LAD CASE STUDY

Are China's Loans to Ecuador a Good Deal? The Case of the Sopladora Hydro Project

Juan José Lucci

JOHNS HOPKINS SCHOOL of ADVANCED INTERNATIONAL STUDIES

Stanford | CDDRL | Leadership Academy for Development

LAD

ABOUT LAD

The Leadership Academy for Development (LAD) trains government officials and business leaders from developing countries to help the private sector be a constructive force for economic growth and development. It teaches carefully selected participants how to be effective reform leaders, promoting sound public policies in complex and contentious settings. LAD is a project of the Center on Democracy, Development and the Rule of Law, part of Stanford University's Freeman Spogli Institute for International Studies, and is conducted in partnership with the Johns Hopkins School of Advanced International Studies.

Are China´s Loans to Ecuador a Good Deal? The Case of the Sopladora Hydro Project

Introduction

It is March 2011. President Rafael Correa must decide whether to accept a USD 571 million loan from China's Eximbank to build the Sopladora Hydroelectric Project, one of eight hydroelectric projects that his government has proposed to reduce Ecuador's fossil fuel dependency. The Sopladora Project is located on the waters of the Paute River in southeastern Ecuador. It will be the country's first underground hydroelectric plant with a capacity of 487 MW.

Ecuador is in a precarious position; it is running out of crude oil to export and spends much of its dollars importing refined oil to generate electricity. President Correa is determined to change the country's energy picture, but he also knows that Chinese loans entail commercial rates that are often considerably higher than those from multilateral agencies like the World Bank. Moreover, the loan will require Ecuador to sign a pre-sale agreement for crude oil at market price. The loan carries significant risks for Ecuador. First, oil price fluctuations could undermine Ecuador's repayment ability. (In March 2011, a barrel of crude oil sold for USD 80.) Second, increasing its foreign debt could adversely affect Ecuador's dollarized economy and fiscal policy (the government cannot print money in time of a crisis), and third, climate change could result in less precipitation, thereby reducing Sopladora's electricity generation.

President Correa can either accept the Chinese loan with its high interest rate and build Sopladora, or avoid the debt but leave Ecuador dependent on the oil industry both to generate export revenue and for domestic energy use. Since Correa is not willing to meet the requirements of international credit agencies such as the IADB, and because Ecuador has a poor record of repaying foreign debt, he has few options aside from Chinese financing, even with special benefits to Chinese companies. What should President Correa do?

Ecuador's History, Economy and Politics

Ecuador was part of the northern Inca Empire until the Spanish conquest in 1533. Quito, as it was called then, became the residence of the Spanish colonial government in 1563 and part of the Viceroyalty of New Granada in 1717. The territories of the Viceroyalty (Colombia, Venezuela, and Quito) gained their independence between 1819 and 1822 and formed a federation known as Gran Colombia. When Quito withdrew in 1830, the traditional name was changed to the Republic of the Ecuador. The rest of the 19th century saw rivalries between

---

Juan José Lucci conducted interviews and prepared this case under the supervision of Francis Fukuyama of Stanford University. This case was developed solely as a basis for class discussion. It is not intended to serve as a historical record, a source of primary data, or an illustration of effective or ineffective management.

conservatives and liberals, which led the country to extreme polarization and political instability, including frequent coups d'états and dictatorships.

The liberals triumphed with the 1906 Constitution, which abolished Catholicism as the official religion, established secular education, recognized freedom of speech and expression, permitted divorce and barred religious leaders from holding legislative office. However, political instability continued through much of the 20th century, characterized by conflict between democratic and *de facto*-military governments. The dictatorships of the 1970s coincided with an exceptional period of oil wealth, which was managed by the state and made it "independent" from its usual dependence on agro-exporters.[i] These military dictators generally did not acquire the repressive features of the dictatorships of the South American cone (Uruguay, Chile and Argentina) and in some respects could even be called "left reformists."

Ecuador installed its first constitutional government in August 1979, but instability continued through the 1980s and 1990s with 10 governments over those two decades, each with a different "ideological" orientation.[ii]

Amid this political instability and social inequality, Rafael Correa won the election in 2006 by a big margin (Appendix A shows the results of the election). Born into a lower middle-class mestizo family in Guayaquil, Correa studied economics at the Universidad Católica de Santiago de Guayaquil. After graduation, he volunteered to work for a Catholic mission where he helped the poor, established a close relationship with the indigenous community and learned to speak Quechua. Later, he worked as a program director in the Ministry of Education, implementing educational inclusion programs with funds from the IADB. Correa left the country to pursue a Ph.D. in economics at the University of Illinois, where he came under the influence of the left-leaning economist Joseph Stiglitz. Returning to Ecuador, Correa became a professor at the University of Quito, while also advising the government and various international organizations. In 2005, he became the economic minister under President Alfredo Palacio, successfully lobbying Congress for increased spending on health and education.

The oil boom during his first years in power allowed Correa's government to expand social welfare programs to address poverty. Correa was a key ally of Hugo Chávez, entering Ecuador into the Bolivarian Alliance for the Americas (ALBA is its Spanish acronym) in June 2009. He succeeded in reforming the Constitution in 2008 and was re-elected in 2009. At the same time, Correa has also been sharply criticized for seeking to influence the judiciary and for controlling and attacking the media.

Economically, Ecuador divides into three different regions: coastal plantations (which produce bananas, coffee and cacao), sierra farmland (wheat, fruits, vegetables, potatoes) and Amazonas oil. The agricultural style of the coastal companies, lead by Guayaquil and oriented towards large-scale exports, continues to compete with the small farms and businesses of the Sierra (Andes), represented by Quito. This persistent rivalry between regions often determines national policy. In Ecuador, 40% of the active population works in agriculture, 20% in industry, and 40% in the service sector. The most important export products besides oil are bananas, coffee, cocoa, rice, sugar cane, and fish.

Since the return to democracy in 1979, Ecuador's leaders have operated amid continued economic crises resulting from destabilization of the oil economy, the deterioration of domestic production and external trade, and the brutal impact of external debt. In March 2000, the National Congress approved a series of structural reforms, among them adoption of the US dollar as legal tender. Dollarization stabilized the economy and positive growth occurred in the years that followed because of high oil prices and increased non-traditional exports.

Between 2006 and 2010, GDP growth averaged 4.6%, thanks to robust oil prices and important external financing flows. Ecuador, a small nation whose population is just 16 million, is substantially dependent on its petroleum resources, which accounted for 57% of the country's export earnings and 26% of public sector revenues. The oil boom allowed for increased social spending, which helped to reduce the poverty rate from 37.6% to 22.5% during this period.[iii] The Gini Index also declined from 0.54 to 0.47.[iv] Yet, most of Ecuador's wealth remains in the hands of a small minority. This high economic inequality, as well as the social structure that underpins it, can be traced back to the colonial era, well known for its racial discrimination, property patterns, and expressions of Eurocentric cultural dominance.

