 (US$50) from existing power plants, which are already paid for, and R$100 per MWh (US$59) from new plants. A substantial cut in electricity fees and taxes, the organization says, could reduce electricity rates by 22% to 27% for industry and up to 24% for residences.

Almeida believes that the debate on electricity rates is just beginning, and "I cannot see this government leaning toward a radical revision. Half of these taxes are sales taxes, which are an important source of government financing and therefore practically impossible to cut." The rest are subsidies to public programs to give the poor access to electric energy and reduce rates for consumers in isolated regions, which otherwise would pay three or four times more.

Power field

Solange Monteiro, Rio de Janeiro

Recent major changes in the sugar cane sector — the latest was the joint venture formed by state-owned Cosan S.A and Anglo–Dutch Shell that became Raizen — not only hold promise for ethanol to become a significant agricultural commodity but may also help diversify the Brazilian energy matrix. The sugar cane industry has the capacity to generate electricity equivalent to three hydroelectric power plants like Belo Monte. It also has two other advantages: Cane can be harvested in the dry season, supplementing hydroelectric generation, and its production is concentrated in the Southeast, where Brazilian consumption of electricity is highest, which suggests the possibility of reducing transmission costs.

According to Union of Sugarcane Industry (UNICA) estimates, by the 2020-2021 crop sugarcane biomass could fuel generation of 13,158 MW. If this potential is to be fully realized, however, industry representatives seek regular auctions of biomass energy to avoid the risk of derailing investments in both new plants and improvement of old plants to produce more efficiently. "Today, the sector can offer 500 MW a year, but we need a policy that guarantees annual contracting for alternative sources," says Zilmar Jose de Souza, UNICA bioelectricity advisor, who suggests that even in 2012, auctions are still uncertain.

A major challenge with biomass generation is the price. In the two auctions in 2010, the average price of biomass energy was R$134 per KWh; wind energy was R$123. The industry complains that the criteria adopted are a factor in this lack of competitiveness, and that government support for biomass and for wind is not balanced. "There were initiatives for wind energy in 2009 that produced good results, and lines of credit from Banco do Nordeste with low interest rates that we have never had for sugarcane and that would really help the industry. We also need this support," de Souza says.

To achieve a more competitive price, industry representatives advocate dividing the costs of connecting its energy to the network; today that is the total responsibility of the generator. "Currently, the cost of connecting is absorbed by the project; in remote rural areas, that may exceed 30% of the total investment," de Souza explains. "Ideally, it should be divided between the cogenerator and the system." The industry also seeks higher credit lines and a review of taxes.



Abrace argues that such subsidies should be included in the federal government budget. "Today, half those fees are used to secure the government's fiscal balance. It makes no sense," Pedrosa says. "It's time for this issue to be viewed in the light of economic logic."

SECTOR GIANTS

There is also a question of how industry can attract investments so that it can expand. "There is no lack of interest from private enterprise in entering the electricity generation business here," Almeida says. Rafael Andreatta, analyst for Planner Consultoria, agrees: "In recent auctions, interest was low because of government pressure for deadlines and low rates of return. ... But the generation sector in Brazil is highly recommended and there are hopes for new auctions."

This year, Eletrobras, the largest Brazilian utility company, is expected to accelerate its internationalization, mainly in South and Central America. By 2020 it intends to raise 10% of its revenue from abroad. Analysts point out that this strategy may represent a necessary diversification to make up for possible loss in profitability when some of its concessions expire in 2015.

