Public managers and the private sector join forces to overcome Brazil's longstanding difficulties in providing clean water and sanitation services.
**NEWS BRIEFS**

4 More employed, but fewer new jobs ... consumer confidence down, current account deficit up ... auto production sinks ... inflation pushing at the ceiling ... Rousseff opponents get more traction ... Rousseff defends World Cup spending ... emerging economy growth down ... regional slowdown may be structural ... pause in interest rate hikes ... Brazil seeks Chinese rail investments

**POLITICS**

8 Brazil's changing political landscape
With economic conditions deteriorating and popular discontent growing, presidential contenders are pressed to offer quick-fix solutions to Brazil's problems. The responses have been vague and general. João Augusto de Castro Neves explains why structural changes in the country's demographics and global economic clout will have long-term consequences for the policymaking debate, such as the need to encourage immigration of skilled workers.

**COVER STORIES**

10 Fighting through water and sanitation problems
The water supply for São Paulo city is unreliable. In Rio Guanabara Bay is degraded. Now public managers and the private sector are beginning to join forces to overcome Brazil's longstanding difficulties in providing clean water and sanitation services. Solange Monteiro analyzes what needs to be done and the options available.

18 Can water be recycled?
To generate savings and reduce the risk of shortages, Brazil needs to encourage investment in reuse of water and treated sewage. Companies are taking the lead in reducing the amount of water they need, but for more efficient production, regulation needs to be more realistic and drafted in terms of the different uses for treated water. Some models for efficient and economic use are already in place.

22 The private sector calls for consistency
If private companies are to be attracted to provide water and sanitation services, municipal regulation must be clear and consistent. They must also conform to the federal Sanitation Law. Creation of new agencies has not necessarily improved regulatory quality. Solange Monteiro summarizes the discussions at a recent seminar where experts identified problems in the sector and suggested solutions.

**ENERGY**

26 Lights out
Whether or not electricity might be rationed, the debate about the power supply exposes weaknesses in the sector and the need to use energy more efficiently and to better regulate the market. Kalinka Iaquinto describes what is being done and what is still needed to keep the energy flowing.

**SEMINAR**

30 Paths to industry transformation
Brazilian industry seems to have run aground. At a recent seminar on how the sector can be re-energized, the data—and the recommendations—came thick and fast, with much attention to how industry can benefit from the move to services. Solange Monteiro reports.

**INTERVIEW**

36 Electricity: A promising future
Márcio Zimmermann, executive secretary of the Ministry of Mines and Energy, tells Kalinka Iaquinto and Bertholdo Castro why he is confident that Brazil is not at risk of electricity rationing and why it is feasible that in the next 15 years electricity consumption will be able to double in line with economic growth.
Employment in industry rises, but fewer jobs created
Seasonally adjusted employment in industry increased 0.2% from February to March, reported government statistics agency IBGE, but total industry employment for the first quarter of 2014 was down 2% (May 13), and according to the Ministry of Labor in April Brazil created 105,384 formal jobs—the fewest in April in 15 years. (May 21)

Consumer confidence still sinking
Brazil’s main consumer confidence index fell in May to the lowest level since April 2009 because of poor economic activity and inflationary pressures, the Getulio Vargas Foundation said. The index was at 102.8, down from 106.3 in April, the lowest level since 99.7 in April 2009. (May 23)

External current account deficit up in April
Brazil’s central bank said Friday the country’s current-account deficit widened to US$8.3 billion in April from the US$6.2 billion reported for March. The 12-month deficit was US$81.6 billion, or 3.65% of GDP. Foreign investment in April was US$5.2 billion, for a 12-month total of US$64.5 billion. (May 23)

Bank lending growth slowing
Averaging 31.7% a year, borrowing costs are still at their highest in two years, and outstanding loans in Brazil’s banking system rose only 0.6% in April after growing by 1% in March, the central bank said. Loans by private banks rose about 5.3% in the 12 months through April, compared with 20.5% for state-run lenders. Loans in arrears for 90 days or more, the benchmark for credit delinquencies, again remained unchanged at 4.8%. (May 29)

Minimal economic growth in the first quarter
GDP grew 0.2% quarter-on-quarter in the first quarter of 2014 compared to 0.4% in the fourth quarter of 2013, according to IBGE. Shrinking factory output, falling investment, and flat consumer spending were partly offset by a good performance in agriculture and heavy government spending ahead of the October election. (May 30)

Automobile production falls 18% in May
In May 282,465 cars and trucks were produced—18% less than in May 2013, reported the National Association of Automobile Manufacturers, but up 1.9% since last month. For January through May, production was lower by 13.3% than in the same period in 2013 (June 5)

Inflation up 0.46% in May
Consumer prices slowed in May as the impact on food prices of one of the worst droughts in decades receded only partially. Brazil’s consumer-price index, the IPCA, rose 0.46% compared to 0.67% in April, IBGE said. Through May, 12-month inflation was 6.37% compared to 6.28% in April. (June 6)

IMF: Regional growth decline not temporary
It appears that Latin America is growing little and the outlook is for falling commodity prices and “normalization” of U.S. monetary policy. In an interview with Estado de S. Paulo newspaper, Alejandro Werner, director of the Western Hemisphere Department of the International Monetary Fund (IMF), recommended that governments in the region avoid “easy solutions” and not consider the drop in growth to be temporary. He also said that public protests will have an impact on the conduct of fiscal policy, and social spending must become more efficient. (May 10)

OECD: Growth below trend in emerging economies
Growth is slow in major emerging economies, the OECD says, but recovery in the Eurozone is on track despite signs of a slowdown in Germany. The OECD index of composite leading indicators showed growth conditions below trend in Brazil, China, and India and even losing momentum in Russia, which has been struck by the crisis in Ukraine. For the OECD as a whole, and the United States, Canada, and Japan in particular, growth momentum is stable and Britain is even showing signs of acceleration. (June 13)
POLITICS

Rousseff opponents getting more traction

TV ads are sparking interest in the presidential election. Although Dilma Rousseff (Workers’ Party, PT) improved from 37% of the vote in April to 40% in May, according to an Ibope poll, her direct opponents increased the chances of a second round as Aécio Neves (Brazilian Social Democratic Party, PSDB) rose from 14% to 20% and Eduardo Campos (Brazilian Socialist Party, PSB) from 6% to 11%. (May 22)

Candidates running for 2014 election: President Rousseff (PT), Senator Neves (PSDB), and former Pernambuco Governor Campos (PSB).

Rousseff and Neves court Campos

President Dilma Rousseff (PT) and Senator Aécio Neves (PSDB) are the presidential candidates best placed in the polls and their parties are both working to win the support of former Pernambuco Governor Eduardo Campos (PSB) as an ally in a possible run-off. (June 5)

Rousseff defends World Cup spending

With spending on the World Cup the target of protests in the run-up to the June 12 kick-off match, President Dilma Roussef—seeking reelection in October and facing criticism because Brazil is spending more than US$11 billion on the tournament—insisted that the vast majority of public spending related to the tournament was “for Brazil” over the long term and not limited to the World Cup. She said hosting the tournament had spurred many cities to undertake badly needed public transport projects—though she acknowledged many would not be completed before the World Cup. (June 4)

Pause in interest hikes

As expected the central bank held its policy rate at 11%, pausing its monetary tightening; the futures curve shifted down ahead of the decision. The Monetary Policy Committee (COPOM) issued a brief and neutral statement that given the macro and inflation prospects “at this moment,” the policy interest rate was unchanged. (May 28)

Government cuts tax on foreign loans

A presidential decree cut the duration of external debt and foreign loans subject to the 6% tax from 1 year to 6 months. Analysts saw the move as aimed at attracting hard currency and sustaining the real ahead as the foreign exchange swap program ends in June. (June 5)

Brazil seeks Chinese investments in rail

Cesar Borges, Brazil’s Transport Minister, and BNDES (Brazilian National Development Bank) president Luciano Coutinho were in China in May seeking to interest Chinese companies to consider investing in Brazil’s railroad infrastructure. (May 17)
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Improving access to safe water and good sanitation is crucial not just for economic reasons but to help reduce the public health gap between Brazil and developed countries. According to the World Bank, in 2013 infant mortality in Brazil was 14 per 1,000 live births, compared to no more than 2 to 6 in developed countries. Infants are particularly vulnerable to waterborne diseases. The number of hospitalizations for such diseases in Brazil did fall from 733 per 100,000 inhabitants a year in 1993 to 330 in 2000, but it has stuck there for more than a decade, according to the government statistics agency IBGE. In developed countries, such hospitalizations are fewer than 1 per 100,000 a year.