Ecuador's external debt has been always a taboo subject in policy discussions. One of Correa's first steps as president was to denounce the foreign debt as illegitimate and to refuse to repay credit agencies like the World Bank. During his first years in office, and thanks to high oil prices, Correa was able to significantly reduce Ecuador's foreign debt. Furthermore, on October 2010, the National Assembly approved the Public Finances and Planning Code (Código Organisco de Planificación y Finanzas Públicas) establishing a maximum public debt threshold of 40%. Table I displays Ecuador's external debt from 2000 to 2011.

When Correa took power, Ecuador's foreign debt was around 27% of the GDP, and by 2010 it fell to 19%. Ecuador´s debt with China was only about USD 500 million in 2007, but rose to USD 1.512 billion by 2010. Table II also shows the loans granted to Ecuador by China during Correa´s administration.

Table I. Ecuador's Foreign Debt (2000-2011)

Year	President	Foreign Debt (USD millions)	Foreign Debt as % GDP	Foreign Debt to China (USD millions)
2000	Gustavo Noboa	13,329.122	61.50%	299.899
2001	Gustavo Noboa	14,099.505	62.30%	365.940
2002	Gustavo Noboa	16,214.337	52.52%	402.238
2003	Lucio Gutierrez	16,653.157	44.87%	392.694
2004	Lucio Gutierrez	17,540.099	39.76%	413.844
2005	Lucio Gutierrez	17,402.108	35.02%	483.696
2006	Alfredo Palacio	17,393.170	28.83%	560.797
2007	Rafael Correa	17,863.110	27.20%	756.618
2008	Rafael Correa	15,812.998	22.40%	844.787
2009	Rafael Correa	13,259.193	17.72%	1,197.268
2010	Rafael Correa	14,958.833	19.68%	1,512.799

Source: World Bank Index

Table II. Chinese Loans to Ecuador (2007-2010)

Date	Borrower	Lender	Amount (USD millions)	Project	Interest rate
22 July 2009	PetroEcuador	PetroChina	1,000	PetroEcuador oil advance payment	7.25%
4 June 2010	Government	Eximbank	1,682.7	Coca Codo Sinclair	6.90%
31 August 2010	PetroEcuador	BDC	1,000	80% discretional, 20% related to the oil sector	6%
28 January 2011	PetroEcuador	PetroChina	1,000	PetroEcuador oil advance payment	7.08%
28 June 2011	Government	BDC	2,000	70% discretional, 30% related to the oil sector	6.90%
18 October 2011	Government	Eximbank	571	Sopladora	6.35%

Source: Ministry of Finance Ecuador

Energy Policy

Oil exploitation in the Amazon began in the 1970s. Since then, the national economy has remained highly dependent on hydrocarbons, which accounted for 57% of exports between 2004 and 2010 and 26% of fiscal revenues between 2000 and 2010.[v] However, the remaining reserves will allow the country to continue exporting oil for no more than two or three decades, and net export volumes have already declined by 24% since 2004 as a result of the progressive depletion of the fields. Appendix B displays estimations of Ecuador's oil reserves.

For this reason, transition towards renewable sources of energy is a strategic priority of the Correa government. The development of renewable energies is also justified by the negative impacts of oil extraction on biodiversity, the country's greatest lasting asset. In economic terms, the country's current energy system produces large budget deficits since Ecuador is also a major importer of refined oil to generate electricity (refined oil is the nation's largest import). Appendix C outlines Ecuador´s imports of refined petroleum between 1990 and 2010.

The Correa government's goal is to replace fuel imports with hydroelectric power generation. In 2009, Correa predicted that, "In 2016 we will have seven more inaugurated hydroelectric plants that will practically double the electric power of the country, and will make us the country with the most efficient, environmentally friendly electrical system."[vi] Government data indicates this development would not only save millions of dollars in imports but also allow Ecuador to export energy to neighboring countries, increasing the dollar reserves in a country without monetary independence.

To implement this policy, in September 2006, the National Congress approved the Ecuadorian Investment Fund for the Energy and Hydrocarbons Sector Law (FEISEH) to

prioritize strategic investment projects within the energy sector. This fund also aims to incentivize the construction of new high technology refineries for the processing of gas and crude oil. The fund is supported by oil royalties from the production of oil fields previously operated by the Occidental Petroleum Company (Oxy) and PetroEcuador; it is administered by a commission of five representatives from several public entities and led by the vice president of Ecuador. In 2007, FEISEH invested USD 695.1 million in to two hydro projects (Paute Mazar, and Paute Sopladora) and three refineries. Appendix D displays these investments.

As can be seen in Appendix E, in 2008 75% of Ecuador's energy comes from oil, 22% from hydro, and 1% from other renewables. Correa´s plan, called *Plan Maestro de Electrificación*, envisions the construction of new refineries, wind farms, solar parks, and eight hydroelectric projects. The eight hydroelectric projects are detailed in Appendix F.

Another noteworthy renewable energy project, the Villonaco Wind Farm in Loja Province (with a capacity of 16.5MW) is also expected to be inaugurated in 2013. Total investment for this project is USD 48.3 million. The contractor is also a Chinese company, Xinjian Goldwind Science.

Foreign Policy

From his first term, Correa has maintained close relations with tbe leftist governments of Latin America, particularly with Argentina, Cuba, Venezuela, Bolivia, Brazil, and Chile. At the same time, his relationship with United States has been tense. In 2009, Correa did not renew an agreement that allowed the US to maintain a military base in the port of Manta, calling it a threat to the sovereignty of Ecuador. Further, in 2011, Correa's government declared US Ambassador Heather Hodges a persona non grata and expelled her from the country.[vii]

During those same years, China became one of Ecuador's main allies. Correa lamented: "In 2006, 75% of Ecuadorian oil was going to the United States, for nothing. We now have 50% of the oil committed to China, in exchange for billions of dollars to finance the development of this country."[viii] According to the government, Ecuador and China maintain a strategic alliance based on two principles. The first is respect for international law, including sovereignty, territorial integrity, non-interference and peaceful settlement of disputes.[ix] The second principle is mutual benefit and shared profits. While Ecuador provides the natural resources, China provides financing, technology, and access to training to improve productivity. Ecuador and China also signed 15 bilateral agreements in the fields of security cooperation, science, technology, education and visas.

