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# Powering up: Latin America's energy challenges: revising the past: the Paraguayan energy sector in perspective

## Report

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# Revising the Past: The Paraguayan Energy Sector in Perspective



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Paraguay is one of the largest exporters of electric energy in the world but is also one of the lowest consumers of electricity in all of Latin America. Its energy sector is dominated by an enormous endowment of hydro-energy. Yet the country has no proven crude oil or natural-gas reserves, relying on imports to meet its domestic fuel needs. Its petroleum potential is largely underexplored although a growing interest in hydrocarbons exploration by junior companies has emerged in recent years.

## PRODUCTION AND REFINING CAPACITY

Despite its enormous hydro-energy resource, fuels remain a major Paraguayan import and the annual petroleum consumption is around 10 million barrels. The state-owned oil company, Petroleos Paraguayos (Petropar), is responsible for all crude oil and petroleum imports and operates a single antiquated refinery, Villa Elisa, near the capital, Asuncion. With a capacity of 7,500 barrels per day, it is used primarily for processing imported crude, producing only one-quarter of domestic petroleum consumption. There has long been rampant corruption in the awarding of contracts for sourcing Petropar's fuel supplies. But the prospects for liberalising its monopoly over the domestic oil market are complicated by the difficulty of ending the government's control of domestic fuel prices. Increasingly higher international oil prices since 2005 have placed strict financial constraints on Petropar and in 2007 severe fuel shortages led to renewed calls for the privatisation of the company.

Biofuel production remains limited. There are now six alcohol plants in operation, encouraged by legislation in 2005 requiring minimum bioethanol blend for 85 octane petrol (24%) and for 95 octane petrol (18%). Although about one-third of sugar cane production is now destined for alcohol production, it is still insufficient to meet demand. In response, in 2008 the government introduced a required minimum 1% biodiesel content in domestic vehicle fuel, rising to an eventual 20% maximum. There are currently eight small biodiesel plants in operation but, as in the case of bioethanol, total production is barely sufficient to comply with the initial 1% target.

The state-owned electricity company, Administracion Nacional de Electricidad (ANDE), is the sole provider of power to the domestic market. Although the company has large international debts, its internal management and technical capacity are regarded as better than those at other state-

owned enterprises, and privatisation is strongly opposed. In February 2010, the company came under heavy criticism as the Asuncion metropolitan area was hit by major blackouts caused by years of under-investment in new generating and transmission capacity.

## OIL AND GAS EXPLORATION

Paraguay's petroleum potential is under-explored, despite the proximity of significant oil and gas fields close to its borders in neighbouring Bolivia and Argentina. The existence of hydrocarbon resources in the Chaco has been known for many years. Between 1947 and 1993, exploration companies sunk 26 wells, of which 22 showed positive signs. Four junior companies have been prospecting for oil and gas in the Chaco in recent years: Primo Cano Martinez SA, Morrison Mining SA, Paraguay Gas and Energy, and Bergen-Wiens. Morrison has had a 2,389,850 hectare exploration concession since 2001 in the 'Bloque Boqueron' and Paraguay Gas and Energy SA acquired a 491,000 hectare concession in 2003. Ernst Bergen, a former minister of finance, and a local geologist, Fernando Wiens, are joint owners of Bergen-Wiens, which is exploring for petroleum at Bloque Pirity, Department of Boqueron, very close to the Argentine petroleum field at Palmar Lago. In April 2008 the Paraguayan Congress turned down requests for prospecting licences covering 4,800,000 hectare in the Chaco and eastern Paraguay from six other juniors – Boreal Petroleos SA, Aurora Petroleos SA, Bohemia SA, Crescent Oil, Pirity Hidrocarburos and Haer Hidrocarburos.