Between 1968 and 1986, favorable performance of the economy and the quantity of funds available — because public finances were in sound shape — promoted the rapid expansion of services. Brazil had adopted a National Sanitation Plan (PLANASA) in 1968, and by 1971 every Brazilian state had set up a sanitation company.

Between 1970 and 1990, in urban areas in Brazil access to piped water increased from 45% to 95% and to better sanitation from 24% to 42% — piped water having been given priority over sanitation because access to safe water provided faster returns in terms of improving population health.

Then came the late 1980s and early 1990s: As government deficits and hyperinflation dried up public funds, the improvements stopped. After PLANASA was abolished in 1992, state governments found it much harder to finance their water companies.

Since 1994, as inflation dropped and public finances improved, there has been some investment in the sector that has streamlined operations, but until recently no national initiative provided support for large investments. As a result, municipalities took over their own water and sanitation operations, some with tentative openings to private sector operators. In 2007, a new water and sanitation law specified federal policies for the sector, and the government announced the Program for Growth Acceleration (PAC), which detailed plans for major investments in, among other areas, water and sewage infrastructure. However, progress since has crawled, partly because funding has been limited by the expansion of social spending and transfers, and partly because government has limited capacity to carry out complex projects. Urban access has increased only marginally, to 96% for piped water and 53% for sewerage. Meanwhile, more than half of all the 199 million Brazilians still have no access to sanitation services.

Government’s capacity to plan and carry out projects is a particularly critical issue because water and sanitation systems have become so complex, supervised by a multiplicity of regulatory and planning agencies, and raising complex environmental issues.

Meanwhile, researchers have found that the spectrum of diseases is expanding along with the incidence of many waterborne microbial diseases, demanding intensified research and careful monitoring of sanitation activities.

Awareness of water and sanitation problems is also becoming much more widespread, to a large extent because of the growth of the middle class and other changes in Brazil’s demographics. Even if it chooses to ignore the health and economic benefits of finding innovative solutions to these problems, the political class can no longer ignore popular demand for better quality public services.
Brazil’s changing political landscape

João Augusto de Castro Neves

AS BRAZIL GETS READY for another election, presidential hopefuls are polishing their résumés and rehearsing their pledges. At this point, however, the promises are as hollow as they are hopeful. After all, as the dictum goes, candidates campaign in poetry, leaders govern in prose.

Yet, for what is expected to be one of the most competitive elections in nearly two decades, the messages from the campaign trail so far haven’t been particularly lyrical. This has probably less to do with uninspiring candidates and more to do with the context: deteriorating macroeconomic conditions and growing popular discontent.

In such an environment presidential contenders are pressed to offer quick-fix solutions to Brazil’s problems. But to avoid undermining their chances on the street with voters and arousing suspicion among investors, a cautious—and far from detailed—approach to campaign promises has been the norm. Vague calls for structural reforms (political and tax, to start with) and general promises to correct some policies (fiscal policy, for example) have understandably punctuated the pre-electoral landscape.

But beneath the recent market jitters and the cries from the streets lies a more profound story that will sooner or later reshape Brazil’s political landscape in a more meaningful way. While some degree of healthy skepticism is no doubt warranted, the much-talked-about growth of the middle class and Brazil’s rise as an emerging power prefigure to coming structural changes in the country’s demographics and global economic clout, which will have long-term consequences for the policymaking debate. Growing malaise with the quality of public services is an obvious example of the shifts in popular demand that require fresh answers from the political class.

Brazil’s rise in recent years has brought growing pains. Increasing demand for energy to fuel higher levels of consumption, and production, will continue to push the limits of energy development. Vast natural resources give Brazil

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a comparative advantage in pursuing a mixed energy matrix. But regardless of whether the focus will be on renewables, hydrocarbons, or nuclear power, future energy generation will bring environmental issues closer to the center of the public agenda. “Traditional” concerns, such as pollution and deforestation, will likely compete with a new set of concerns about, for instance, water scarcity, oil spills, and perhaps fracking.

Another emerging issue in Brazil’s political landscape will be migration. Years of sustained economic growth have transformed Brazil into a new land of opportunity in the Americas. But a negative externality of this influx is illegal immigration and the challenges it poses both from a security and a humanitarian perspective. In the longer term, the imperative to keep the economy growing and the need to start replacing an aging workforce will also draw more policymaker attention to immigration flows. Presently, the shortage of skilled labor is beginning to push Brasília for creative solutions because it is already a bottleneck for investments in strategic sectors. For a country that wants to innovate, rather than just sending Brazilian students abroad it will be increasingly necessary to attract talented researchers or skilled labor from other countries as part of a broader policy initiative of “reverse brain-drain.”

Brazil’s greater economic clout—despite the recent souring of investor enthusiasm—is also likely to usher in new challenges that could start to reshape the country’s international economic relations. As burgeoning middle classes demand more from the government, leaders will have to prioritize policy options in order to generate enough efficiency to meet expectations. The widespread desire for better and cheaper goods and services, therefore, will create incentives for a more liberal foreign trade agenda. Pressure in the same direction will probably come from some Brazilian companies that have become major sources of investment abroad in recent years as they start to see the other side of the coin—in terms not only of free trade deals but also of measures to protect investments and intellectual property.

Although most of these issues have already debuted in Brazil’s public debate, mainstream political parties and leaders haven’t yet given them their full attention, let alone attempted to assimilate them into actual policy proposals. While many of these challenges may still be incipient—and therefore less of a threat to political survival—they clearly imply that Brazil’s rise was not an end in itself. It was the beginning of a new cycle that ultimately may very well reshape the country’s political landscape.

Unfortunately, these issues haven’t yet inspired presidential campaigners to address them. Hopefully that will change in coming months.

For a country that wants to innovate it will be increasingly necessary to attract talented researchers or skilled labor from other countries as part of a broader policy initiative of “reverse brain-drain.”
Fighting through water and sanitation problems

Public managers and the private sector join forces to overcome Brazil’s longstanding difficulties in providing clean water and sanitation services.

Solange Monteiro

ONE OF BRAZIL’S MOST SERIOUS DEFICITS is its inability to supply basic water and sanitation services. This is dramatically illustrated by the unpredictability of the water supply for São Paulo city and the degradation of Guanabara Bay, which is far from looking as attractive as it does on postcards from Rio de Janeiro.

The recent report from the National Secretariat of Environmental Sanitation of the Ministry of Cities covering 5,070 Brazilian municipalities for 2012 states that Brazil’s water network covers 83% of those municipalities. Experts point out, however, that this “coverage” does not reflect reality. “In the case of water, even if there is the network, it is often dry, supply is infrequent, or insufficient,” says Marilene Ramos, professor at the Brazilian School of Public Administration (EBAPE), Getulio Vargas Foundation, and former president of the State Environmental Institute (INEA
Rio de Janeiro. She adds that sewer coverage is only 48% and sewage treatment a mere 39%. These services basic to public health do not reach about 100 million out of a total population of 199 million.

The obstacles that have caused the backlog are familiar from infrastructure problems in other sectors: red tape that slows or prevents access to resources and a lack of technical capacity and planning that means projects actually completed are of low quality. A study by the Trata Brasil Institute released last May found that of 149 Growth Acceleration Program (PAC) sewer projects, more than half have either been delayed or stopped or were never even started. “Today, the timeline for finishing a project is five to seven years. This means that PAC projects started in 2007 have yet to bring about much improvement in the performance of the sanitation sector,” says Ernani Ciríaco de Miranda, director, Department of Institutional Coordination, Ministry of Cities.