Oil is Ecuador's main export to China, accounting for 77% of total exports in 2010.[x] China is Ecuador’s main source of tires for cars and trucks (5% of total Chinese imports). Also, China exports to Ecuador motorcycles (parts and finished bikes), as well as other capital goods and electronic devices. About 7% of Ecuador's total imports come from China.[xi] As Appendix G indicates, Ecuador and China have had a very uneven trade relationship in recent years, with Ecuador experiencing large deficits in its non-oil trade balance. According to data from the Central Bank of Ecuador, China contributed the most to the trade deficit; in 2008, 32.92% of the trade deficit with Asia was the result of trade relations with China, rising to 37.42% in 2009.[xii]

The Sopladora Project

The Paute Integral Hydroelectric Complex, Ecuador's largest generator of electric energy, is made up of the Mazar, Molino, Sopladora and Cardenillo hydroelectric plants. Each plant uses water from the Paute river basin to generate energy. The Mazar and Molino plants are in operation while Sopladora and Cerdenillo are waiting on financing to be built. The Paute-Sopladora Hydroelectric Plant was conceived with the following objectives:[xiii]

- Reduce fuel consumption required for electricity generation. This involves not only savings for the cost of fuel but also entails a positive environmental impact through reduced carbon emissions
- Increase electric energy production to an average of 2,452,800 MWh/year
- Decrease consumption of imported electric energy
- Reduce production costs with the consequent reduction of power tariffs on end-users
- Job creation resulting from plant construction, operation and maintenance

The Electricity Corporation of Ecuador (CELEC), created during Correa's presidency, is charged with managing construction, operation, maintenance, and administration of the Paute-Integral Hydroelectric Complex. Therefore, CELEC will oversee Sopladora's construction and administration, including the plant's costs and socio-environmental impacts.

The Sopladora hydroelectric project is located within the provincial limit of Azuay and Morona Santiago, between the cantons of Sevilla de Oro and Santiago de Méndez, and next to the Sangay National Park. Sopladora is to be an underground station situated on the right bank of the Paute River between the Sopladora and Palmira streams. The nearest city is Cuenca, four hours by road, where the administration of Paute Integral is located. Appendix H shows a map of the area.

The Paute River originates from the union of the Cuenca River and the Santa Bárbara River in the southern part of the Ecuadorian Andes. Due to a strong slope of 13 km in part of its descent and a 1,000 m drop, this river is well situated for power generation. The Sopladora plant will take in discharged water from the Molino hydroelectric plant, and release those waters into the Paute River at the height of its confluence with the Cardenillo Chico River.

The plant is expected to generate 487 MW and could contribute 2,770 GWh annually to the national electric system.[xiv] The facility consists of a direct connection between the discharge tunnels of the Molino plant and the loading system of the Sopladora project. The direct connection consists of a flow diversion tunnel that communicates with two discharge tunnels, leading to an underground interconnection chamber that will provide the necessary volume to guarantee the entrance of 150 m3/sec for the operation of the generation system. See Appendix I for a full description of the plant.

The following table describes the general costs of the Sopladora hydroelectric plant:

Table III. Sopladora Costs

Item	Value (USD million)
Civil Work	429.169
Equipment	243.022
Inspection and Construction of Roads	63.000
Total	**735.192**

Source: CELEC

Although the government plan (Plan Maestro) stipulated that construction would start in 2007, the project had no funding by that date and the feasibility studies were not completed by 2008.[xv] The construction contract is scheduled to be signed on March 23, 2011, with work to begin on April 26, 2011.

The contract calls for completion in 1438 days. Chinese and Ecuadorian workers will build the plant. Most of the skilled laborers and managers will be Chinese, with Ecuadorians supplying most of the low-skilled labor.

Studies of the physical, environmental, social, and archaeological impacts of the project were conducted by Hidropaute, a branch of CELEC administering hydroelectric operations in the Paute River. The analysis concentrated on an area of 1,318 hectares surrounding the project, including proposed access roads, camps, cable cars, material sources, and construction methodology. Major findings include:[xvi]

- The plant is classified as "low noise"
- No change in air quality is predicted
- No significant changes in water quality are predicted
- No significant impact on the visual landscape is predicted since the project is largely underground. Moreover, the area's frequent fog and rain will often obscure the surface facilities.
- Selective logging will alter the structure and composition of most of the surrounding forests and thus disrupt the habitat of large numbers of mammals that will be forced to retreat in search of food.
- Pre-construction studies show that Sopladora will not have a significant impact on the number of fish, which is already reduced.

The site is home to a small population of largely farming families in the community of San José de Guarumales. Those most affected will be peasants and other residents of San José de Guarumales, as well as farm owners on the left bank of the Paute River. Ecuadorian authorities affirm that one of the project's priorities is to improve living conditions for the local population and that the impacts will be more positive than negative. Relations with the population are institutionally channeled through parish boards and community leaders. Non-profits, especially international NGOs, are formally excluded from the decision-making process as well as impact mitigation programs. Government officials consider these groups to be "external agents," operating contrary to the government's premise that "politics be conducted by Ecuadorians only."

An archaeological impact analysis was also conducted where remains of vessels were found. A plan was created for the continuous monitoring of soil intervention activities to avoid affecting sites of archaeological interest.

Based on these studies, a socio-environmental management plan was created to prevent, mitigate or compensate for possible impacts. This plan can be found in Appendix J. Also, during construction 15,000 inhabitants within the project's zone of influence will benefit from environmental conservation projects to adapt to climate change, educational infrastructure upgrades, new roads, improvement and equipping of health centers, construction and improvement of drinking water and sanitation systems, strengthening of agricultural and livestock capacities, and training in tourism. All these programs will be executed through CELEC Hidropaute.

Tenders have been conducted for all the energy projects during Correa´s term with the goal of selecting the best company to both finance and build the projects. However, foreign companies did not participate as equity partners in either of the hydroelectric projects during Correa's presidency because, according to government officials, the president wanted to keep full ownership of these projects. At the same time, the opposition parties criticized the Chinese companies for their unwillingness to assume any risk related to the long term operation of these projects.

On August 3, 2009, the tender began for the manufacture, supply, assembly and testing of the electromechanical equipment, and for start-up of the Paute Sopladora hydroelectric plant. By January 2010, four companies had come forward but two Chinese companies, Sinohydro and Gezhouba, were the only ones to offer financing. Sinohydro had defeated Gezhouba in the tender for construction of the country's largest dam, Coca Codo Sinclair, and decided not to participate in the Sopladora contest. Informal sources claimed that Sopladora was the consolation prize for Gezhouba.

On August 23, 2010, through a public act, the commercial adjudication was signed with the China Gezhouba Group Company and the Fopeca Consortium, an Ecuadorian company who aided in the construction of the project. Gezhouba offered a financing proposal that included China's Eximbank. In October 2010, the construction contract was signed. Liu Chuanhu (Gezhouba's representative) stated that CGGC had selected the most experienced engineers to build Sopladora, including workers who had helped build the Three Gorges dam.

Gezhouba is a state-owned company, which is part of the China Energy Engineering Corporation (Energy China). Gezhouba´s expertise in the construction of dams, power plants, bridges, and roads has made the company one of the largest in the world. Gezhouba was registered in 2010 in Ecuador, just months before the signing of the contract.[xvii] Gezhouba is also currently competing for a USD 16,494,495 project to rehabilitate the Cerro Azul tunnel, which is part of the Daule Peripa system.[xviii]

The Deal

The Sopladora project was negotiated by Coordinating Minister of Strategic Sectors Jorge Glass. However, Correa closely followed this process, as he did with the other hydroelectric projects. The Ecuadorian delegation that will visit China to close the agreement will include Minister Glass, Deputy Secretary of Public Credit of the Ministry of Finance William Vásconez, and Eduardo Barredo, manager of CELEC. The delegation will be received by Chinese vice-president Li Yuanchao.

