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FEATURED Q&A

Will Peru Harness Hydro to Become a Major Power Exporter?

Q By March, Brazil hopes to finalize a deal for the construction of five hydroelectric plants in Peru, which aim to help supply Brazil with electricity as its economic growth accelerates. Peru could use the power of its rivers to export as much as 90,000 megawatts of electricity annually to Brazil and other countries, according to Peruvian President Alan Garcia. What is Peru's potential as an exporter of electricity? Which countries would be Peru's biggest buyers? What companies are best positioned to profit from Peru's role as an electricity exporter?

approximately 900 miles and that Peruvian electricity demand is growing at a rate of about 500 MW per year, the initial supply is likely to be absorbed by the Peruvian market. Only when most of the total 6 GW is commissioned will it be economically feasible to export electricity. Such exports may benefit Brazil and other neighboring countries, as well as Peru, by reducing their fossil fuels power generation (60 percent in Peru). The feasibility studies of these five plants are almost completed. Their average cost estimate is \$2 million per MW. Although quite preliminary

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A Pietro Erber, a director of Brazil's National Institute of Energy Efficiency and a former director of Eletrobras:

"According to OLADE, the Latin American Energy Development Organization, Peru's total hydroelectric potential is 63 GW, of which only 5 percent has been developed. Around three-quarters of that potential is expected to be economically and environmentally feasible. This sizeable generating capacity is likely to supply both the local and the neighboring countries' markets. Brazilian private investors and Eletrobras, the Brazilian federal power holding, intend to develop 6 GW in five Peruvian sites. The largest, Inambari, with 2 GW, should be the first to be constructed. Considering that the distance from these sites to the closest Brazilian market is



U.S. Ex-Im Bank Commits \$1 Bn to Colombia's Ecopetrol

The chairman of the U.S. Export-Import Bank, Fred P. Hochberg, met with Colombian President Alvaro Uribe (R) to discuss Colombian purchases of U.S. exports resulting from the billion-dollar loan. See story on page 2.

Photo: U.S. Ex-Im Bank.

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ENERGY SECTOR BRIEFS

Brazil's Petrobras Increased Oil, Gas Production 5.1% Last Year

Brazilian state oil company **Petrobras** said Tuesday its domestic oil and gas production was up 5.1 percent in 2009 from the previous year. Production in 2009 averaged 2.29 million barrels of oil equivalent per day, up from 2.18 million in 2008, the company said. Exclusive oil production increased 6.3 percent year-on-year, while natural gas production was consistent with previous year's levels due to lower demand in Brazil, Petrobras said.

Amelot Holdings to Produce Biofuels in Trinidad and Tobago

U.S.-based biodiesel producer **Amelot Holdings** said Tuesday that it plans to establish a new subsidiary in Trinidad and Tobago. The holding company, based in New York, said its **Amelot Oil** unit will open a biodiesel production facility in the Caribbean island nation. Company officials are planning to meet with an equipment manufacturer in Europe next month to discuss the facility's needs.

Brazil's Eletrobras May Issue New Shares to Pay Dividends

Brazilian state-owned utility holding **Eletrobras** said Wednesday it may issue new shares to pay 10 billion reais (\$U.S. 5.6 billion) in overdue dividends, Bloomberg News reported. Having the federal government pay the dividends through a new share issuance is one of the options the company is considering, Eletrobras said in a statement, without naming others. Brazil's treasury secretary said last week the government plans to pay off the dividends, pending since the 1970s, within the next year.