Primo Cano Martinez SA, which has held a 40,000 hectare concession since 1983, formed a joint venture with CDS Energy SA, a UK company headed by Daniel Morrison (who is also the owner of Morrison Mining Company) in order to explore for gas in the area known as Gabino Mendoza in the far north of the Chaco. In November 2005 CDS Oil & Gas sank its first well, Independencia 111, at Gabino Mendoza to a depth of 1,600m. In February 2009 CDS stated that two of its shareholders – Feltown Assets Inc and Werton Finance — had bought up equity left by Petro Saudi Ltd., the company that was ready to bankroll its exploration in Paraguay. Feltown and Werton now own 35 percent and 22 percent in the company focused on the Chaco Basin.

In 2008, CDS began a second US\$13 million phase of drilling at Pozo Emilia in the northern Chaco region, near to the border with Bolivia. At stake is the Chaco Basin's three blocks of shale and sandstone between the Andes Mountains and Brazil to the east. But before drilling comes finance, and the new investors will also seek to find CDS the US\$2.25 million in working capital commitments left by Petro Saudi. Feltown and Werton are understood to be negotiating for the working capital and finding partners. In May 2009 CDS posted a statement on the London stock exchange informing that they had found oil reserves amounting to 243 million barrels in the Chaco and its plans to sink a further three exploration wells at Gabino Mendoza at a cost of US\$10-15 million, subject to government approval. To date CDS has invested US\$33 million in oil and gas exploration in the Paraguayan Chaco.

By contrast to the Chaco, at present there is no exploration for oil and gas in eastern Paraguay, although in 2008, UK-based Latin American explorer Amerisur Resources began seismic studies prior to oil exploration in San Pedro Department. In early 2009 Amerisur said new well and survey analysis shows that some 700 million barrels of oil equivalent lie in wait in two Paraguayan basins — both underexplored for historical reasons. With holdings akin to 70 (UK) North Sea blocks, Amerisur has access to the Chaco and Parana basins. Texaco and Shell data from the 1970s and 1980s have been re-examined. It is believed that these properties hold significant untapped resources of oil and gas that may be brought to commercial production,” a statement said. In Parana, two wells more than 25 years ago showed “strong staining with light oil”. The Company intends to farm out an interest in these blocks in return for the acquisition of additional 2D seismic data and the drilling of an exploration well in each block.

## HYDRO-ENERGY RESOURCES

With an estimated reserve of 56,000MW Paraguay, together with Nepal, has one of the highest hydroelectric power potentials per capita in the world. The country produces far more electricity than it consumes, generating massive energy surpluses for export. The development of binational hydroelectricity generation projects - Itaipu, a joint Paraguayan-Brazilian enterprise on the Parana River, and Yacyreta, a joint Paraguayan-Argentine enterprise on the Parana River – has turned Paraguay into the world’s third largest electricity exporter, according to the US Department of Energy’s Energy Information Administration.

Royalty payments from the two binational hydroelectric plants are a major source of state revenue. Receipts from these hydroelectric plants reached US\$615 million in 2007 (US\$420 million from Itaipu and US\$195m from Yacyreta) equivalent to 18 percent of registered exports.

In 1973 the military governments of Brazil and Paraguay signed the 50-year Itaipu Treaty to construct the world’s largest hydroelectric power plant on the Parana River between the two countries. A jointly owned binational power company, Itaipu Binacional (IB) was created to implement the agreement. Construction of the dam began in 1973 and was largely completed in 1984. Between 1984 and 1991 700MW generating units were added at the rate of two or three per year. The last of the 20 turbines came on stream in 2007, giving a total installed capacity of 14,000MW, currently the second largest in the world after the Three Gorges Project in the PRC (18,200MW). In 2008 Itaipu generated around 95 million MWh.

Under the terms of the 1973 Itaipu Treaty, although each country owns 50 percent of the plant’s capacity, Paraguay must ‘cede’ the unused portion of its 50% energy share to Brazil. Sales to third party countries are prohibited under the 50-year treaty, which expires in 2023. Paraguay still only consumes 10% of its half share of the energy production, with its remaining 90% going to Brazil’s state energy utility, Eletrobras. As ‘compensation’, Paraguay receives only US\$2.70 per MWh, equivalent to US\$120m per year. This compares with a wholesale price inside Brazil of around US\$60 per MWh for sales of Itaipu energy by Eletrobras to Brazilian electricity distribution companies and a price of around

US\$100m per MWh paid by Argentine electricity companies to Brazil for energy purchases during its 2007 energy shortage. The very low sale price of Paraguayan energy from Itaipu is clearly delinked from the world price.