Eximbank's USD 571 million loan offer carries an interest rate of 6.35% (US 6 months LIBOR + 350BP[xix]) over a 15-year term with a 4-year grace period. This loan represents approximately 85% of the total cost of the hydroelectric plant, with the other 15% financed by Ecuadorian sources. Payments are due every six months and include an additional 1% management fee.[xx] Since the deal is between the Ecuadorian government and an international public company, it does not need the approval of the National Congress of Ecuador, as domestic legislation exempts such deals from parliamentary ratification. When the "strategic alliance" between Ecuador and China was signed, Ecuadorian public companies were authorized to sign agreements with international public companies in a "direct way," bypassing the bidding processes required for projects in strategic sectors. This has allowed contracts to be signed on an "express" basis in all strategic sectors.

One requirement of the Eximbank contract is that Sopladora must be built by Chinese companies using Chinese equipment and operated by Chinese labor. Further, loan approval requires Ecuador to sign pre-sale agreements with China for 72,000 barrels of oil per day. This type of loan, referred to as an "oil backed loan," conditions financing on the presale of oil at market price. Funds from the sale of Ecuadorian oil will be deposited in an Eximbank pass-through account, a portion of which will apply to the loan with the remaining funds dispersed to Ecuador. Roughly 60% of these shipments will be handled by PetroChina (the world's second largest publicly traded oil company) and the China National Petroleum Corp.(CNPC). UNIPEC, the marketing arm of state-owned Sinopec Corp., and other Chinese companies will take smaller shares.

This contract is considered a "win-win" since China gets needed hydrocarbons while Ecuador replenishes its government coffers, increases employment, and develops critical infrastructure to sustain future development. Since 2009, the direct sale of oil to China to pay off these loans has steadily grown; both countries currently have three contracts equivalent to a debt of USD 4 billion for Ecuador, which is being amortized with a percentage of each barrel exported.

However, this financing strategy disproportionately benefits the Chinese in at least three ways. First, China is entitled to Ecuadorian crude oil directly and preferentially, precluding Ecuador from bargaining for a higher price based on the world market. Second, the oil serves to guarantee a high interest rate loan. And finally, this loan pays for work done by Chinese rather than Ecuadorian companies and effectively prevents Ecuador from tendering infrastructure work to other international companies that might also want to invest in the country.

Nonetheless, Cai Runguo, a former Chinese ambassador to Ecuador, defended the loan terms thusly: "If interest rates are compared with those of agencies such as the World Bank or the IMF, they are high, but it should be clarified that these are commercial loans and I do not think that Ecuador can find such loans with lower rates in other foreign banks. Among all the credits that the Eximbank has offered to South America, the conditions for Ecuador have been the best. For a credit, there are many conditions, interest is just one of them. The other agencies may offer lower rates, but they have other conditions that the Ecuadorian government cannot accept."[xxi]

Ecuador's Relationships with International Credit Organizations

The Inter American Development Bank
The IADB, unlike the World Bank, has maintained a relationship with Ecuador throughout Correa's presidency. IADB President Luis Alberto Moreno is also a critic of the Washington Consensus and has frequently praised the Correa government. Moreover, the bank has funded projects in Ecuador totaling USD 5 billion that address poverty, education, the power grid, and the environment (see Appendix K).

On the other hand, the IADB did not participate in financing of any of the hydroelectric dams Correa has pursued. The bank requires extensive analysis for projects with strong socio-environmental impacts. These lengthy studies are incompatible with Correa's goal of bringing new facilities online during his tenure. As a Quito-based IADB agent observed, "When Correa wants something, he wants it now, and Chinese loans adapted to this model better than the IADB."

The Corporación Andina de Fomento
The Corporación Andina de Fomento (CAF) is one of the three most important international credit agencies for Ecuador. Between 2009 and 2011, the CAF approved loans in Ecuador worth USD 4.154 billion, which represents an average of USD 831 million per year. In the same period, total disbursements amounted to USD 2.975 billion (9.3% of the total disbursed to shareholder countries), representing an annual average of USD 595 million.[xxii]

The CAF focuses its lending on water and sanitation infrastructure, biodiversity conservation, education and health, and power grid improvement. The agency's procedures are similar to those of the IADB; a loan for the Sopladora hydroelectric plant would have involved a long period of analysis with little prospect of success. However, CAF has been one of the major lenders to the Rio Paute Hydroelectric Complex. Its loan was granted for a 15-year term, including a four-year grace period, and an interest rate of LIBOR 6-months 2.60%. Appendix K includes a list of the major projects the IADB and CAF financed in Ecuador during Correa´s tenure.

The World Bank
Rafael Correa's relationship with the World Bank was complicated even before he took office, dating to 2005 when, as the Minister of Economy, he received an undisclosed loan of USD 100 million. According to the Bank, Ecuador violated one of the requirements for the delivery of credit by modifying the distribution structure of an oil fund in order to allocate more resources to social projects and to reduce the funds destined to service the public debt.

Between 1990 and July 2007, the World Bank provided Ecuador with USD 1.440 billion. During the same period, the Ecuadorian government claims to have paid that organization USD 2.510 billion. This would mean that Ecuador had a negative net balance of USD 1.07 billion with the Bank,[xxiii] yet according to Correa´s government, the World Bank has already been reimbursed. The balance of the public debt with this agency amounted to USD 704.4 million as of November 30, 2007 when Correa suspended payment on Ecuador's foreign commercial debt, declaring it illegitimate and illegal.

The relationship with the World Bank deteriorated further when Correa expelled the Bank's representative in Ecuador, Eduardo Somensatto, accusing him of blackmail, adding, "[t]he more we can repel the IMF and the World Bank, the most responsible actors of the Latin American debacle in the last 20 years, the better we will be. "[xxiv]

Benefits, Risks and Concerns

One of Correa´s key justifications for Sopladora is the project's economic benefit. Although Correa acknowledged that the Chinese interest rate is high, he expected the facility's profits to be around 20% per year, which he termed "good business." According to estimates by the Ministry of Electricity and Renewable Energy of Ecuador, Sopladora will generate savings of about USD 288 million per year because it will replace imported diesel with hydroelectric energy. Increased electric energy production and reduced dependence on external imports are also strategic and geopolitical goals.

Moreover, replacing fossil fuels with hydroelectric energy should cut Ecuador's carbon emissions by an estimated 1.09 million tons of CO_2 per year.[xxv] Environmental protection has been a cornerstone of Correa's rhetoric, and he insists that his government is the first in the nation's history to recognize the challenges that climate change poses for Ecuador's economic and social development.

Finally, a new hydroelectric project could result in more tangible benefits for ordinary Ecuadorians than, for example, cutting Ecuador's foreign debt or government spending. Sopladora will employ thousands of people directly and indirectly and help develop historically poor and neglected regions. Further, reducing the cost of energy production should lead to savings in electric tariffs, benefiting a large percentage of the population.