Oil & Gas News**U.S. Export-Import Bank Commits \$1 Billion for Colombia's Ecopetrol**

The U.S. Export-Import Bank announced Tuesday it approved a \$1 billion loan to Colombian state oil company **Ecopetrol** to help finance imports from U.S. companies. Ecopetrol will use the financing to develop oil and gas reserves, increase production at current oil fields and also to upgrade refineries, the Ex-Im Bank said, adding that Ecopetrol aims to increase petroleum production to 1 million barrels of oil equivalent by 2015. "This preliminary commitment will help Ecopetrol expand its production base, contribute to Colombia's economic growth and offer enormous opportunities to U.S. exporters to provide goods and services to this important market," Ex-Im Bank Chairman Fred P. Hochberg said Tuesday during a visit with Colombian President Alvaro Uribe. Ecopetrol said the conditions of the loan had not yet been established. Last year, the Ex-Im Bank approved multibillion-dollar loans to state oil companies in Mexico and Brazil.

Repsol May Mark Down Reserves Due to Bolivia Nationalization

Spanish oil company **Repsol** may mark down as much as 4 percent of its accounted reserves due to their nationalization by Bolivia, wire services reported Tuesday. Last year, the South American country tightened state control over its hydrocarbons, which led companies operating there to review their accounting requirements, Dow Jones reported. The possible markdown of 4 percent of Repsol's reserves would be equivalent to approximately \$7.6 billion worth of reserves at current prices and would amount to about 90 million barrels of oil equivalent, Reuters reported. The measure would be "an accounting note which doesn't affect our business at all," a Repsol spokesman told Reuters. He added the company would continue operating as usual in Bolivia. The accounting move would ensure Repsol does not register Bolivian state assets as its own. Last week, Brazilian

state-controlled oil company **Petrobras** said its total reserves declined 1.5 percent in 2009 as it removed reserves in Bolivia from its accounting.

Power Sector News**Chile's Colbun to Boost Capacity by 800 MW, Supply Power to Codelco**

Chilean power generator **Colbun** plans to expand its generating capacity by 800 MW over the next three years using funds obtained from a recent bond issuance, CEO Bernardo Larrain said Wednesday, Dow Jones reported. Last week, the company sold \$500 million worth of 10-year



Colbun and Codelco executives sealing the deal Wednesday.

Photo: Codelco.

bonds at 237.5 basis points over U.S. Treasuries, expanding the sale from \$400 million on high investor interest. Larrain made the comments at a signing ceremony for two long-term contracts between Colbun and state-owned copper company **Codelco**. Under the 15-year and 30-year contracts, which were awarded in September after an international bidding process, Colbun will provide Codelco up to 510 MW of power and 4,000 GWh annually, the state-owned mining firm said in a press release. "For Chile, too, this contract is a source of investment, which will be important and necessary in the coming years," Larrain said, according to Codelco. "Therefore, we're very grateful in the confidence Codelco has put in us." The two companies also signed an agreement to collaborate on electricity generation using alternative energy sources, said Codelco, which is Chile's largest consumer of electricity.

Biofuels News

Brazil, GE Unveil Ethanol-Fired Power Plant in Minas Gerais

Brazilian President Luiz Inacio Lula da Silva on Tuesday inaugurated the world's first ethanol-fired power plant capable of producing electricity on a commercial scale. Brazil's state oil company, **Petrobras**, partnered with U.S.-based **General Electric** to convert one of the plant's two GE-made gas turbines to run on sugar cane-based ethanol in addition to natural gas, the companies said. "We had a challenge, which was to potentialize the usage of ethanol to produce electricity," Lula said at the plant's opening, according to Petrobras. "The partnership between Petrobras and GE, which already has scale production capacity with this turbine that runs on two types of fuel, is a revolution in electric power." GE said the conversion of the Juiz de Fora Power Plant, which has a total generation capacity of 87 MW and is located in Minas Gerais state, marked a "significant milestone" for Brazil. "As the world's second largest producer of ethanol and the world's largest exporter, Brazil will bene-



President Lula (second from left) at the plant's opening.