Currently, only 30% of cities have responded to the Sanitation Law of 2007, which requires a municipal master plan, even though failure to comply can be punished by cutting federal funding. “We analyzed the 100 largest Brazilian cities and found out that 34 had no plan at all yet, and only 12 had completed all the items required,” says Edison Carlos, President of the Trata Brasil Institute. “Planning in this area is very complex, because it must take into account activities in four services—water supply, sewage collection and treatment, solid waste management, and drainage and storm water management. This requires studies and many small towns do not even have an engineer

Sewerage services basic to public health do not reach about 100 million out of a total population of 199 million.
who could do them,” Carlos explains.

With the deadline for enforcing the law extended to the end of 2015, each region has now created arrangements to get municipal plans on paper. The Ceará state government, for example, decided to fund planning in cities with less than 20,000 inhabitants through an agreement between the Ministry of Cities, the Water and Sewage Company of Ceará, the regulatory agency, and the association of mayors. “We have 20 counties that now have plans ready thanks to this program and another 37 are in process,” says Mário Fracalossi, Deputy Secretary of Cities. The average cost of each project, run by specialist consultants, is about US$130,000. “At least half of the 184 cities in Ceará cities will have water and sanitation plans by the end of 2015,” he estimates.

AMBITIOUS TARGETS
Sanitation planning is tied to the need to accelerate expansion of these services. The goal stated in the federal Basic Sanitation Plan (PLANSAB) launched in late 2013 is to achieve universal access to water and sewerage services by 2033. Operators consider the target highly ambitious.

The goal stated in the federal Basic Sanitation Plan launched in late 2013 is to achieve universal access to water and sewerage services by 2033. Operators consider the target highly ambitious.

PUBLIC EFFICIENCY
The 700,000 inhabitants of Uberlândia in Minas Gerais can attest to the fact that 100% public management can be 100% successful. The city has had a Department of Water and Sewage (DMAE) since 1967 and a regulatory agency since 2009. Alexandre Silva, DMAE civil engineer and deputy general director, says that the department’s good performance is due to streamlined management—spending on payroll cannot exceed 25% of revenues—and the fact that it manufactures its own pipelines. “Another important factor is the proximity of water resources, since our two water sources are at 5 and 10 kilometers from the city.” But with the city growing, the concern now is how to meet future demand. DMAE has already begun the bidding process for a third system to expand capacity to supply 1.5 million inhabitants in four years.
and sewerage services by 2033. This will require, the government estimates, a total investment of US$132 billion in 2014-2033. Operators in the sector consider the target highly ambitious.

To accelerate the program, it is critical to attract the private sector, either in full control, mixed concession models, or public private partnerships (PPPs). By looking at how to provide sanitation more productively, Trata Brasil’s Carlos says the private sector “reduces losses, whether of water or energy, and reimburses shareholders.” He adds that “many public companies do not have these concerns and end up in deficit for decades.”

So far, the private sector response has been positive. According to Paulo Roberto de Oliveira, CEO of the Brazilian Association of Private Concessionaires of Water and Wastewater (Abcon), private companies are already operating in 297 municipalities, almost 10% of the total; he estimates that they have committed about US$12 billion in investment over 25 years.” Louzival Mascarenhas, managing director, OAS Environmental Solutions, says his company intends to multiply its market share tenfold, to US$30 million, share by 2017. Aegea Sanitation, which has 16% of the private Brazilian sanitation market, expects to increase its customer base by 15% this year alone. “The commitment we have with shareholders is

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<th>Region</th>
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<td>North</td>
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<td>Northeast</td>
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<td><strong>Total</strong></td>
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Source: Basic Sanitation Plan (PLANSAB).

Besides financing, the expectation is that increased participation of the private sector will improve the technical level and the management of operators.
to expand our operations by keeping debt at less than three times earnings before interest, taxes, depreciation and amortization,” says its CEO, Hamilton Amadeo. To finance this rapid growth, Aegea has very supportive shareholders, such as the sovereign wealth fund of the Government of Singapore and the International Financial Corporation (IFC), an arm of the World Bank. “Institutional investors are interested in sanitation; they have a long-term vision and a lot of capital available,” he says.

“To achieve the required expansion in basic sanitation will not be possible with public operators alone,” says Rogério de Paula Tavares, executive director for infrastructure and sanitation of the Federal Savings Bank (CEF). Tavares says that “For public projects … it may take more than a year to get an operation launched; in the private sector, it takes six to eight months.” CEF estimates that it will lend nearly US$5 billion in 2014, of which about half will go to private companies.

**JOINT OPERATION**

In 2012, the government of 367,289-inhabitant Piracicaba city in São Paulo state signed a public-private partnership agreement with Aegea Sanitation to accelerate expansion of its sewage system, which covered only 36% of the city. Since then, US$56 million has been invested in construction and improvements. With the opening in April of the Bela Vista treatment plant, the city has added capacity to treat about 20 million liters of sewage from 110,000 inhabitants before releasing it into the Piracicaba River. With the new plant, the city now treats 98% of its sewage. “Piracicaba city needed this investment and had no capacity to do so,” says Aegea president Hamilton Amadeo. “That’s how the private sector can help achieve universal access to safe water and sanitation.”
Besides financing, the expectation is that increased participation of the private sector will improve the technical level and the management of operators. The problems encountered by public companies are not limited to obstacles to expanded service but also relate to the efficiency of the service itself. Abcon’s Oliveira notes that not only are managers not always well qualified, but “in many cases revenues are lost from lack of current information about consumers,” so that commercial and industrial companies pay residential rates.

**WATER ISSUES**

It is estimated that on average 37% of the water supply is lost in transit. One of the main challenges is to reduce these losses. A recent GO Consultants study points out that cutting the losses by half could save Brazil about US$16 billion. For instance, when Odebrecht Environmental took over water operations in Limeira in São Paulo state in 1994, the city was supplying an average of 870 liters per second to about 55,000 connections. Today, says company CEO, Renato Medeiros, it is serving 96,000 connections with an average of only 814 liters per second.

Experts say a major obstacle to the private sector adopting new technologies to reduce losses is Bidding Law No. 8.666/1993, which...
requires contracting for the lowest price. Valdir Folgosí, president, National Union of Manufacturers of Equipment for Sanitation and Environment, points out that “As long as the priority is to purchase at the lowest price, it will be difficult to sell [more efficient] technology.”

To ensure water security in Brazil, experts agree unanimously, it is necessary to encourage reuse. “São Paulo city distributes about 870 cubic meters of water per second and generates cubic meters of waste water. However, it only has capacity to treat 14 cubic meters, so the other 49 cubic meters are thrown into the rivers. If we do not begin encouraging practices such as reuse, initially for nondrinking purposes, we will not find an adequate solution,” Folgosí says. Carlos adds that although rivers could be a source of water supply, because so much sewage has been dumped into them, “they are in such an advanced degree of degradation, the rivers are dead for water supply.”

The lack of adequate investment generates losses in sanitation operations that have consequences for other

FULL CONCESSION

Two years ago, 188,000-inhabitant Araçatuba city in São Paulo state opened bids for a concession for its entire water and sewage system after its municipal reorganization plan pointed up the need for large investments to promote universal access to water and sanitation. “Since the city already had an appropriate water supply, investments in this case were predominantly needed in the collection and treatment of sewage and reduction of water losses—a major issue that should be addressed in these concessions,” says Louzival Mascarenhas, president of OAS Environmental Solutions. The city granted OAS a 30-year concession for US$150 million. The OAS subsidiary SAMAR (Araçatuba Environmental Solutions) now treats 78,000 cubic meters per day—25% of all the city’s sewage.