At the same time, the decision to build Sopladora by taking on Chinese debt also involves several risks. First, because loan payments are tied to the market price of oil, a price drop could significantly hamper the government's repayment ability and lead to large budget deficits and a sharp drop in government spending. However, the current price of an oil barrel exceeds USD 80, and experts predict that it will remain close to that price for the next year. Appendix L displays crude oil prices from 2001 to 2011.

The second big risk is that Sopladora might not produce the expected profits. If Sopladora generates the expected electricity, Correa predicts savings of between USD 130 and 280 million in fuel imports. However, because climate change could decrease the Paute River's flow, and given the high 6.35% interest rate, Correa has acknowledged that profits may be lower than expected.

The significant debt Ecuador will accrue to China is the third risk. After dollarizing, Ecuador cannot devalue its currency, only cut public spending. Therefore, government economic policy recommends minimizing both debt and imports. Further, the country has become more vulnerable to external shocks and could experience serious economic repercussions if, for instance, major trading partners like Colombia or Peru devalue their currency. And the greater the debt, the less margin Ecuador has to manage the economy.

Another concern is that Correa's political opponents repeatedly accuse the president of selling the country to China. Moreover, working class Ecuadorians resent the large number of Chinese workers hired on to infrastructure projects and the fact that the Chinese generally earn higher salaries.

Finally, there are concerns that Ecuador has partnered with a company that has not previously operated in the country, and thus is unfamiliar to the government. Gezhouba was legally registered in Ecuador in 2010, just months before the contract was signed. That contract obligates China only to build Sopladora; it gains no equity in the project and leaves Ecuador with all the construction and operational risks. A complex project like Sopladora, the first underground hydroelectric plant in the country, carries a high risk of accidents which will be borne entirely by the Ecuadorian government.

Corruption is also a concern. Ecuador has a 32-point rating on Transparency International's Corruption Perceptions Index, which ranks countries from 0 (high levels of corruption) to 100 (very low levels of corruption) depending on citizens' perceptions of corruption in the public sector. Over a 10-year period, Ecuador's scores ranged from 20-26 meaning that there was no significant change during Correa's administration. Ecuador currently ranks 127th out of 167, among the most corrupt countries in the world

According to staff at the Ministry of Strategic Affairs, the fact that Sopladora will be awarded to a single company should help improve accountability and the ability of both government officials and project opponents to monitor construction. At the same time, Correa's political opponents together with environmentalists have been critical of the limited transparency during the negotiations and of the loan terms, as well as critical of Chinese companies that generally have a poor reputation for transparency, and have historically padded their cost estimates above market prices in order to pay bribes. Unlike the World Bank or the IADB, which have policies guaranteeing civil society groups access to project information and have established procedures for filing complaints, Chinese credit agencies often exclude citizen participation or control and are generally less transparent.

Conclusions

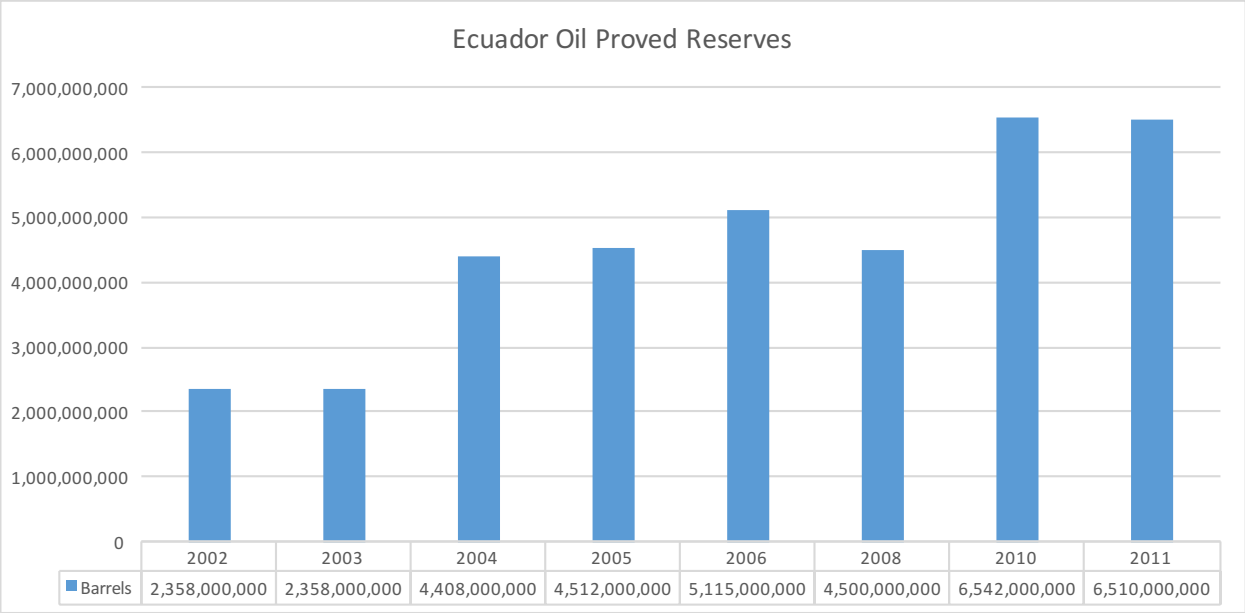
In the coming days, Rafael Correa has to decide whether to accept or reject the Chinese offer. He knows that Ecuador is running out of crude oil to export and spends many of its dollars importing refined oil to generate electricity. In a dollarized country without a monetary policy, reducing imports is key to a healthy fiscal balance. While Correa knows that Sopladora is an important part of the government's plan to replace Ecuador's hydrocarbon-based energy system with a hydroelectric one, he also knows that his options for financing this project are limited and carry high costs and risks. Downsides include the Eximbank's high interest loan, the requirement to use Chinese companies and labor, and the pre-sale of oil at preferential prices. Furthermore, Ecuador must assume all risks for the project in exchange for Chinese financing. On the other hand, Sopladora should prove profitable, yielding earnings well above its costs. Moreover, Ecuador has reduced its external debt in recent years and current oil prices allow for large investments in infrastructure. These investments as well as Sopladora's success should create jobs and foster Ecuador's development as well as burnish Correa's political legacy.