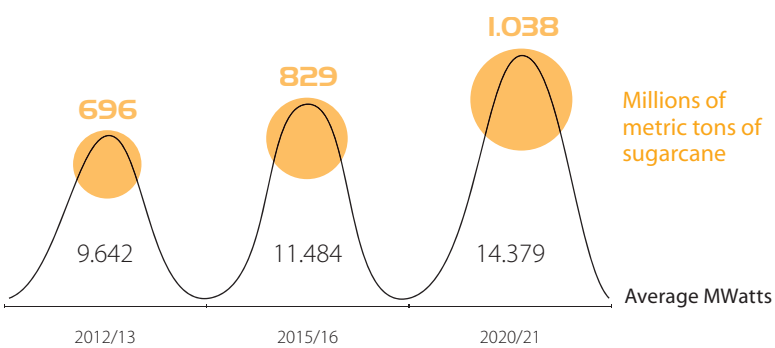
The possibility of profiting from economies of scale is also behind the drive for mergers and the emergence of new electrical giants. The merger of São Paulo Power Company (CPFL) and Neoenergia, pending approval by Spain's Iberdrola, will create a giant with revenues of R$26 billion. The Minas Gerais Energy Company (CEMIG) is said to be negotiating to buy Bandeirantes and ESCELSA. "As demand speeds up and [companies] have more cash than projects, such mergers will be normal," Almeida says. "Given the difficulty of getting new projects going, it can also be an easier way for companies to expand," he adds, noting that relative to economies

Today, according to the International Energy Agency (IEA), Brazil's electricity rate, US$180 per MWh, is the world's third most expensive, behind only Italy and Slovakia.



SUGARCANE ENERGY

Biomass electric generation



Source: Gesel/IE/UFRJ.

of similar size, concentration of industry in Brazil is still low.

Many stress that the country can no longer wait to clarify the rules. Andreatta says that licensing delays caused by environmental issues mean investors have to go shopping in the energy market to meet supply contracts.

And the third revision of electricity rates by the National Agency of Electrical Energy (Aneel) generated controversy because the rate of return on investments Aneel proposed was below market expectations. Almeida points out that in the U.S., "from which we imported the regulatory model," utilities regulators have been in operation more than 100 years. In Europe, the European Commission is above national agencies, creating policies to guide the process. In Brazil, the process for establishing rates is confused. "With each revision comes a new idea, and the methods change, creating uncertainty," Almeida says. "And uncertainty for the market could mean a blackout for private investment, just when Brazil needs a lot of power."

[1] Cogeneration (also known as combined heat and power, CHP) is the use of a heat engine or power station to generate simultaneously both electricity and useful heat.

The advantages of nuclear energy

Thais Thimoteo and **Solange Monteiro,** Rio de Janeiro

Reappointed Minister of Mines and Energy Edison Lobão is still interested in reviving the nuclear program of the Lula administration, in line with the worldwide trend for using this source of energy to produce clean electricity. He has announced plans to approve later this year construction of three or four plants besides Angra (which has a generation capacity of 1.4 GW and is scheduled for completion in 2015) and creation of a regulator for the sector. The National Energy Program envisions eight new nuclear plants by 2030.

Brazil should exploit an advantage that for years has been overlooked: with the United States and Russia, it is one of only three countries in the world that have both nuclear technology and uranium ore. According to Eletronuclear (the Eletrobrás nuclear power company), Brazil is sixth in uranium ore reserves. "We wouldn't need to prospect more, because we already have 310,000 tons — enough to meet the demand of Angra 1, 2, 3 and nine more nuclear plants throughout their useful life of 60 years," says Alfredo Tranjan Filho, president of Nuclear Industries of Brazil. "However, given geological similarities between Brazil, Canada, and Australia, Brazil may have reserves of 1.1 million tons of uranium, which would put us at the second or third largest reserves in the world," he says, suggesting resumption of prospecting, which would require investing an estimated R$130 million by 2016.

However, nuclear will not be a major source of electrical power any time soon. "Today, nuclear power is 2.5% of the total, and the goal is to double it by 2030," says Odair Gonçalves, president of the National Council of Nuclear Energy (CNEN). For critics of nuclear plants, "The risks and costs are very high, and funded with public money," says Dawid Barlet, director of the Heinrich Böll Stiftung; "Angra 3 is being built with technology that is outdated by international standards." He adds that "In addition, the CNEN was not clear where the atomic waste would be stored. The plan for a deposit must be completed in 2016. We then have another 14 years before this issue is perhaps resolved."