Source: samar.
sectors, especially health. Contact with polluted water can trigger a range of diseases; in 2013 gastrointestinal infections alone cost the federal government US$53 million. Experts estimate that every dollar invested in sanitation would save US$4 in health costs. Carlos laments that “We’re talking about the infrastructure of a country that is no longer poor, but still lives with diseases of the Middle Ages.”

“Today, it is no longer possible to think about water without considering its impact in sectors as diverse as energy generation, food security, health, and urban planning,” says Newton Azevedo, Brazil’s representative on the World Water Council. Fernando Malta, coordinator of the Board of Water Resources of the Brazilian Business Council for Sustainable Development, says that in their business plans more and more companies evaluate water security and the impact on it of variables such as urban growth, deficiencies in management, and even climate change. In the past, Malta says, “except for some regions in the Northeast, companies in Brazil had no concern about the water supply; today, however, a number of companies consider water supply to be a factor that can generate operational risk.”

Although businesses no longer take water resources for granted, many individual Brazilians still do. Brazil’s per capita consumption of water is higher than the world average, and the predominant idea among its citizens is that water should be free. To achieve the goal of universal access to water and sanitation, experts agree, the cooperation of the population is crucial. “The fact is that many of the decisions are political, not technical, so the citizen has a fundamental role in this process,” says Carlos. “We are in an election year, and it is time to show candidates that we want Brazil out of this untenable situation.”
Can water be recycled?

Solange Monteiro

CUTTING WATER LOSSES is not the only measure of efficiency in expanding the supply and treatment of water and wastewater in Brazil. Experts point out that, to generate savings and reduce the risk of shortages, the country also needs to encourage investment in reuse of water and treated sewage. “We already have the technology available; the problem is the lack of political will and adequate legislation,” says Ivanildo Hespanhol, director of the International Reference Center on Water Reuse (IRCWR), University of São Paulo. He thinks current regulation of reuse is unreasonably restrictive with regard to the quality of treated effluent because it tries to eliminate risk without considering the actual context of each reuse, charging that “In São Paulo state, for example, today we have the standards of Scandinavia but the rivers of Bangladesh.”

Even so, the industry has taken the lead in reducing water-related costs. Large consumer companies usually need permits for both water intake and release of wastewater, the cost of which depends on the flow and the pollutant load. “In the beginning, these companies just treated the water to reduce the cost of permits. But then they realized that it was not just an effluent, it was a raw material, and began to take water from the environment more sparingly and return it to the river cleaner,” Hespanhol explains.

Currently, a number of industries have not only invested in water reuse but also collect rain, reducing their intake from rivers by 40% to 80%. In the lead are the metallurgical, pulp and paper, and sugarcane industries. In industry water is mainly used for cooling towers. As an example, Hespanhol notes that “The Mercedes-Benz plant in São Paulo requires 6.4 billion cubic meters a day, of which 40% are evaporated in the cooling towers.” Ruddi de Souza, CEO of Veolia Water Technologies, points out that elsewhere in the world there are cases where water reuse reaches 100%. “There are projects in Saudi Arabia that have zero water discharge, in which water is replenished only for evaporation losses,” he says.

An outstanding example of reuse in Brazil today is the Aquapolo, a special purpose company created by Basic Sanitation Company of the São Paulo State (Sabesp) and Odebrecht Environmental company, that can treat a thousand liters of water per second. After treatment the water supplies the petrochemical complex of Mauá. According to Aquapolo, the water...
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savings generated are equivalent to the amount of water needed to supply a city with 500,000 inhabitants. Another example is the Water Supply and Sanitation Company of Campinas city in São Paulo state. In 2012, the company invested in a treatment plant with advanced ultrafiltration membrane technology that allows for removal of viruses, bacteria, solids, and nutrients. Its capacity is equivalent to the wastewater from 90,000 inhabitants, and the treated water supplies primarily the industrial hub of the city.

**Value of sewage**

Marco Aurélio Pereira da Silva, Aegea Director of Research and Development, cites examples from Germany of the economic potential of reuse of treated sewage. The first is in construction, where every year wastewater is used to wash 1.1 billion tons of sand, generating annual savings of about €1 million. The second is production of electricity from sludge to provide energy for sewage treatment plants for cities with 300,000 inhabitants, reducing the generation of solid waste.

In Piracicaba city, Aegea used a sludge drying technology based on solar energy that processes 17,000 metric tons of sludge annually, reducing its volume and saving over US$1 million a year in sanitary landfill. “By 2018 we hope to increase sludge drying to 34,000 metric tons, saving US$2 million,” the company has announced. Because about 60% of dried sludge consists of organic matter, it has energy similar to charcoal and can be used in boilers that burn biomass.

Valdir Folgosi, president, National Union of Manufacturers of Equipment and Environmental Sanitation, believes that Brazil has the technology to meet the demand for water reuse, but he is convinced development of this market will rely mostly on private water and sanitation private companies—public sector companies cannot innovate because the procurement law requires they purchase equipment for the lowest price.

Hespanhol points out that there is still much planning to be done. “We see today the municipalities and states drawing up sanitation master plans with little attention to water reuse,” he says regretfully. He argues for comprehensive planning by identifying the main characteristics of the watershed in terms of agriculture, industry concentration, and urban density, and treating water and sewage differentially to meet the demand for each type of consumer. He also advocates for the National Water Agency to set criteria for water reuse and reduce the cost of permits for water intake from rivers for companies that find ways to reuse water.
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**COMMITTED TO PROVIDING UNIVERSAL SANITATION AND CLEAN WATER IN BRAZIL**

The private sector calls for consistency

Solange Monteiro

If the private sector is to participate in expanding basic sanitation in Brazil it will be important for municipalities to define how they will regulate their services, as required by the Sanitation Law, which also sets out rules that go beyond the four basic activities: water supply, sewage collection and treatment of solid waste, waste water management, and drainage of storm water. “Regulation is an essential factor for effective services. We have not looked into these requirements with due care, and today hundreds of sanitation plans may be questioned for not enforcing the law properly,” warns Édison Carlos, president, Trata Brasil Institute.

Currently, according to the Brazilian Association of Regulatory Agencies (ABAR), 50 agencies—most of them state agencies—have legal authority to regulate sanitation. Although the legislation has driven creation of new municipal agencies in recent years, that does not necessarily mean there has been a proportional increase in regulatory quality. “Many of the agencies are precarious; some exist on paper only to meet the requirement of the law,” says Marilene Ramos, former president of the National Environmental Institute (INEA) and professor at the Brazilian School of Public and Business Administration (EBAPE) of the Getulio Vargas Foundation (FGV). Adds Joisa Campanher Dutra, coordinator of the FGV Centre for Studies in Regulation and Infrastructure (CERI), “We need formulas to strengthen regulation.”

In May, CERI organized a seminar on “Regulation and Sustainability of Water and Wastewater Services” at the request of the Secretary of Strategic Affairs of the Ministry of Cities. The seminar discussed issues related of how water and sewerage services can be appropriately expanded. Today, the law allows for a variety of local, state, and intermunicipal regulatory arrangements. Ramos points out the threat that regulation may become fragmented given the huge number of small agencies that have little technical capacity to regulate services. However, if the scale is appropriate, state and other agencies can enforce regulations more efficiently.
**Regulatory framework**

Vinicius Benevides, ABAR president, points out that clear and stable regulation is essential for private companies: Surveys, he says, show that “The regulatory framework is the third most important factor for companies wanting to invest, behind only market size and political stability, and ahead of such other elements as macroeconomic stability.”

“Currently, investors are concerned about risk, return, and regulation,” adds Patrick Mullen, of the International Finance Corporation (IFC), which is part of the World Bank Group. “Private investment flows to countries with political support, funded projects, and a favorable regulatory environment.” The World Bank estimates that in coming years private investments in the sanitation sector will accelerate in emerging countries, especially China and Brazil.