Appendix A - Ecuadorian Presidential Elections Results (2006)

Party	Presidential Candidate	First Round	Second Round (Ballotage)
Movimiento Alianza PAIS, Patria Altiva I Soberana	Rafael Correa / Lenin Moreno	22,84%	56,67%
Partido Renovador Institucional de Acción Nacional	Álvaro Noboa / Vicente Taiano	26,83%	43,33%
Partido Sociedad Patriótica 21 de Enero	Gilmar Gutiérrez / Leonardo Escobar	17,42%	
Izquierda Democrática	León Roldós Aguilera / Ramiro González	14,84%	
Partido Social Cristiano	Cynthia Viteri / Ernesto Dávalos	9,63%	
Movimiento de Unidad Plurinacional Pachakutik-Nuevo País	Luis Macas / César Sacoto	2,19%	
Partido Roldosista Ecuatoriano	Fernando Rosero / Susy Mendoza	2,08%	
Movimiento Reivindicación Democrática	Marco Proaño Maya / Galo Cabanilla	1,42%	
Movimiento Popular Democrático	Luis Villacís / César Buelva	1,33%	
Concentración de Fuerzas Populares	Jaime Damerval / Lida Moreno	0,46%	
Alianza Tercera República	Marcelo Larrea / Miguel Morán	0,43%	
Movimiento Revolucionario de Participación Popular	Lenin Torres / María Pareja	0,28%	
Integración Nacional Alfarista	Carlos Sagnay de la Bastida / Jeannette Benavides	0,25%	

Source: Consejo Nacional Electoral de Ecuador

Appendix B - Oil - Proven Reserves in Ecuador



	2002	2003	2004	2005	2006	2008	2010	2011
Barrels	2,358,000,000	2,358,000,000	4,408,000,000	4,512,000,000	5,115,000,000	4,500,000,000	6,542,000,000	6,510,000,000

Definition of Oil - Proven Reserves: This entry is the stock of proved reserves of crude oil in barrels (bbl). Proved reserves are those quantities of petroleum which, by analysis of geological and engineering data, can be estimated with a high degree of confidence to be commercially recoverable from a given date forward, from known reservoirs and under current economic conditions.

Source: CIA World Factbook

Appendix C - Imports of Refined Oil in Ecuador (1990-2010)

Imports of Refined Oil (1000 Barrels /day)	Year
118	2012
112	2011
121	2010
88	2009
77	2008
80	2007
54	2006
47	2005
45	2004
43	2003
38	2002
33	2001
25	2000
32	1999
34	1998
30	1997
14	1996
18	1995
12	1994
6	1993

Source: EIA

Appendix D – FEISEH Financed Projects

Project: Paute-Mazar
Objective: Increase the energy supply. Generate an extra 160 megawatts.
Financing: USD 165 million

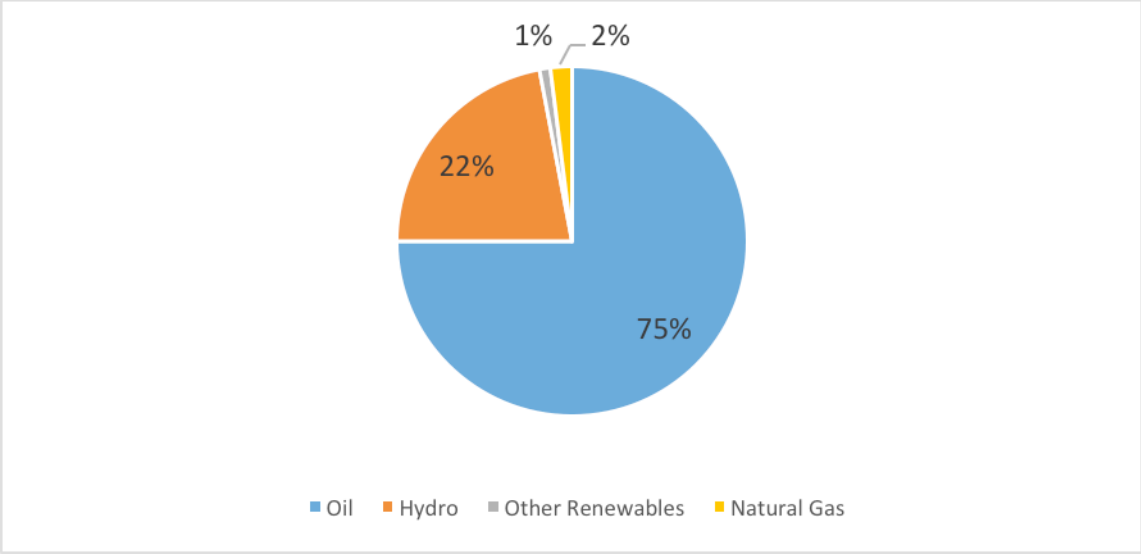
Project: Paute-Sopladora
Objective: Increase the energy supply. Generate 400 megawatts
Financing: USD 228.4 million

Project: Total Renovation of the Esmeraldas Refinery
Objective: Renovate the infrastructure of the Esmeraldas Refinery, minimizing the environmental impact.
Financing: USD 187 million

Project: Renovation and Optimization of the Oil Pipeline System
Objective: Improve the network of secondary pipelines with modern technology to know exactly the percentage of crude oil received by the Petroproducción Amazonian District.
Financing: USD 15.4 million

Project: Renewal of Secondary Branch and Pipeline Systems
Objective: Reduce the risk of oil spills due to external corrosion in the flow lines of oil producing wells and avoid production losses.
Financing: USD 99.3 million

Appendix E - Ecuador's Energy Consumption (2008)



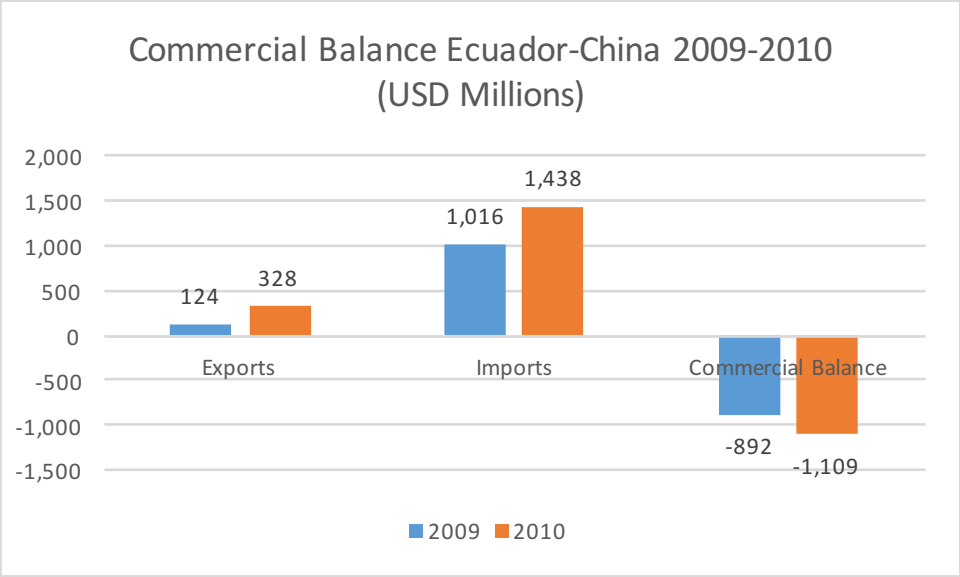
Source: Ministry of Electricity and Renewable Energy