Itaipu remains of great strategic importance to Brazil. It fuelled the rapid industrial growth of the Sao Paulo metropolitan area and still supplies 19% of total electricity consumption in the country. The current inequitable arrangement is of enormous economic advantage to Brazil. For over three decades the Brazilian government has adroitly paid off the Paraguayan political and economic elite in order to maintain this lucrative arrangement. Despite the legal obligation for 'alternating directorships', ever since the project came on stream in the mid-1980s the finance and technical directorships of the bi-national hydro company, Itaipu Binacional, have remained exclusively in Brazilian hands and the Paraguayan National Audit Office has not been allowed to examine the company accounts.

In 1973 Paraguay and Argentina signed a treaty to develop the joint Yacyreta hydroelectric project on the Parana River, downstream from Itaipu. A jointly owned binational power company, Empresa Binacional Yacyreta (EBY) was created to implement the agreement. The 1973 treaty may be renegotiated after 40 years (i.e. from 2013). Disputes between the two countries, as well as financing difficulties, led to repeated delays. The first of the twenty 150MW turbines started to operate in 1994 and the final one came on stream in February 1998. However, the project is still not fully operational until outstanding ancillary works are completed to permit the reservoir to reach its optimum depth of 83 metres above sea level. In September 2004 the two governments agreed to complete these works and work began in 2006 on a four-year US\$680m investment plan to increase the electricity-generation capacity. The decision was strongly influenced by energy shortages in Argentina. In early-2010 the reservoir still stood at 78.5 metres above sea level, allowing output of only 60 percent of the plant's 3,200MW installed capacity. Yacyreta currently supplies around 14 percent of Argentina's electricity consumption.

The long delays in construction, corruption in the awarding contracts and lower than expected output have resulted in EBY accumulating an enormous debt of US\$12 billion by 2009, most of which is owed to the Argentine treasury. The servicing of this debt has placed the company under enormous financial strain. At the current energy sale price, revenue at full production would be around US\$800 million, insufficient even to cover the annual interest payments of US\$950 million on the outstanding debt. In 2009 Paraguay received US\$140 million from EBY as compensation for cession of hydro-energy.

Paraguay argues that much of this debt is 'spurious'. This is because it is inflated by accumulated unpaid interest payments resulting from a) the decision of the Argentine government of President Menem to repeatedly postpone infrastructure work needed for completion, thereby causing a loss of income from energy generation, and b) the highly subsidised sale price to the Argentine grid, which accounts for 92 percent of the energy sales of EBY. As joint owner, the Paraguayan government has consequently been trying to renegotiate its share of the debts

with the Argentine Treasury. At the end of 2006 the Argentine government agreed that US\$50 million in compensation would be paid to Paraguay by Yacyreta, but an agreement by Argentine to halve the debt of EBY to its Treasury have yet to materialise. Plans are also under discussion to dedicate two of the twenty Yacyreta turbines exclusively for the domestic electricity market in Paraguay. ANDE needs this extra 300MW supply in order to meet growing demand in the Asuncion metropolitan area.

## THE MOVES TOWARDS RENEGOTIATION

Paraguay's energy policy has long been dominated by a desire to renegotiate the terms of its engagement with Brazil and Argentina over its involvement in binational hydro-energy projects. After the Stroessner dictatorship was overthrown in 1989, Brazil resisted efforts by successive Paraguayan governments to press for renegotiation until President Lugo won the April 2008 presidential election. Renegotiation figured prominently in his campaign, together with a veiled threat to take the matter to the International Court of Justice if no progress had been made within a year of his taking office. As the election campaign progressed, it became apparent that his promise had captured the mood of the population. The other presidential candidates, all of whom had originally criticised Lugo for raising the issue, were forced to reposition themselves behind the call for renegotiation. Lugo also criticised Argentina over the terms of the Yacyreta plant, under which a similar inequitable arrangement exists for the sale of Paraguay's energy share. A national consensus has now clearly emerged inside Paraguay on the issue, uniting opinion right across Paraguay's fractious political spectrum.