Carlos Henrique da Cruz Lima, director of institutional relations, National Union of Private Dealers in Public Water and Wastewater, estimates that Brazilian sanitation companies, public and private, currently generate nearly US$17 billion in revenues annually, but potential revenue, he says, is US$30 billion, adding “No single country has an untapped market of this magnitude; this shows the importance of regulation that promotes peaceful coexistence between public and private companies.” The need for sound regulation that supports predictability for new projects is reinforced by Carlos Alberto Rossito, of consultants GO Associates, who says, “Only then we will be able to break through today’s ceiling of US$4.5 billion annual investment.”

**Credibility at stake**

To succeed, however, regulators in the water and sanitation sector must find ways to mitigate a crisis related to the credibility of their activity. Experts point out that doubts about independence of regulatory agencies are already being reflected in new negotiated concessions. Mauricio Portugal, partner in the Portugal Ribeiro law firm, says the decrease in discretionary regulation “is reflected in more rigid contracts, with less space for regulatory decisions,” he notes. “A prevalent condition in new contracts, for example, is
arbitration,” he says. As a result, the role of the regulator is diminished. Silvia Calou, chief executive, Calou Consulting and former president of the São Paulo state Regulatory Agency for Energy and Sanitation, agrees with Portugal: “We have to recognize that there is a problem and discuss alternatives.”

Renato Medeiros, who manages the operations of Odebrecht Environmental in the states of Rio de Janeiro and Espirito Santo, says that the company has to deal with three types of regulation: municipal, state, and multi-municipality consortiums. “We have no opinion on what the best model would be because we have the best and worst examples in all three situations,” he says. But he notes that “We are better regulated where we have better contracts,” arguing that clear goals and impartial mechanisms facilitate concession operations.

Helcio Tokeshi, director, GP Investments, believes the current Brazilian sanitation sector demands better technical ability and a more predictable vision. “Instead of insisting on the ideal model, one can have regulation by contract at the municipal level, close monitoring of services by the customers, and more complex issues addressed by the state,” he says. “It’s a mixed model with some complexity, but it seems totally manageable and possible…. It is not economically feasible to have branches in all counties or groups of counties.”

**Long term**

Rui Marques, professor, Lisbon University, emphasizes that the important thing is that regulatory initiatives have a long-term perspective that invites public support. “Regulation should be transparent, clear, and rely on full disclosure,” he says. For example, the government of Portugal now issues a performance rating of sanitation service providers in colors for easy understanding. Marques notes that because providers are clearly embarrassed when they receive the red rating, there has been a substantial improvement in services over time.

**SANITATION GRANT**

In the Getulio Vargas Foundation Seminar on the Regulation and Sustainability of Water and Sewer Services on May 16, Marcelo Neri, Minister of Strategic Affairs, argued for using the Family Grant program platform to improve sanitation. The idea is to encourage investments that meet the needs of Brazilians who do not have access to sanitation services. He points out that surveys show that the population sees the quality of sanitation service as much worse than that of water and garbage collection services. “The Family Grant is a fantastic platform for people lacking sanitation, because its data bank could be used as a shortcut for creating programs for poor families. We could, for example, pay sanitation companies upon delivery of a connection or routine maintenance with proper documentation,” he suggested.
It was not a specific day of the week or the month, but it was a few years ago when people started to realize that water is a natural resource that could come to an end. From then on, governments, individuals, and public and private organizations have seen the yellow warning light on and the world has started to move towards solutions. Thinking about solutions on a large scale, here in Brazil OAS Investimentos has created OAS Soluções Ambientais, a company that creates efficient and sustainable solutions for supplying systems, collection, treatment, water distribution, and environmental management of industrial waste. OAS Soluções Ambientais holds and takes advantage of the experience OAS has acquired by rendering of services to the main national and international operators that consider the company to be one of the biggest private operators in the sector. Two main divisions of the company are already working at their full activity: SAMAR which holds the water charter service and saddle of Araçatuba city (São Paulo), with 188,000 inhabitants, and Epasa, concessionaire that annually provides about 50 million cubit meters of water to serve more than 8 million users in Lima, capital of Peru. The planet keeps asking for water and solutions for the environment. Everyone wants a better quality of life. And OAS Soluções Ambientais knows how to help them achieve that.
Lights out

Whether or not there is a risk that electricity will be rationed, the debate about the electric power supply exposes the fragility of electric power sector and the need to use energy more efficiently and to better regulate the market.

Kalinka Iaquinto

IN LATE 2013 AND EARLY THIS YEAR, Brazil experienced high temperatures and little rain, both of which had a direct impact on the power supply and raised questions about government energy policy—especially the 20% reduction in the price of electricity. The problems also raised the specter of rationing of the type the country faced in 2001.

Government rejects the idea that energy might be rationed, and points to the expanded numbers of plants and transmission lines as well as adding new energy sources, such as wind and solar. However, independent experts stress the need to conserve energy because, as incomes rise, giving consumers access to appliances and electronics, consumption of electricity increases rapidly. The fact is that whether or not there is a real risk of rationing, the mere mention of it suggests that there are short circuits to be fixed by, for instance, more efficient and rational use of energy and clearer rules for the energy market.

Lavinia Holanda, FGV coordinator of research on energy, says that it is time to look into both financial and energy issues. The financial issue results from the involuntary exposure of distributors to high market prices. “This is having a major financial impact on distributors of electricity. That is why the government came up with measures to help them,” she says. The Treasury has provided US$5 billion to distributors of electricity. Holanda also argues that the electric power problem is deep and structural: “The electricity
“The electricity sector is very complex and requires planning, not only for short-term initiatives but also medium- and long-term ones.” She suggests it is time for clearer regulations, pointing out that “There are opportunities for technologies and regulation to bring new ways of generating energy.”

Lavinia Holanda

Regarding how electricity is used, most experts agree that it is possible to educate Brazilians on how to use energy efficiently. Appeals to consumers to save energy, financial incentives through discounts for those who reduce consumption, higher tariffs, and consumption quotas are some of the suggestions that have been made. “The population reacts with maturity when the situation is explained clearly, and their cooperation is the best way to get through this difficult period with minimal problems,” says Mário Veiga, president of PSR Consulting.

FGV’s Holanda notes that the electricity sector has not used the electricity price to moderate consumption more often. “The idea that residential consumers will not adjust their consumption of electricity if the electricity price is raised or there is a different price for hours when the system is overloaded, is an idea from the past, when people had fewer appliances and electronic devices at home,” she says.

“We believe that electricity price is the main market indicator for balancing supply and demand,” Reginaldo Almeida de Medeiros, CEO of the Brazilian Association of Energy Traders (ABRACEEL), agrees. He argues that residential customers should also have access to a free market in electricity, which is currently available only for large commercial enterprises, which pay the costs, including the cost of thermal plants. Prices change for residential consumers only annually. When there is a mismatch

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The electric sector by the numbers

Expansion of power capacity
- Between 1996 and 2000, consumption grew 26.5% and installed power plant capacity increased by 24.6%.
- Between 2001 and 2013, consumption grew by 50.8% and installed generation capacity grew 72.4%.

Diversification of energy sources
- Between 2001 and 2013 the installed capacity of conventional thermal power plants (fossil fuel) grew 351%.
- In 2005 thermal biomass accounted for 1,755 MW of power. In 2014 it represented 10,114 MW—a more than sixfold increase.
- In 2005 wind energy produced 29 MW. By the end of 2013 it produced 2,202 MW. The forecast for 2014 is 4,286 MW and for 2015 9,383 MW.

Thermal power
- In 2002, thermal accounted for 16% of total Brazilian energy. In 2013, it was 29%.

Expansion of transmission lines
- Between 1996 and 2002 every year 1,562 km of transmission lines were installed. Between 2003 and 2013 installation rose to 3,710 km per year.

Source: Company for Energy Research (EPE).
“The population reacts with maturity when the situation is explained clearly, and their cooperation is the best way to get through this difficult period with minimal problems.”

Mário Veiga

between costs and prices, as there is today, the law provides for an extraordinary tariff review to restore the cash flow of distributors of electricity.