Appendix F - Hydroelectric Projects During the Correa Administration

Project	Energy generation	Location (Province)	Constructor	Investment (USD)
Coca Codo Sinclair	1,500 MW	Napo	Synohidro (China)	2 billion
Sopladora	487 MW	Azuay/ Morona Santiago	Gezhouba (China)	730 million
Minas San Francisco	270 MW	Azuay	Harbin Electric International (China)	506 million
Toachi Pilatón	253 MW	Pichincha / Cotopaxi	China International Water & Electric Corp (CWE) (China)	593 million
Delsitanisagua	115 MW	Zamora Chinchipe	China Hidroelectricidad Ingeniería Consultorio (HidroChina) (China)	194 million
Manduriacu	60MW	Pichincha / Imbabura	Odebrecht (Brazil)	183 million
Quijos	50MW	Napo	China National Electric Engineering Co. (CNEEC) (China)	138 million
Mazar Dudas	21MW	Cañar	China National Electric Engineering Co. (CNEEC) (China)	47 million

Source: CELEC

Appendix G - Commercial Balance Ecuador-China (2009-2010)

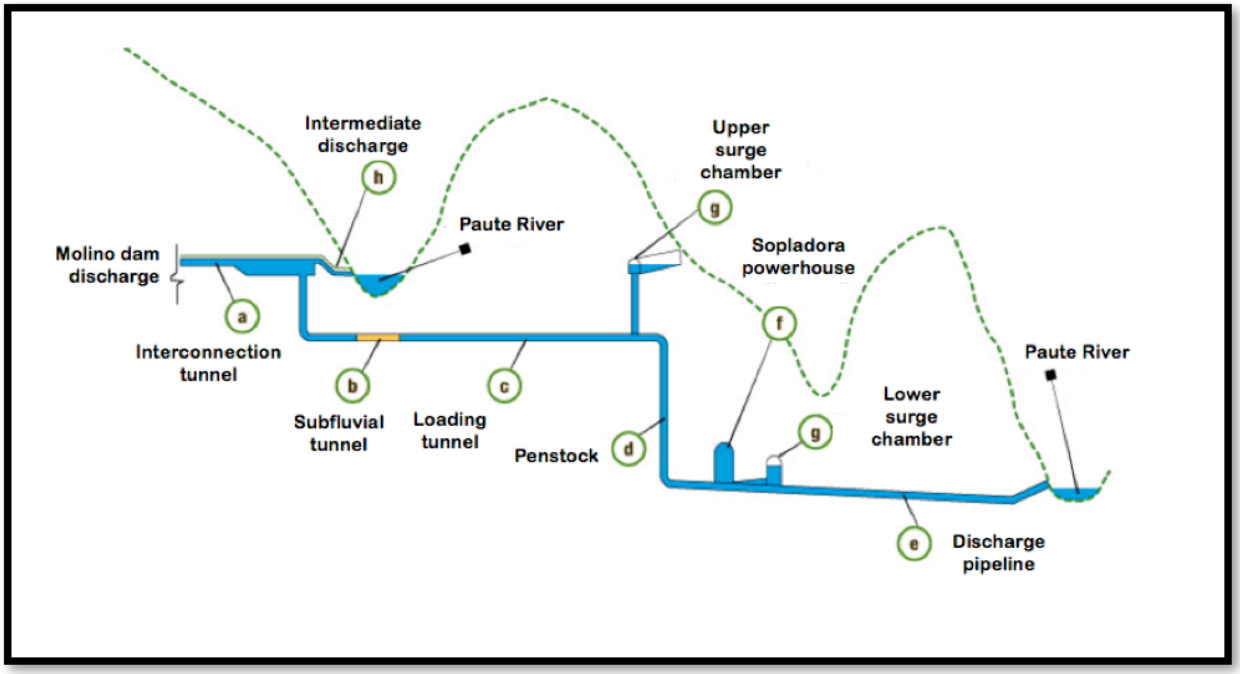


Source: Ecuador-China Chambers of Commerce

Appendix H - Map of the Paute River Basin

Source: CELEC

Appendix I - Sopladora Project



Source: CELEC

Appendix J - Environmental and Social Programs

Policy	Duty	Objective		
		Prevent	Mitigate	Compensate
P1. Environmental Control	• Reporting	X		
P2. Facilities Management	• Prevention of Damages • Regulations	X		
P3. Air Pollution Prevention	• Prevention and Control of Air Emissions • Management of Noise • Management of Electric and Magnetic Fields	X		
P4. Use of Resources	• Use of Materials • Timber • Use of Water	X	X	
P5. Preservation and Protection of Biotic Resources	• Prevention Activities • Conservation of Fauna • Botanic and Floristic Preservation • Forest Compensation • Management of Sangay National Park • Basin Management • Climate Change Research	X	X	X

P6. Mitigation Measures in Specific Areas	• Boat Sites • Road Slope Management • Excavations • Perception and Landscape	X	X	X
P7. Ecological Restoration	• Restoration of the Morphology • Landscaping • Protection and Restoration of the Soil • Re-Vegetation • Evaluation of Restoration		X	
P8. Preservation of Cultural Values	• Archaeological Monitoring • Archaeological Restoration Measures		X	
P9. Communication, Education, and Environmental Training	• Communication and Dissemination • Training for Contractors and Suppliers • Community Training and Training for Hidropaute Staff		X	
P10. Industrial Security and Occupational Health	• Occupational Health • Industrial Security • Signaling	X	X	
P11. Waste Management	• Solid Waste Management Program • Effluent Management Program	X	X	
P12. Social Responsibility	• Direct Effects • Socio-Economic Conditions • Socio-Environmental Management		X	
P13. Contingencies			X	X
P14. Retirement and Abandonment			X	X
P15. Environment Monitoring and Auditing	• Records • Monitoring Programs • Audits	X		

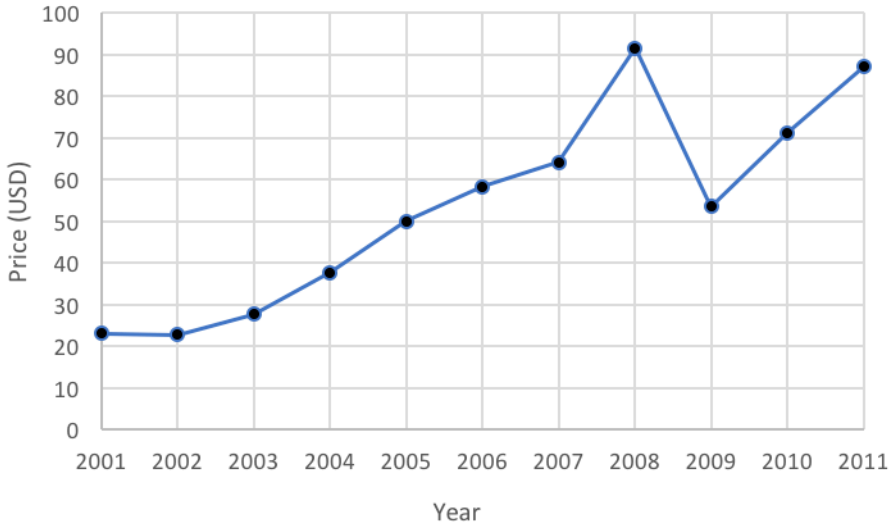
Source: CELEC

Appendix K – Major Loans to Ecuador (2007-2016)