Photo: Petrobras.

fit from incorporating ethanol into its thermal generation profile because of the abundant fuel supply," the company said in a press release. GE and Brazilian government officials also stressed that converting power plant to the "flex-fuel" would reduce carbon emissions. GE said the plant would undergo five months of tests to gauge the performance of ethanol and emissions levels. The GE turbine converted to run on ethanol is the same type that is used in aviation, according to the

Featured Q&A

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nary, one may expect that they will be competitive with other power generation sources, mainly if all externalities are taken into account, as they should be. Hence, presently the major issue is not where this power supply will be absorbed, but how it will be implemented. Social and environmental impacts, in particular, should be cautiously evaluated and satisfactorily mitigated or compensated, since ensuing problems may jeopardize not only these investments' performance but also the development of the large Peruvian hydroelectric potential."

A Aurelio Ochoa, director of Energie Consult in Lima and former hydrocarbons director of PetroPeru:

"Before taking up the issue of exportation, we have to analyze Peru's renewable energy potential. For hydroelectric (78 percent of which is on the eastern slope of the Andes), the usable potential is 40 GW (70 percent of the technical capacity). For wind power, potential could reach 20 GW, while for solar and geothermal, it's about 3 GW. Peru's current electricity demand is 4.4 GW, with the reserve margins at about 16 percent. Estimating an annual growth of 7 percent, we would need to install more than 300 MW annually. As a consequence, our potential as an electricity

companies. GE is already pursuing partnerships in Brazil to fuel aircraft engines with other types of renewable fuels like biodiesel.

France's Areva Receives Contract for Brazil Bioenergy Projects

French conglomerate **Areva** announced last Thursday that it has received contracts for two bioenergy projects in Brazil. The company, based in Paris, said its subsidiary, **Koblitz**, signed a contract with Brazilian industrial group **Bertin** for the construction of 11 turnkey biomass plants in the South American country. The wood-fired plants, which will have a capacity of 380 MW electric, will use eucalyptus plantations. The plants' con-

struction is scheduled to last four years. The Areva unit also received a contract to retrofit the power generation unit in Brazil's Seresta sugar mill, which is located in Alagoas state. The upgrades will allow the unit to produce 50 MW electric of electricity, which will be sold to Brazil's electrical grid. The projects, along with a contract for two turnkey biomass plants to be built in Thailand are worth 260 million euros (\$U.S. 366.74 million)

exporter depends on the magnitude and pace of construction of new dams. All of Peru's neighbors would be potentially good customers. Starting in November and continuing through April, Peru has been exporting between 40 and 50 MW to Ecuador. But interconnections to the rest of our neighbors are still lacking. For the moment, we don't have any further capacity for exports. The companies that will benefit most will be those that are the most aggressive commercially, and can count on the wide financial backing that will make hydroelectric projects viable, since they require large investments and prolonged construction time. Currently, the companies best positioned on the eastern slope are the Brazilian firms. However, there is a latent shadow in Peru of the past and current experience of Itaipu, with respect to the cost of excess energy that Paraguay is obliged to sell to Brazil (at \$2.80 per MWh). That same energy can fetch up to \$300 per MWh in Brazil's internal market, while the international referential price is about \$60 per MWh."

A Jose Valera, partner at Thompson & Knight LLP in Houston:

"Peru has great potential as an exporter of electricity. The country's total installed hydroelectric generation capacity today is less than 5 percent of the potential to generate elec-

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struction is scheduled to last four years. The Areva unit also received a contract to retrofit the power generation unit in Brazil's Seresta sugar mill, which is located in Alagoas state. The upgrades will allow the unit to produce 50 MW electric of electricity, which will be sold to Brazil's electrical grid. The projects, along with a contract for two turnkey biomass plants to be built in Thailand are worth 260 million euros (\$U.S. 366.74 million)