In August 2008 the incoming administration of President Lugo presented a table of six demands to Brazil concerning Itaipu:

1. Recuperation of hydroelectric sovereignty (freedom over use of the energy) within the framework of preferential rights and regional integration.
2. A fair price for the energy exported to Brazil.
3. Revision of the debt and elimination of its illegitimate portion.
4. Parity in management.
5. Audit and transparency.
6. Completion of the outstanding works (sectional sub-station and navigation works).

The response of the Brazilian government to Paraguayan demands for renegotiation has been ambivalent. Prior to the election, foreign minister Celso Amorim said that no renegotiation could take place before 2023, when the 50-year treaty expires. And in his congratulatory official message to Lugo, President Lula Da Silva took the opportunity to remind him publicly that renegotiation of the treaty was out of the question. During several subsequent meetings between the two presidents and three rounds of binational talks to consider Paraguay's demands, significant progress was made on points 4, 5 and 6 but successive Brazilian official spokesmen repeated

that movement on the three major demands (1, 2 and 3) was out of the question.

However, at a private meeting after a Mercosur summit in Asuncion on 25 July 2009, Presidents Luiz Inacio Lula Da Silva and Fernando Lugo signed a 31-point aide memoire on Itaipu and related issues. Although less dramatic than some media reports have suggested, Brazil made concessions on demands 1 and 2 that amount to the first ever official recognition of Paraguay's longstanding claims for greater equity in the bilateral relationship over Itaipu.

Demand 1: Paraguay will be allowed to gradually sell its surplus energy directly on the Brazilian power market via its own state electricity company, ANDE, instead of doing so exclusively through Eletrobras, the state-owned Brazilian electricity utility, as at present. Although this could fetch a much higher price, the reported volume involved (300MWh) is only a tiny fraction of Paraguay's current surplus energy sales to Brazil, amounting to 38 million MWh per year. Paraguay will still not be allowed to sell its surplus energy to third countries until 2023 when the treaty expires. Chile is keen to buy energy from Paraguay at a price far above that currently received from Itaipu sales to Brazil. Brazil also agreed that Itaipu Binacional would pay the US\$450 million cost of a 350km 500 kV high-voltage transmission line from the dam to Asuncion to be completed by 2012. The absence of such modern transmission lines has hampered Paraguay's ability to attract energy-intensive FDI and opens up the technical possibility of energy exports to third countries.

Demand 2: The annual compensation payment received by Paraguay will triple from US\$120m to US\$360m. Yet this is still far below the

'just price' that Lugo has repeatedly referred to in his speeches. According to a study by ANDE, the 'just compensation' for the export of Paraguayan electricity to the regulated market of Brazil should be around US\$900 million/year.

There was little movement on Paraguay's third major demand - for a reduction of Paraguay's half-share of the dam's US\$19 billion debt to Eletrobras and the Brazilian treasury. In 1985 Stroessner had agreed to Brazil's request to sell Itaipu's electricity at below market prices to help Brazil tackle its then economic crisis. During four years (1985-89) this lost revenue led to a debt increase of US\$4 billion, which Paraguayan authorities deem illegal. Nevertheless, the Brazilian government did accept that it will study the results of the first ever financial audit of Itaipu Binacional, carried out by the Paraguayan Comptroller-General from January 2009. This is expected to reveal rampant corruption over the past decades.

The Brazilian shift towards a more conciliatory position over Paraguay's demands has been widely attributed to personal chemistry between Lula and Lugo. Of greater significance is the growing concerns of Itamaraty about political instability on its south-western border, which could threaten the security of the Itaipu dam itself. Eastern Paraguay is experiencing increasing cross-border lawlessness and narcotics smuggling, coupled with widespread xenophobia inside the country towards Brazilian soybean farmers. By shoring up the Lugo presidency, Brazil hopes to bring greater stability to its south-western border. On the wider geo-political front, the Brazilian concessions aim to dissuade Lugo from forging greater ties with the ALBA nations (Bolivia, Ecuador and Venezuela).