Electric energy is very expensive today in large part because of the cost overruns of thermal power plants. Moreover, the prices distributors charge are outdated. To correct the distortion, in 2013 the National Electric Energy Agency (ANEEL) proposed disclosing the costs of residential energy according to electric system loads. “This would be a signal to alert consumers that energy is very expensive and they should reduce consumption,” Medeiros explains. He believes the best solution would be to raise tariffs or immediately adopt differential pricing according to system loads. That was initially scheduled to be introduced this year but has been postponed to 2015. Maurício Tolmasquin, president of the Company for Energy Research (EPE), noted that the government plans to create electricity rates differentiated by three hydrological levels. However, Veiga points out, “The concern is that as time passes and no action is taken, the range of options will progressively narrow, which increases the possibility of greater losses for the economy.”

Fear of rationing

Carlos Otavio Quintella, executive director of the FGV Center for Energy Studies, points out that losses are already being felt because companies that need additional electricity this year will have to pay more per megawatt-hour. But the problems do not stop there, he says: “Worried about inflation and popularity, the government tries to prevent the higher costs of producing electricity from spilling over into the regulated market, which includes residential consumers. When the bill is not presented to the consumer, the taxpayer pays the bill, since the Treasury is bankrolling the freeze in electricity rates.”

Quintella notes all possibilities are being used to maintain the supply of electricity. “The situation has required the operation of thermal power plants at full capacity in an attempt to mitigate the reduction in the supply of electricity generated by hydropower plants,” he says. Thermal power plants are more expensive and depend on the availability of gas supply and their capacity to produce energy continuously. “Low precipitation and the heat wave have revealed the weaknesses the electric power sector has accumulated in recent years,” he concludes. “With dwindling reservoirs, thermal power plants running at full capacity, and record consumption, the country faces the biggest seasonal blackouts in seven years and the possibility of rationing. The soaring cost of generation sooner or later will hit consumers’ electricity bills.”

The April 2014 Energy Data Report from PSR Consulting highlighted how precarious Brazilian energy security is. The PSR simulations suggest there is a 46% chance that hydroelectric reservoirs will fall below 10%. “If that happens,” Veiga says, “The government probably would declare an emergency and sharply reduce consumption, which would have a negative impact on the economy. … That is why we recommend a preventive reduction of 6% in consumption, which would minimize losses for the economy.”

The government challenges these alarming views. Although the country has been facing the worst hydrological conditions in 81 years, EPE’s Tolmasquin
believes the country will manage through 2014 and face no major risks in 2015. “Our power system has a much more robust structural balance than in the past,” he says. “The risk of [rationing] is low—just one-sixth of what was recorded in 2001, when we had rationing.” Tomasquin argues that there are three factors that make rationing less likely today than in 2001: expansion of power capacity, diversification of sources of energy, and expanding trade in energy between regions.

The number of transmission lines has more than doubled since 2001. According to the EPE, in 2001 the Southern region could send only 2,600 MW to the Southeast region. Today capacity can reach 5,800 MW. In 2001 the Northern region could send only 900 MW to the Southeast and 1,100 MW to the Northeast; today it can send 4,100 MW southeast and 3,300 MW northeast.

Electric sector deadlocks
It is undeniable that since 2004 better laws and the creation of the EPE—which has had a major role in drafting the Decennial Expansion Plans and conducting procurement auctions—provide better support for the electricity sector. However, difficulties remain. The government was criticized in 2012 for not carrying out the auction of energy contracts required by law. The auction did take place in 2013, but it was not successful. In 2014, the government carried out an extraordinary auction and had to accept prices far above the usual: US$43 per megawatt-hour, up from US$11 per megawatt-hour.

As for the electric power supply, the problems lie in planning flaws and inadequate monitoring. The prime example is the fact that many power plant projects have been completed before there were transmission lines ready to transport their energy to consumers. Ironically, what has helped keep electricity supply and demand somewhat in balance in 2013 and 2014 is the underperformance of the economy. Five years ago, planners envisaged much higher consumption than there actually is today.

“When the bill is not presented to the consumer, the taxpayer pays the bill, since the Treasury is bankrolling the freeze in electricity rates.”

Carlos Otavio Quintella
BRAZILIAN MANUFACTURING seems to have run aground. From 2003 to 2013, manufacturing lost 6 percentage points in its share in gross domestic product (GDP). According to data from the Federation of Industries of São Paulo (Fiesp), since 2003 industrial production has grown by only 25% while retail trade volume grew 117%. In 2013 the external trade deficit reached a record high of US$54.5 billion, and imported manufactures have doubled their share in the domestic market in the last decade. There are many reasons for the decline of domestic industry: the effects of the 2008 global economic crisis, loss of competitiveness due to such factors as an over-valued exchange rate, poor-quality infrastructure, and the well-known Brazil cost. So what can be done?

To discuss possible ways manufacturing might recover, the School of Economics of São Paulo (EESP) and the Brazilian Institute of Economics (IBRE) of the Getulio Vargas Foundation held a seminar on “Industry and Production Development in Brazil” May 26–27 in São Paulo. In launching the seminar EESP’s Nelson Marconi pointed out that the loss of manufacturing’s share in Brazilian GDP was premature in terms of the global historical pattern: in developed countries the turning point had come when per capita income reached US$10,000; in Brazil it happened when per capita income reached
US$4,000. IBRE director Luiz Guilherme Schymura commented that “The drop in industrial activity has been accentuated since 2010, and this year, we are still seeing a decline in industry confidence. Maybe today’s 11% of GDP is the new industry share in the economy.” If so, he said, that would have important implications for the formulation of economic policy.

**The move to services**
Experts are also concerned with the new distribution of GDP. In Brazil, part of industry’s share in the economy was lost to the service sector, which in Brazil has low productivity and little added value; in more competitive economies high-skilled services that support industrial activity predominate. EESP director Yoshiaki Nakano noted that the rise of global supply chains has rendered provision of technological services vital for industry success. “In Brazil, however, political populism has kept the exchange rate overvalued and raised wages, generating expansion of income and employment through service sector growth,” he explained. He mourned the lack of an overall strategy for inserting the country effectively into the global economy, saying “It takes political will and pragmatic vision to boost productivity.”

David Kupfer of the Federal University of Rio de Janeiro (UFRJ) pointed out that delivery of services adds value to the products provided. It involves such product-related activities as research, planning, marketing, distribution, and after-sale services. “From the point of view of integration of the country’s trade into the global economy,” he said, “it implies organizational and technological change that puts more intangibles into industry output.”

Francisco Eduardo Pires de Souza, also of UFRJ, was of the opinion that “As we are close to full employment and the workforce is expected to grow more slowly, economic growth will depend even more on increased productivity.” He noted that despite low growth, industry still has higher productivity than services, and said, “That is why industry is essential to pull more dynamic services, which in turn will improve productivity and boost the growth of industry.”

**Global aim**
Cristina Reis of the Federal University of ABC (UFABC), pointed out that promoting the trend to services involves integrating economic and industrial policies with trade liberalization. EESP’s Lucas Ferraz added that trade in intermediate goods goes through global supply chains that today are much broader in both length and value-added; they “demand investments to improve transport infrastructure, trade facilitation, and training of workers, as well as a good business environment.”

The prospects for such investments do not look promising. Brazil is among the most closed economies in the world and among those that use the most domestic intermediate inputs. “In China 61% of the value of an exported product is national. In Brazil it is about 87%,” Ferraz said. If at first glance this seems to show that most wealth is generated in the country, it also indicates the low diversity and dynamism of local industry, which is also demonstrated by the fact that most imported manufactures are technology-intensive. According to IBRE’s Lia Valls, the low technological content in Brazilian manufactures is reflected in Brazil’s small share in total world manufactures exports: only 0.7% since 2009.