For Tranjan Filho, rather than think about the number of nuclear plants coming on stream in future, Brazil must focus on achieving control of the two phases of the fuel cycle that are still lacking — conversion and enrichment — so that it can eventually export nuclear fuel. "We are negotiating with companies that can sell us a conversion unit. If we buy that unit, we would spend R$460 million in 2018 to build two modules, enough to feed Angra 1, 2 and 3," he says.

Self-sufficiency in enrichment, he estimates, would require an investment of about R$1.9 billion. "A nuclear plant can cost R$3 billion, with just over R$2 billion full circle, so instead of building 11 plants, we could build ten plants and guarantee self-sufficiency, with capacity to export value-added enriched uranium," Tranjan Filho argues. But such a decision will be difficult for the government due to the high demand for electricity expected in coming years.





Electricity concessions: Uncertainties may cause shocks

Expiring concessions and inadequate regulation may stall the electricity sector.

Liliana Lavoratti, Rio de Janeiro

The debate over electricity concessions that will expire after 2015 indicates that Brazilian policy in this area is not yet consolidated. Besides doubts about capacity to supply more vigorous growth of the economy, competition for positions in major state utility companies, and blackouts in the Northeast and in big cities, there is acute uncertainty about what the federal government will do with the expiring contracts.

President Rousseff has important decisions to make before 2015: whether to extend concessions for about 31 gigawatts in electricity generation and contracts for transmission and distribution throughout the country.

Extension, which is not currently authorized, would require sending a bill to Congress and issuing an interim decree. The alternative, under current rules, is for the concessions to revert to the federal government, with compensation to current operators for investments made for which the costs have not yet been recovered, and then opening an auction for new concessions, says expert

"We believe the most pragmatic solution is extension [of the current concessions]. Although this is not the best solution for the economy, this government would not take the risk that assets belonging to state-owned enterprises would pass into the hands of the private sector."

ELENA LANDAU

Mario Roque Bonini of the Foundation for Administrative Development (Fundap).

Privatization

For Nelson Fonseca Leite, president of the Association of Electricity Distributors (Abradee), "This government, given its ideology, will not seek new bids, which would almost be privatization." Elena Landau, lawyer, economist, and consultant to the Brazilian Association of Electric Power Companies (ABCE), agrees: "We believe the most pragmatic solution is extension [of the current concessions]. Although it is not the best solution for the economy, this government would not take the risk that assets belonging to state-owned enterprises would pass into the hands of the private sector."

In any case, "If the government were interested in more concessions, promoting new companies in the market, allowing more competition, the process should have begun some time ago," says Cleveland Prates, professor of competition and regulation, Getulio Vargas Foundation of São Paulo, and partner and director, Economic Consulting Microanalysis. "The government may have left things as they are to consummate the continuity of concessions granted 20 years ago." He adds, "With its strong majority in Congress, it will not be difficult to get new rules adopted at breakneck speed."

Leite also thinks it more likely that the government will use renewal of the concessions to achieve reduction of energy prices for consumers or raise funds by charging operators for extension of the concessions. But he emphasizes that the energy distribution contracts provide for rate reviews every four or five years to incorporate operator productivity gains into final prices.

The Brazilian Association of Large Electricity Transmission Companies (Abrate) also thinks extension is "the safest way to protect consumers from possible power outages and provide stability to the electric power system," according to Cesar de Barros Pinto, Abrate chief executive. He points out that the law authorizes electricity transmission companies, unlike generators and distributors, to extend their current contracts. Currently 10 transmission contracts are expiring — the equivalent to 73,000 km of transmission lines (82% of the entire system).