The move also provided a major boost to the embattled President Lugo. His popularity had plummeted since taking office following his failure to address growing unemployment and crime, together with revelations that he had fathered several children by different women when he was still a bishop. He plans to use the extra revenue to finance a major poverty reduction and social expenditure programme, which is currently frozen because of Congress's recent decision to postpone the introduction of personal income tax. The extra annual revenue of US\$240 million could potentially double central government public investment (\$247 million in 2008). If its use is not tainted by the endemic corruption that still characterises the public sector, the job-creation impact of such a massive boost to public spending could greatly improve Lugo's popularity during the remaining years of his presidency.

## PROSPECTS FOR THE FUTURE

The July 2009 aide memoire was ratified by both countries in notas reversales signed on 1 September 2009. Thereafter it was rapidly approved by the Paraguayan Congress but at the time of writing it has yet to move out of the first of four Congressional committees due to consider it. Hence no progress has been made so far in implementing its key items, which include tripling Paraguay's energy income and the new high-tension power line to Asuncion.

There are growing fears in Paraguay that if this approval is not forthcoming before the Brazilian presidential elections in October 2010, then President Lula's successor may quietly drop the issue. In particular, Law N° 10.438/02, granting Eletrobras exclusive rights to commercialise energy from Itaipu, will have to be reformed. Alvaro Dias, deputy leader of the opposition PSDB in the Brazilian Senate has said they will oppose approval, arguing that Brazilian electricity consumers should not have to pick up the tab for Lula's largesse. However, Brazilian energy specialists believe that tripling payment to Paraguay would have a "relatively small impact" on Brazilian electricity tariffs and planning minister Paulo Bernardo has hinted that the treasury, not consumers, will absorb the extra cost. In December 2009, Dilma Rousseff, former financial director of Itaipu Binacional and President Lula's handpicked candidate to succeed him as President of Brazil, stated to the foreign press that Brazil had made sufficient 'concessions' in the July 2009 aide memoire. She said that Brazil would not consider any further demands from Paraguay for renegotiation of Itaipu. Rousseff also doubted that the Brazilian Congress would approve the agreement soon, given the upcoming presidential election.

As the end of President Lula's term of office loomed closer, President Lugo sought to exert pressure on Brazil to ratify the July 2009 accord. On 28 January 2010 he replaced the Paraguayan leadership within the Itaipu Binacional (IB) company. The reshuffle raised the Paraguayan managerial capacity in IB as well as signalling a victory for the leftist movements supporting the Lugo presidency. Carlos Mateo Balmelli, former Authentic Radical Liberal Party (PLRA) senator and presidential contender for 2013, was replaced as the Paraguayan executive director of IB by Gustavo Codas, who spent many years of exile in Brazil, where he became a leading member



of the Partido dos Trabalhadores (PT), and a key election campaign advisor to President Lula. Codas was hitherto Lugo's main advisor on international affairs. Four of the five members of the Paraguayan directorate at IB were also changed. The new head of finance, Dr. Gladys Benegas, is a respected US-trained economist, whose job will be to administer the tripling in royalties expected if the July 2009 accord comes into force. The new technical and coordination directors, Ruben Brasa and Pedro Mancuello, are also experienced professionals. At the same time, Elba Recalde replaced Carlos Cardozo as the Paraguayan director of the Entidad Binacional Yacyreta (EBY). By increasing the professional capacity of the IB directorate, the reshuffle also signified a strengthening of the Paraguayan negotiating capacity in its efforts to speed up implementation of the landmark 25 July 2009 accord. Within days, Antonio Patriota, a top official from Brazil's Foreign Affairs ministry, arrived to continue negotiations over the implementation of the aide memoire. Although he said that the Brazilian Congress had "a positive attitude" towards its approval, there is still no date fixed for Congress to address the issue.