“Could more integration of domestic industry into global supply chains help motivate Brazil to streamline negotiation of trade agreements? According to Valls, “It is not clear that institutional arrangements ensure insertion in global supply chains or productivity gains if they do not promote a favorable environment for market integration.”
In Brazil, part of industry’s share in the economy was lost to the service sector, which in Brazil has low productivity and little added value; in more competitive economies high-skilled services that support industrial activity predominate.

She believes the Brazilian trade agenda should focus on efforts to promote Latin American integration and reconsider membership in mega-trade deals. However, she said, “The priority must be on domestic reforms.”

**Economic adjustment**

Valls is convinced that any strategy for liberalizing trade will require that Brazil relieve the internal obstacles to improve industry’s external competitiveness. Otaviano Canuto of the World Bank added that, “Brazil is one of the worst in the world in terms of cost of doing business. There is a lack of competition and pervasive waste. Total factor productivity could have been much higher if we had not wasted resources on low-value activities.”

IBRE’s Samuel Pessôa emphasized the effects on industry of low domestic savings. “In an economy that saves little,” he said, “industry has a hard life because the economy will consume many services.” He estimated that “The difference in savings between Brazil and China is about 30%. If Brazil had domestic savings like China’s, industry’s participation in GDP would be 10% higher.”

For EESP’s Nakano, the crux of the issue is a familiar trio: high interest rates, an appreciated exchange rate, and high taxes; he noted that “Any stimulus policy only compensates in part for ... these factors.” EESP professor and former finance minister Luiz Carlos Bresser Pereira argued that exchange rate populism and economic orthodoxy have led Brazil to allow the exchange rate to further appreciate and use high interest rates to achieve its inflation target—he called this “a profound disaster.”

José Luis Oreiro of UFRJ pointed out that the overvaluation that occurred between 2005 and 2010 was only partially reversed, and the reduction of interest rates was transitory. IBRE’s Nelson Barbosa agreed: “As for the interest rate, the important thing is to maintain the government primary balance surplus to reduce gross debt and maintain economic stability without raising interest rates, keeping inflation on target.” Barbosa spoke for fiscal adjustment to achieve a permanent primary balance surplus and resisting the temptation to manage the exchange rate. In sum, he said, “In recent months, the central bank tried to avoid excessive exchange rate depreciation by selling foreign currency swaps. This did reduce short-term volatility, but it prevented the exchange rate adjustment necessary to restore external competitiveness and reduce the current account deficit.”

**Industrial policy pro and con**

Seminar panelists pointed out that macroeconomic distortions have not only affected industry but also undermined the effectiveness of industrial policy itself. In the last decade, the industry relied on three government initiatives: the Industrial, Technological and Foreign Trade Policy (PITCE, 2004), the Productive Development Policy (PDP, 2008), and the Greater Brazil Plan (PBM, 2011). None has been able to prevent the slide in manufacturing as a share of GDP. “It is difficult to quantify the outcome of the
“It takes political will and pragmatic vision to boost productivity.”

*Yoshiaki Nakano*

“Greater Brazil Plan because the period was short and implementation gradual,” said Renato Corona Fernandes, manager of the Fiesp Department of Competitiveness and Technology. “Our research found that between 2008 and 2012, the Brazil cost and the overvaluation of the Brazilian currency raised the cost of manufacturing production on average by 34.6%.” IBRE’s Regis Bonelli pointed out that until 2012 manufacturing productivity was rising: “It grew less than in the United States, which is considered the world frontier for labor productivity, but it has continued to increase. This suggests that the competitiveness problems have not been inside the factory.”

Most analysts, however, argue that industry’s problems could have been even worse without industrial policies. “The tax exemptions represented relief against the overvalued exchange rate and a tax system that discourages local production compared to imported,” said Marcelo Miterhof of the National Development Bank (BNDES). IBRE’s Barbosa said that the package of measures for supporting industry was able to stabilize investment: “GDP growth slowed, but investment has been more or less stable since 2010. This means that incentive policies like reducing the tax on industrial products helped to lower the relative prices of capital goods.”

“As we are close to full employment and the workforce is expected to grow more slowly, economic growth will depend even more on increased productivity.”

*Francisco Eduardo Pires de Souza*
Some experts reiterated, however, that despite macroeconomic distortions the current model of industrial policy is not without flaws. Mauricio Canêdo of IBRE stressed that “An industrial policy cannot be aimed at developing industries at any cost. If the goals and duration are not well-defined, there is a risk of developing noncompetitive industrial sectors.”

Mansueto Almeida of the Institute of Applied Economic Research (IPEA) also advocated more transparent controls and a reevaluation of policies. He also considered subsidized credit operations excessive because in the current scenario Brazil cannot afford them: “Today, the low level of domestic saving and the large social programs do not leave much fiscal space for the costs of a robust industrial policy. In the early 1970s when public savings accounted for 6% of GDP, we could do it. At that time, we invested 2.5% of GDP in education and 3.5% of GDP in social security. Today social spending accounts for 23.5% of GDP. We cannot afford both social and industrial policies at the same time.” He also condemned the expansion of public debt by 10% of GDP to subsidize lending by public banks.

**Innovation in focus**

IBRE’s Canêdo warned that protectionist bias in industrial policy hampers innovation and competitiveness: “We have a well-designed innovation policy but . . . no one innovates by chance. Companies protected from competition will not be pressed to invest in technology to improve productivity.”

One federal initiative praised by the experts is Inova Enterprise, launched in 2013. The program’s goal is to contract US$14 billion in 2014 to promote product creation in strategic areas of national interest or potential demand. “By March, BNDES had selected 331 company plans, totaling US$11 billion,” said Miterhof. Nine plans are already underway in ethanol (2), oil and gas, energy, defense and aerospace, telecommunications, agribusiness, health, and environmental sustainability. João de Negri, executive secretary, Ministry of Science, Technology and Innovation, points out that “The program also involves partnerships between companies and research institutes, which promotes the formation of consortia.”

Mariano Laplane of the State University of Campinas believes that one problem with industrial policies and innovation in Brazil is lack of a culture of innovation, which can be stimulated through greater cooperation. José Eduardo Cassiolato of UFRJ agreed, pointing out that “The trend of increasing intangible assets in industrial production—such as software, scientific research, design, and product development—demands a more integrated world.”
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Electricity: A promising future

Márcio Zimmermann
Executive Secretary of the Ministry of Mines and Energy

Kalinka Iaquinto and Bertholdo Castro

ENGINEER MÁRCIO ZIMMERMANN is executive secretary of the Ministry of Mines and Energy. He worked on the construction of the Itaipu hydropower project and has held various positions in the energy sector, among them director of the Research and Development Research Center (CEPEL) and director of engineering for Eletrobras, a major Brazilian electric utility. Zimmermann assures us that Brazil is not at risk of electricity rationing, although there is always the possibility of interruptions. The system, he says, is structured to meet electricity demand and minimize the risks of interruptions. Over the next 15 years, he expects per capita consumption of electricity to double in line with the economic growth forecast. He considers this expansion feasible because the electric sector is well-regarded by investors and attracts capital.

The Brazilian Economy—What is Brazil’s energy situation today?

Márcio Zimmermann—Since the 1960s the Brazilian electricity system has always worked with a relatively small risk of a power deficit, no more than about 5%. This was a criterion used in other countries that we adopted for the hydrothermal system in Brazil. What does this mean? We should always have enough power plants and transmission lines to meet electricity demand. On the other hand, when there is a structural imbalance between supply and demand, this leads to rationing. That happened...
in 2001 when our model was failing to attract investment because there were no guarantees to take to the bank, and there were no contracts for sale of electricity. Since 2003 we have corrected these problems and are now auctioning concessions for new power plants that [will keep us] five years ahead of projected future demand.

Is there a risk of rationing?
Brazil has never experienced rationing when there was balance between supply and demand for electricity. … This year water flows are lower than in 2001, yet the system is holding up well. Why? Because we built enough power plants and transmission lines, and even with less water in the reservoirs we have options, such as thermal power plants, that can meet the demand. … In May the risk to the electricity supply in the Southeast was only 4%, compared to 25% in 2001. … The balance between supply and demand is very important. Worldwide no one works with zero risk to the electricity supply [because that would be prohibitively costly]. That would be absurd.