Charles Lenzi, CEO of the Brazilian Association for Clean Energy Generation (Abragel), thinks the debate should focus not on whether the sector will remain largely in government hands but on ensuring that the regulatory framework stimulates private enterprise to carry out the necessary investments to definitively avert blackouts. Abragel also supports extension of concession terms but argues that any resources collected from the extension

should be invested in generating energy from renewable sources.

Conciliation

Regardless of whether the choice is extension or a new round of bids, what is important is a clear and enduring definition of policy, says Bonini. In addition to greater legal certainty, he says, "it is important to reconcile the goals of low tariffs and adequate and reliable expansion of energy supply." He acknowledges, however, that it is not easy to reconcile all these aspects given the complexity of the electricity sector and its generation, transmission, and distribution segments.

Companies that are already in the market are mainly state-owned, but other companies would like to participate. Prates adds that "Most disadvantaged in this story are consumers, who participate very little, given the complexity of the market. Unfortunately, they cannot even know whether or not the decisions made will make their electricity bill more expensive."

After profound changes over the past 15 years, the current model of the electricity industry is a hybrid. Unlike the state monopoly that prevailed until 1995, private enterprises are not heavily involved, but there is some competition.

According to Bonini, the federal government, which owns a controlling stake in companies that hold a large share of the maturing generation and transmission concessions, has an obvious interest in extending the concessions. States are also interested in that because they want to expand their utility companies, not privatize them. But private investors are divided: "There are those who wish to maintain the concessions, and there are potential investors that believe bidding is their only chance to enter the market," Bonini explains.

"Apart from greater legal certainty, it is important to reconcile the goals of low tariffs and adequate and reliable expansion of energy supply."

MARIO ROQUE BONINI

Until the government communicates a clear position on concessions, utilities will be very cautious about new projects.

CLEVELAND PRATES

Investments

The lack of clarity about what happens when the concession contracts expire in four years "directly affects day-to-day operations of the companies," as well as inhibiting investment, says Landau. "Nothing is known, starting with the rules for compensation if companies' assets [not yet paid back] revert to the government," she emphasizes. The compensation that would be required is estimated at several billion dollars.

Prates thinks that until the government communicates a clear position on the concessions, utilities will be very cautious about new projects. "Investments in the energy sector take many years to mature and require long-term planning, so you must have some idea of what will happen," he says.

Designing markets in the real world



Paul Milgrom
Professor at Stanford University

João Manoel Pinho de Mello and Vinicius Carrasco

Paul Milgrom has not only made remarkable academic contributions in the areas of auction theory, game theory, organization, and finance, he has also played a fundamental role in designing real-world markets, such as the U.S. auction of spectrum for cellular telephony, and has advised on bidding strategies in large auctions. Here Milgrom discusses the spectrum auctions in Brazil, rules for deep sea oil auctions, and the role of economic theory in the design of markets.

The Brazilian Economy **— How can economic theory help with design of real world markets, such as spectrum and on-line auctions? What are the main insights, advances, and recommendations we can learn, especially for public auctions?**

Paul Milgrom — Let's break the question into smaller chunks, focusing on one principle: making it cheap and easy for participants to achieve good results.

For online bidding, the principle implies eliminating the need to game the system to participate effectively. For example, advertising slots next to Internet search results are auctioned. In old systems, winning bidders needed to monitor the bidding constantly to adjust to how others were bidding. But the rules are now better informed by economic theory.

Foto: Crédito das fotos

Now winning bidders generally pay a price equaling the bid that would be just high enough to win even if the actual bid was higher. This means it is cheaper and easier for them to bid effectively.

For spectrum auctions, the situation is more nuanced. For instance, modern auctions allow established mobile phone companies that can expand coverage by purchasing spectrum in any of several bands to analyze their options when each band is sold separately in simultaneous ascending auctions. But a new entrant may have different needs. A big entrant may want to achieve efficient scale and national scope, which is hard if spectrum must be acquired piece by piece. So, the rules that work best depend on both the context and the regulator's goals.