On 17 February, Codas stated that, 'given the new context' as a result of the 25 July 2009 accord, it was no longer necessary for Paraguay to renegotiate the terms of the Itaipu and Yacyreta treaties. Although this statement was greeted with some consternation by observers who feared that, once again, a Paraguayan government may sell out its core demands to Brazil in exchange for short-term benefits. Yet Codas was addressing a long neglected issue - the abject failure to date of Mercosur, the regional integration body set up in 1990 by Argentina, Brazil, Paraguay and Uruguay, to include regional energy integration within its remit. As Ricardo Canese, Paraguay's leading energy specialist and advisor to President Lugo has pointed out, removing current sales restrictions imposed by the 1973 Itaipu and Yacytera treaties to create a genuinely free energy market in the Mercosur block would greatly increase Paraguay's revenue from electricity exports.

Paraguay is also making strenuous efforts to reduce its current dependence on cheap energy sales to Brazil and Argentina by promoting greater domestic utilisation of its enormous hydro energy resource. In January 2009 President Lugo signed a decree introducing special tariff rates for energy-intensive industries. Attracted by these rates, which are at least 20% lower than elsewhere in Mercosur, Rio Tinto Alcan, a division of global mining giant Rio Tinto, announced plans for a potential US\$2.5 billion investment in an aluminium smelter in Paraguay. In mid-December 2009 it signed a letter of intent with ANDE, to begin negotiations for a power purchase agreement. The smelter, if it is built, would be the biggest private investment in the country's history. Construction would begin in 2014 on the proposed plant, which would come on line in 2016. Projections suggest that the smelter would provide 3,000 direct jobs and produce 485,000 tonnes of aluminium per year using a dedicated transmission line provided by ANDE and financed by Rio Tinto. Negotiations begin in early 2010 and metals strategists consider that a power purchase agreement at a level of US\$25-\$35 per MWh would be necessary. The smelter is expected to use around 800MW of power. ANDE has access to over 9,000MW of installed capacity, of which only 2,000MW is used currently in Paraguay.

After a two year delay, on 15 December 2009 the Brazilian Senate ratified the entry of Venezuela to Mercosur. According to Mercosur rules, all four member nations must approve entry before Venezuela can join the regional economic grouping. Approval from Paraguay now remains a final hurdle to expanding Latin America's largest trade bloc. However there is considerable opposition to such a move among the deeply conservative Paraguayan Congress. This opposition spans the political spectrum and includes virtually all the various factions inside the two main parties (Colorado and Partido Liberal Radical Autentico, PLRA). Only a handful of Congressional representatives belonging to smaller left-wing parties are in favour of Venezuelan entry, in addition to a few opposition members who, while critical of President Chavez, see Venezuela as an important counter-balance to Brazilian hegemony in the regional bloc. Within elite circles there is also hostility to Venezuelan entry. Ever since President Lugo came to power in August 2008, Paraguay's leading daily paper, *ABC Color*, has carried out a relentless media campaign denouncing Lugo's alleged objective of introducing '21st Century socialism' into Paraguay under the aegis of President Chavez. The lack of financial transparency in sales contracts between PDVSA and Paraguay's loss-making state oil refinery, Petroleos de Paraguay, has added fuel to the flames of these accusations. In August 2009 Lugo was forced to withdraw a bill in Congress seeking approval of Venezuelan entry to Mercosur when it became clear that he could not muster the majority needed. Brazil is now likely to exercise considerable pressure on President Lugo to approve Venezuela's entry to Mercosur. Brazil may continue to drag its feet over implementation of the July 2009 accord unless Paraguay changes its stance over Venezuelan entry. However, this could prove a herculean task for Lugo. Although a majority of the membership of the Paraguayan Congress has a well-deserved reputation for venality, and where the sale of votes remains commonplace, such financial arm-twisting would be anathema to Itamaraty and is also far beyond the means of the Presidential slush fund in the 2010 budget. ■