Is it because of climate change that thermal power has been used more intensively in recent years?
When we planned the Brazilian electric system, it was very much based on the Canadian model. It is a hydrothermal system. We have probabilistic models for projecting the future flow of water, trying to minimize operating costs. What happens when we expect less water? The model protects the electrical system by raising the price [to balance supply and demand].

When water supply is normal, the short-term price of electricity drops significantly. The system operating cost is US$15 to US$30 per megawatt hour without thermal generation. Thermal power is meeting part of the market demand. The cost for 80% of the thermal power plants is US$100 and US$125 per megawatt hour.

This year water flows are lower than in 2001, yet the system is holding up well. Why? Because we built enough power plants and transmission lines, and even with less water in the reservoirs we can meet the demand.

How do we reconcile higher consumption and a stronger economy if there is a scenario of low rainfall?
So far, in all auctions for concessions for new power plants, the bids were more than sufficient to meet future demand for electricity. There are more people who want to invest in the Brazilian electricity sector. Over the past decade, ours has been one of the world’s most successful in attracting foreign investment. Why? By having a well-structured framework. Investors have the guarantee of power purchase agreements (PPAs) that they can use as collateral to obtain project financing from banks. This means that the investment-funding wheel keeps on turning. We do auctions for concessions of electricity production three to five years before [projected increase in demand]. …The more entrepreneurs believe in the sector—and this has been happening—the more competition and bids in auctions [thereby ensuring the future supply of electricity].
INTERVIEW

What is the outlook for sources of energy in Brazil? I believe that in the next decade hydropower will exhaust its potential. Energy sources that use fossil fuels have the challenge of improving technology to reduce emissions of CO₂ (carbon dioxide). Nuclear energy will also be an alternative for the next decade since Brazil has the reserves and technology for uranium enrichment. Solar and wind energy have great potential. Brazil is in a very comfortable position to double per capita consumption of electricity.

You said a lot of foreign capital is coming here. How much will demand for electricity grow? Today, our per capita consumption is 2,400 kilowatt-hours a year. In the United States it is 15,000 kilowatt-hours—almost six times more. European countries consume between 6,000 and 15,000 kilowatt-hours a year, South Africa more than 4,000 kilowatt-hours. Investors know Brazil has a growing middle class, which increases consumption. … On average energy consumption in Brazil grows 4%, 5% a year.

What is the government’s ethanol policy? Brazil has a comparative advantage producing ethanol. We were efficient to the point of having the cheapest ethanol in the world. The yield of ethanol per hectare beats by far the yield from American corn. I believe that Brazil is likely to take up production of ethanol strongly. … We had some recent problems that affected sugar cane crops and that caused problems for certain companies, but the government policy has always been to work hard for ethanol to be competitive again. Two or three years ago, sugarcane products were 18% of the total energy produced in the country compared to 14% from hydroelectricity. Ethanol and biomass have a huge weight in energy production and this has allowed Brazil to achieve 46% renewable energy.

So far, in all auctions for concessions for new power plants, the bids were more than sufficient to meet future demand for electricity. There are more people who want to invest in the Brazilian electricity sector.

For a long time, when there were problems from power surges, there was talk of the need for a major transmission line to connect the entire electrical system. Are we still missing that? Brazil currently has only one capital that is not linked to the Brazilian electricity transmission network; that is Boa Vista in Roraima state. We auctioned the line for that last year, and it should enter the system at the end of 2015 or early in 2016. Brazil’s network had a little over 70,000 km of transmission lines in the early 2000s and now has 120,000 km. Brazil has not stood still. We have one of the largest laboratories for high-voltage research in the southern hemisphere—the Center for Electrical Energy Research (Cepel). Cepel is building an ultra-high-voltage laboratory in Adrianopolis in the state of Rio de Janeiro.
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The Brazilian economy seems to have slowed further, though as yet there is no indication that it is seriously under stress, at least for 2014. The growth of GDP, seasonally adjusted, was modest at 0.2% quarter-on-quarter in the first quarter of the year, down from 0.4% in the fourth quarter of 2013. Not surprisingly, gross fixed investment declined by 2.1% quarter-on-quarter. This was the third consecutive decline; it appears that expectations for growth of the economy have become increasingly pessimistic. Certainly economic activity this year will be slower than last year.

For 2014, we have revised our growth forecast to 1.6% compared to our March forecast of 1.8%. On the demand side, growth will continue to be supported primarily by the consumption of households and government and secondarily by net exports, which will offset an expected contraction of 2% in gross fixed investment. On the supply side, the main growth driver is services. Despite the weakness of the economy, we have again raised our inflation forecast for the year, up from 6.4% to 6.7%.

Since 2008, the expansion of consumer credit, particularly from public banks; greater tolerance for inflation; looser fiscal policy; and more government intervention in the economy have shown disappointing results. The Brazilian economy came out of recession in 2009 but has not been able to achieve a robust and sustained recovery. The external current account has deteriorated significantly, even with low growth, and inflation has risen despite a variety of price controls.

For 2015, we forecast that growth will slow to 1.2% and inflation will rise to 6.8%. We expect that the next government will make corrections to economic policy by tightening fiscal and monetary policies, reducing credit from state-owned banks, and correcting controlled prices. In the short run, these policies will have an adverse effect on growth and inflation, but over the medium term, as economic imbalances and distortions are reduced, confidence and investment should rise, gradually pushing up the potential growth rate of the economy.

### Brazil: IBRE baseline scenario for 2014-2015

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</thead>
<tbody>
<tr>
<td>Real GDP growth (%)</td>
<td>7.5</td>
<td>2.7</td>
<td>1.0</td>
<td>2.5</td>
<td>1.8</td>
<td>1.6</td>
<td>1.2</td>
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<tr>
<td>Inflation (%)</td>
<td>5.9</td>
<td>6.5</td>
<td>5.6</td>
<td>5.9</td>
<td>6.4</td>
<td>6.7</td>
<td>6.8</td>
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<tr>
<td>Central Bank rate (%)</td>
<td>10.75</td>
<td>11.00</td>
<td>7.25</td>
<td>10.00</td>
<td>11.00</td>
<td>11.00</td>
<td>12.25</td>
</tr>
<tr>
<td>Exchange rate (1)</td>
<td>1.8</td>
<td>1.7</td>
<td>1.9</td>
<td>2.2</td>
<td>2.5</td>
<td>2.3</td>
<td>2.3</td>
</tr>
<tr>
<td>Primary balance surplus (2)</td>
<td>1.5</td>
<td>2.4</td>
<td>1.6</td>
<td>0.7</td>
<td>0.8</td>
<td>0.7</td>
<td>1.5</td>
</tr>
<tr>
<td>External current account balance (%)</td>
<td>-2.3</td>
<td>-2.1</td>
<td>-2.2</td>
<td>-3.7</td>
<td>-3.9</td>
<td>-3.6</td>
<td>-3.5</td>
</tr>
<tr>
<td>Trade balance (US$ billions)</td>
<td>20</td>
<td>30</td>
<td>18</td>
<td>3</td>
<td>1</td>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>Export (US$ billions)</td>
<td>202</td>
<td>256</td>
<td>243</td>
<td>242</td>
<td>241</td>
<td>237</td>
<td>241</td>
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<tr>
<td>International reserves (US$ billion)</td>
<td>289</td>
<td>352</td>
<td>378</td>
<td>374</td>
<td>370</td>
<td>380</td>
<td>290</td>
</tr>
</tbody>
</table>

Source: Brazilian Institute of Geography and Statistics, Central Bank of Brazil, IBRE staff projections.

1 Recurring government primary balance surplus defined as budget balance excluding interest payments on public debt, extraordinary revenues from dividends and concessions, and some investments of the Growth Acceleration Program.
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