You are well known for having devised the simultaneous auction rules that many countries have used to generate hundreds of billions from radio spectrum sales. What are the main features of those rules? And what was your role in the design?

Robert Wilson and I devised the system in 1993 and the U.S. first used it in 1994. It was inspired by a common type of charity auction, the "silent auction," in which many items are sold at the same time in the same room in ascending bids but with no auctioneer or outcry. Bids are recorded on a piece of paper related to the item being sold. Because there is a fixed ending time, bidders often game the system by waiting to bid until just seconds before the close, hoping to get a low price.

Our design makes two changes. First: the auction does not end until there is a period with no new bids. That way, nobody can sneak in a bid and hope to prevent a competitor from responding. Second, the "activity rule" I invented is now widely used. In its simplest version, no bidder can increase its activity during the auction. So, for example, to be eligible to win 10 items, a bidder has to be the standing high bidder or actively placing bids for them in every period during the auction. This rule ensured that bidders could know the amount of demand and adjust their plans accordingly, so it helps make it easy for bidders to participate effectively.

How do the rules for simultaneous ascending auctions (SAA) differ from what Brazil has done so far? Are the SAA rules still state-of-the-art?

The last auction in Brazil sold licenses for different areas in sequence rather than all together in an SAA. That makes it harder for a bidder on a fixed budget to buy multiple licenses because it does not know how much to set aside for later licenses when it bids on earlier ones.

Now there are more choices of good auctions, all of which have advantages and disadvantages. For example, if some bidders want to enter a mobile telephone market, they may need sufficient scale to make buying licenses worthwhile. The

Now there are more choices of good auctions, all of which have advantages and disadvantages.

SAA makes it hard for them because they need to bid without knowing how many they will eventually win.

New "combinatorial" auctions make that easier. One key idea is that a bidder who only wants a package of items, for example five spectrum licenses, should be allowed to bid on just that. Several European countries have adopted the model, which I introduced in academic publications.

The first goal of a good [auction] design should be to encourage a market structure that provides useful services for consumers. With that goal in mind the government should decide how many licenses to offer and how much spectrum to allocate to each.

Recently, I invented a new multi-product sealed-bid auction to compete with the SAA. Sealed bids accomplish much the same thing but much faster and more cheaply.

How different can the rules be for different auctions? Do the elements for successful design depend on the objectives (revenue, efficiency) of the designer? What kind of trade-offs must be taken into account?

Items can be auctioned one at a time or simultaneously. They can be sold with bids on an individual item or on packages, or bidders might bid a maximum price per package and an overall maximum budget. Many kinds of bids are possible.

The rules can call for a single round of sealed bids or multiple rounds of an ascending auction in which bidders can be either informed about all previous bids or given more limited information. The round-to-round bid increments can be determined in various ways. Prices can be called by the auctioneer, or by the bidders themselves. There may be a fixed ending time or an ending when a certain condition is met. Starting prices and reserve prices can be determined in a variety of ways.

There are many more decisions, too: Will there be limits on what bidders can buy? Are only cash bids allowed? Will the seller finance bids? What is being sold? Will the government impose build-out requirements? Or require service across an entire nation? The questions go on and on.

A successful design naturally depends on how success is defined. Sometimes, a government wants to encourage, say, rapid development of the industry, wide roll-out of services, or participation by small businesses. If the government cared only about revenue, it might limit the amount of spectrum for sale, creating more intense competition. Or it might divide the spectrum into big chunks so that bidders find it hard to coordinate to share what is available. There are other kinds of trade-offs, too. We like auctions to be as simple as possible so that the public can be sure there

Foto: Credito das fotos

are no shenanigans. But we need to add features to accomplish certain objectives, like deterring collusion or advantaging weaker bidders.