Political News

Haitians Pour Out of Capital After Strong Aftershock

A strong aftershock Wednesday morning

led Haitians to pour out of Port-au-Prince by the thousands, pushing their way onto buses and boats in an attempt to escape their earthquake-ravaged capital city. Wednesday's 5.9 magnitude aftershock, centered 30 miles west-southwest of Port-au-Prince according to the U.S. Geological Survey, did not produce immediate reports of additional casualties. However, the death toll from the massive 7.0 magnitude quake on Jan. 12 was so staggering that the living remained unable to find room for all the dead. A sign appeared outside a mass grave at the capital's largest cemetery: "Please. The hole is filled. It can't take more bodies," *The Washington Post* reported. The death toll is 75,000 and rising, said Haitian President Rene Preval. Officials have expressed fears that 200,000 may have been killed in the earthquake, but the final death toll may never be known. The United States and other countries continued sending aid, but the capital's over-taxed airport, destroyed roads and damaged port continued to hamper relief efforts. The U.S. hospital ship USNS Comfort arrived off the coast of Port-au-Prince Wednesday and began accepting a succession of helicopters carrying the injured. About 83 patients were brought onboard, the ship's medical commander, Navy Capt. Jim Ware told *USA Today*.

Pinera Wins Presidency in Chile, Defeating Frei in Second Round

Sebastian Pinera was elected Chile's first right-leaning president since its return to democracy in 1990, defeating former President Eduardo Frei in Sunday's runoff vote. Pinera's inauguration March 11 will put an end to two decades of rule by the center-left Concertacion coalition that has governed Chile since Gen. Augusto Pinochet's dictatorship ended. Pinera garnered 52 percent of the vote Sunday, to Frei's 48 percent, Agence France-Presse reported. In his victory speech Sunday night, Pinera said he would "break down the walls dividing us and build new bridges to bring us together." At a panel discussion at the Inter-American Dialogue on Wednesday, former Chilean ambassador to the U.S. Genaro Arriagada said Pinera is not likely to change the eco-

nomie policies of his center-left predecessors, except for a few "minor adjustments" which could include tax hikes and labor market reforms. One of Pinera's greatest challenges may be alleviating public concerns about his billionaire background, said Arriagada, who ran Frei's successful campaign for president in 1993. Chile's third-richest citizen according to *Forbes* magazine, Pinera controls a major television channel and owns stakes in **LAN Airlines** and Chile's most popular soccer team. After his electoral triumph, the market value of Pinera's principal holding company surged based on earlier promises that he would sell its 26-percent stake in LAN before taking office March 11. Pinera risks losing public confidence if he doesn't immediately resolve these conflicts of interest, Arriagada said. He added it would be a mistake for Pinera to use his links to powerful business and media interests to push his legislative agenda through Congress without negotiating with the Concertacion.

Economic News

Chavez Announces Minimum Wage Hike, Cabinet Reshuffle

Venezuelan President Hugo Chavez last Friday announced a minimum wage hike and a cabinet reshuffle during an annual speech to lawmakers, Reuters reported. Chavez said the government would raise wages 10 percent effective March 1 and another 15 percent Sept. 1. Chavez's announcement came a week after he devalued the country's currency by half for "non-essential goods." Chavez said he had combined the finance and planning ministries under current planning minister Jorge Giordani, and that the former finance minister, Ali Rodriguez, would become electricity minister. That post was vacated last week by Angel Rodriguez, who Chavez fired for faulty management of a power rationing program in Caracas. As a result, the president suspended rolling blackouts in the capital, but rationing continues in other regions. The government instituted rolling blackouts to cope with dangerously low levels at the country's hydroelectric reservoirs, which have been depleted by a severe drought.

POLITICAL & ECONOMIC BRIEFS

Honduras' Zelaya Granted Safe Passage to Dominican Republic

Honduran President-elect Porfirio Lobo and Dominican Republic President Leonel Fernandez signed an agreement Wednesday granting deposed Honduran President Manuel Zelaya safe passage to the Caribbean nation. The agreement allows Zelaya, who was ousted in Honduras' June 28 coup, to go to the Dominican Republic after Lobo takes office Jan. 27. [Editor's note: See related Q&A in the Jan. 15 [issue](#) of the daily *Advisor*.]