In the last spectrum auction in Brazil, 5 bidders[1] bid on some 90Mhz of spectrum. For each local market licenses were auctioned sequentially. Is this a good design for maximizing revenues? How about for increasing the odds that an entrant can win enough licenses to be a viable competitor?

The first goal of a good design should be to encourage a market structure that provides useful services for consumers. With that goal in mind the government should decide how many licenses to offer and how much spectrum to allocate to each. That is the single most important decision.

Next, a major step in designing a successful auction is getting to know the bidders and their needs. To encourage entry into the wireless communications business, the designer might offer an entrant the chance to bid for what it needs all at once rather than forcing it to bid for one license at a time. If the entrant can succeed just by entering in big cities, the best sequenced auction would have bidding on those cities first, so that the entrant can decide which licenses to bid for. Evaluating what the government did depends on a detailed knowledge of the particulars.

Equally important is avoiding collusion, which keeps prices low in many poorly run auctions. Selling items in sequence, as in Brazil, is not especially vulnerable to collusion, so that part of the rules passes muster.

In 2011 band H spectrum will be auctioned. The government wants to suppress auction competition to guarantee product competition. Is that a good idea? Or can we have both? How can we balance desirable aims?

There is established economic analysis showing that incumbents have an advantage in auctions even if they are less efficient than new competitors because they can count on higher profits from market concentration. The whole point of entry from the government's perspective is to make the market more competitive, which makes it less profitable for entrants.

The government has two main options: First, set aside some spectrum for entrants, which I understand will be done for band H. The second, which trades off competition in the auction for competition in the retail market, allows entrants a discount when they acquire spectrum. For example, an entrant might only be required

The auction consultant asks about a range of circumstances surrounding the auction, its goals, the amounts at stake, the risks of collusion and coordination among bidders, and so on.

to pay 75% of its bids if it wins. That encourages entrants and still allows active competition in the auction. But it's necessary to get the discount right.

The Brazilian government will auction off the right to explore deep sea oil blocks worth billions of dollars. Can economic theory contribute to design of those rules and bidding options for entrants?

Absolutely! The starting point is to analyze the industry and the government's goals. Who are the potential bidders? Does the government want a long-term revenue stream or a big initial cash payment? How important will follow-on auctions be, and how might the industry structure affect revenues from them?

To get a high price, it is also important to make sure that weaker bidders are not too disadvantaged. What do they want to buy? Is it easy for them to bid for that?

I have been working on some new ideas about how to encourage bidders with limited budgets. The idea is to allow them to express maximum bids for individual properties plus a maximum overall budget and to take both into account in awarding mineral rights.

The Brazilian government will cede rights to Petrobras (Brazilian state oil company) of deep sea blocks that adjoin existing Petrobras blocks because Petrobras has "better information on the viability of these blocks." Is that a good idea?

This appears to be a classic example of the "winner's curse." It also describes a situation in which the auctioneer does best by distinguishing between weak and strong bidders. The winner's curse works like this: if one bidder — say Petrobras — is much better informed than others and a less-informed bidder wins the auction, that bidder is cursed: the rights probably aren't worth much — because if they were, Petrobras would have bid aggressively to win.

One simple way to deal with the winner's curse is to exclude the well-informed bidder. Whether that is a good idea requires careful analysis. For example, Petrobras might distort the outcome anyway, by selling or trading its information. Another issue is the number of other bidders. And there may be ways to mitigate the winner's curse that are less costly than excluding Petrobras.

Should the Brazilian government auction off all deep sea blocks at once, or do it sequentially?

By sequentially, you mean over a period of years. Often, for large finds, that's the best strategy, because exploration and development takes years anyway. But there is far too much money at stake to answer a question like this casually. In large auctions, the economic analysis looks at all the

For an auction [of signing oil bonuses] to work well, the details really matter. Many things can go wrong.

options, sees who the bidders might be and how that might change over time, looks at regulatory and political constraints, and then formulates feasible choices.

Until now, bidders in oil auctions bid on signing bonuses — fixed amounts for the right to explore the block. Now they bid on equity — the share they want to retain from future oil development. What are the advantages and disadvantages of each?

For an auction like this to work well, the details really matter. Many things can go wrong. First, because payments are not due until the future, there is a risk that the terms might be renegotiated, or that a bidder might default. The auction needs to account for that. Second, the equity share needs to be based on something easy to measure, so that the government is not exploited by accounting tricks. Third, if net revenues are the basis of payments, bidders may have little incentive to develop marginal properties, for which they incur all the costs but enjoy only a portion of the revenues. Fourth, if the government is responsible for environmental or other regulations, it could come under pressure to relax them to ensure a flow of revenue. There may be tax accounting issues, too.

But there are also real advantages to collecting payment in the form of equity. The government ensures that it collects something of value if the rights are valuable. If the developer is worried about being held up, it might welcome an alignment of interests in developing the rights, and the government might find this a good way to make such a commitment. Also, if bidders are financially sound and the other issues are well resolved, economic theory tells us that this sort of auction can generate high revenues.

You have advised bidders in many government radio spectrum auctions. Can you give us some examples of specific advice you have given, and how it worked?

My single biggest success was in the US$14 billion auction in 2006 for wireless spectrum band Advanced Wireless Services (AWS-1) in the U.S.. My client paid about US$2.4 billion to buy more spectrum than T-Mobile acquired in the same auction for US$4.2 billion. Most spectacularly, we made a US$750 million jump bid in the middle of the auction to achieve a particular strategic objective. This bid drove satellite telephone companies that were competing with us out of the auction. Even more important, my client bid to acquire coverage of large areas by assembling a collection of many small licenses, which we correctly forecast would be much cheaper than covering the same area with big licenses. We wound up paying much less than the other big bidders, such as Verizon, T-Mobile, AT&T, and Cingular (which was then a separate company).

How do different rules and different types of bidders affect the type of advice you give?

Here is an example: Recently there were two giant spectrum auctions, in Germany and India. In Germany there were just

four bidders for a large amount of spectrum — 290Mhz of "paired" spectrum for mobile phone services plus a large amount of "unpaired" spectrum for new data services. The government hoped for intense competition and estimated bids would total about 9 billion, but they got only 4 billion. The best advice for bidders in an auction like that is to find a way to coordinate expectations about who would buy what and minimize direct price competition for most of the bands.

In India, the situation was very different. With about 30MHz of spectrum available and seven large bidders, there was bound to be intense competition, and bidders needed to prepare for that.

Do you also advise governments on auction rules? Is there a right way to set the rules, or does it always depend on the government's objectives?

Is there a right way to build a bridge? There are principles and tried-and-true designs, but the best construction depends on a long list of factors.

The auction consultant asks about a range of circumstances surrounding the auction, its goals, the amounts at stake, the risks of collusion and coordination among bidders, and so on. The government can select a simple, standard design, make a small change to a standard design, or tailor the design to the unique circumstances.

What is next? What questions remain to be studied, and for what type of markets?

I spoke to this in my Nemmers Prize lecture at Northwestern University last year. There is still a gap between the theories published in academic journals and the challenges of running real auctions. We need more relevant theory to close the gap. But the real problems are hard and varied, while theorists have the advantage of being able to study idealized situations.

The main issues lie in markets with multiple different but related goods for sale, or markets where the value of the item depends on subsequent decisions, like mineral rights whose value depends on later development decisions. Those are the areas where I expect to see continuing work.

Has market design anything to say about the causes of the 2008/09 financial crisis, or about the new regulations being discussed for financial markets?

That is a whole other subject. Good auction design involves paying attention to what is being sold as well as how it is sold and how performance can be assured. ■

[1] Vivo (Telefónica de España), TIM (Telecom Italia Mobile), OI (the Brazilian player), Claro (Mexico's America Móvil), and Nextel.

Foto: Credito das fotos