Clinton: U.S. Ready to Open Formal Dialogue With Unasur

The U.S. government is willing to open a formal dialogue with the Union of South American Nations on issues including security and defense, Secretary of State Hillary Clinton said in a letter to Ecuadorean President Rafael Correa. In the letter, which Ecuador released Wednesday, Clinton thanked Correa for his earlier request for a dialogue, and asked him to provide a list of potential topics ahead of a meeting of U.S. and Unasur officials.

Official: No Time Remaining for Referendum on Uribe Re-Election

A referendum that voters would have to approve in order for Colombian President Alvaro Uribe to run for a third term could not be held in time for Uribe to stand for re-election, the country's top election official said Tuesday, EFE reported. Carlos Ariel Sanchez, the national registrar, said that even if Colombia's Constitutional Court approves placing a referendum on the ballot within the next month, there would not be enough time to organize and hold it before the May 30 presidential election.

Featured Q&A*Continued from page 3*

tricity with hydro resources. The proposed agreement with Brazil to develop binational hydroelectric projects would be a win-win. Brazil would finance the upfront construction costs and in consideration would withdraw the majority of the generated power. Over time, the power sharing would be shifted to serve Peru's demand. Peru does not have large enough short- and medium-term demand to justify paying for this projects. Brazil will pay for them, benefitting itself in the short and medium term and Peru in the long term. Peru's only existing international electric interconnection is with Ecuador (160 MW). Ecuador is rationing electricity due to severe drought conditions and this interconnection is most helpful. Peru has a healthy balance of thermal and hydro power, and very comfortable capacity reserve margins. Given the sparsely populated areas in the border between Peru and Colombia and the lack of generation and transmission infrastructure in that region, Peru's exports of power to Colombia will most likely be made at some point through Ecuador. As Colombia is also interconnected with Venezuela, it is not inconceivable that Peruvian exports could reach Venezuela. Exports to Bolivia and Chile are more challenging due to the differences in frequency. Peru is on a 60Hz cycle. There are multiple local and foreign power companies currently owning and operating power plants in Peru. Among the foreign companies are Endesa Chile, GDF Suez, Duke Energy and Israel Corp. All such companies, plus Peru's Electroperu and Brazil's Eletrobras, are best positioned to profit from Peru's role as an electricity exporter."

A Gregor MacLennan, Peru program coordinator for Amazon Watch in San Francisco: "Peruvian President Alan Garcia views the Peruvian Amazon as an untapped resource, wasted on the region's indigenous people. His administration is pushing massive development of infrastructure projects throughout the rainforest, from oil drilling and mining

to plantations and road building. These plans have already contributed to unprecedented indigenous protests throughout the Amazon, culminating in violent clashes in Bagua that left 34 dead in June of last year. Now the government is turning to the Amazon basin's hydroelectric potential. Fifty-two proposed dam projects will generate 24.5 GW at a cost of more than \$30 billion. Brazil is one of the main investors, having signed \$16 billion in agreements to construct six dams in the Peruvian Amazon to

“There is a latent shadow in Peru of the past and current experience of Itaipu.”

— Aurelio Ochoa

export energy to Brazil. Brazil is interested in nine additional proposals, which together would flood almost 400,000 hectares and impact another three million hectares. The first two projects are already underway: Inambari in Madre de Dios and Pakitsapango in the high Amazon of the Central Jungle. Pakitsapango will be built on the Ene River, home to over 10,000 indigenous Ashaninka communities and next to Otishi National Park. The dam, the largest in Peru, will flood 73,000 hectares and displace over 20 Ashaninka settlements. Dam construction threatens hundreds of migratory fish species with extinction and studies in Brazil have found the projects can destroy the ecosystem within a 15 mile radius. Decomposing vegetation and deforestation caused by the projects can emit as much greenhouse gas as a fossil fuel plant of the same capacity. As such, dams are not as clean an energy source as proponents make them out to be."

The Energy Advisor welcomes responses to this Q&A. Readers can write editor Gene Kuleta at gkuleta@thedialogue.org with comments.

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