Program	Lender	Period (in years)	Grace (in years)	Date	Interest	Amount (USD millions)
2007						
Free Availability	CAF	18	4	12/9/07	L6m+1,05%	180
Social Sector	CAF	18	4	12/9/07	L6m+1,05%	250
Universalization of Basic Education	BID	25	3.5	12/12/07	L3m+M	246
2009						
Support to the Balance of Payments	FLAR	3	1	7/8/09	L3m+4%	480
2010						
Vial Infrastructure	BID	25	6	2/19/10	L3m+M	350
Electric Sector Investment	CAF	12	1.5	3/19/10	L6m+1,8%	250
Road Projects	CAF	18	4	3/23/10	L6m+2,4%	255
Hydroelectric Coca Codo Sinclair	Eximbank China	15	5.5	6/3/10	Fixed 6,9 %	1,683
Free Availability	China Development Bank	4	6	8/31/10	Fixed 6 %	1,000
Social Sector Investment	CAF	12	1.5	11/30/10	L6m+2,3%	250
PROMADEC	CAF	18	4	11/30/10	L6m+2,4%	300
2011						
Hydroelectric Toachi Pilatón	Eximbank of Russia	11	4	4/12/11	Fixed 7,9 %	123
Free Availability	China Development Bank	8	2	6/27/11	Fixed 7,159 %	1,400
Free Availability	China Development Bank	8	2	6/27/11	Fixed 6,253	600
Hydroelectric Paute-Sopladora	Eximbank China	15	4	10/13/11	Fixed 6,35	571
Public Administration Reform	BID	25	5.6	12/15/11	L3m+M	250
2012						
Support to the Balance of Payments	FLAR	15	3.5	8/31/12	L6m+2,6%	514
Hydroelectric Manduriacu	BNDES	10	3	11/14/12	L0,78%+2,5 %	90
Quito Metro	European Investment Bank	20	6	11/28/12	2.99%	259
Free Availability	China Development Bank	8	2.3	12/20/12	Fixed 7,1917%	1,400
Free Availability	China Development Bank	8	2.3	12/20/12	Fixed 7,1917%	300
Free Availability	China Development Bank	8	2.3	12/20/12	Fixed 6,8717%	300
2013						
Cuenca Tram	Government of France	15	5.5	1/28/13	0	122
Low-Cost Housing Development	BID	25	14	3/15/13	L90+M	100
Hydroelectric Minas-San Francisco	Eximbank China	15	4.5	4/10/13	L6m+4%	312
Control Inundations Cañar and Naranjo	Bank of China	14	4	7/31/13	L6m+3,5%	299
Trasvase Daule Vinces	BNDES	10	3	8/21/13	L6m+2,5%	137
Termogas Machala	Eximbank of Russia	14	3	10/29/13	Fixed 7,45 %	195

Quito Metro	IBRD (World Bank)	29	15	11/11/13	L6m+0,46%	205
PROMADEC	CAF	15	4	12/3/13	L6m+2,6%	275
Public Services Quality Improvement	BID	25	13.5	12/3/13	L3m+M	270
2014						
Transport FAE	Deutsche Bank	9	2	1/30/14	L6m+3,25%	117
Hydroelectric Manduriacu	Deutsche Bank	4	1	4/5/14	L6m+2,35%	50
Free Availability	Goldman Sachs	3		5/16/14	L3m+4 %	400
Free Availability	Bonds 2024	10		6/20/14	7.95%	2,000
National Transmission System	AIDB	25	13	6/23/14	L3m+0,94%	150
National Distribution System	AIDB	25	13	7/31/14	L3m+0,94%	220
PetroEcuador	Noble Americas	5	0.5	9/8/14	L3m+5,63	1,000
Free Availability	FLAR	3	1	9/9/14	L3m+3,11	617
Free Availability	Credit Swiss	7	1	10/27/14	L3m+5,52	100
Transmission System 500 KV	Eximbank China	15	3	10/29/14	L6m+4,2%	509
Water and Sewage	AIDB	25	13	11/14/14	L3m+M	150
Production Matrix Change	CAF	15	3	11/18/14	L6m+2,1%	120
Highways	Bank of China	13	3	11/24/14	L6m+3,5%	312
Educative Infrastructure	CAF	12	3	11/25/14	L6m+2,05%	176
Public Real State Projects	BEI	20	5	12/1/14	L6m+0,71	124
National Distribution Services	CAF	15	3	12/5/14	L6m+2,1%	200
2015						
Support to Change Energy System	AIDB	20	12	2/5/15	L3m+0,9%	500
Free Availability	AIDB	6	3	2/5/15	L3m+2,55%	300
Radars	Deutsche Bank	11	2	2/26/15	L6m*2,75%	88
Free Availability	Bonds 2020	5		3/24/15	10.50%	750
Free Availability	Bonds 2020	5		3/24/15	10.50%	750
Highways	Bank of China	13	3	3/31/15	L6m+3,5%	85
Contingencies	AIDB	25	5	6/16/15	L3m+0,9	300
Quito Metro	CAF	15	3	6/26/15	L6m+2%	250
Energy Sector	CAF	15	2	7/14/15	L6m+2%	400
2016						
PetroEcuador	Bank of China	5		1/22/16	L6m+6,2%	970
Educative Reform	IBRD (World Bank)	18	4	1/28/16	L6m+1,55%	178
YACHAY	Eximbank China	20	5	2/25/16	3 % AF	198
Mitigate Emergency Risks	IBRD (World Bank)	35	18	4/22/16	L6m+1,65%	150
Free Availability	China Development Bank	8	2	4/29/16	7,25 % AF	1,500
Payment to Constructors	China Development Bank	8	2	4/29/16	6,8717% AF	500

Appendix L – Crude Oil Prices (Annual Average) 2001- 2011



Source: U.S. Energy Information Association

Endnotes

[i] Ecuador´s main exports were bananas, cacao, coffee, crustaceans, processed fish, and gold.
[ii]The case of Abdalá Bucaram (1996-97), a populist leader of the "Partido Roldosista Ecuatoriano," is a great example. Bucaram was unseated after 6 months in power by a congressional decision, which found the president's "mental incapacity" a legal cause to remove him from office. Bucaran was succeeded by several Congressional appointees: Rosalía Arteaga took power for a few days (first female President in Ecuador); Fabian Alarcón (1997-98) came next. In 1998, a National Assembly was convened to draft a new Constitution. In the same year, voters put Christian Democrat Jamil Mahuad into office (1998-2000) but he was ousted after 15 months, and succeeded by Gustavo Noboa.
[iii] Instituto Nacional de Estadísticas y Censos. Gobierno Nacional de la República de Ecuador, http://www.ecuadorencifras.gob.ec/pobreza2/.
[iv] *Ibid.*
[v] Mateo, J. P., & García, S. (2014), El sector petrolero en Ecuador. 2000–2010 Problemas del desarrollo, 45(177), 113-139.
[vi] "Ecuador suscribe contrato con empresa china para construcción hidroeléctrica," *El Tiempo*, 6 October 2009.
[vii] "Ecuador expulsa a la embajadora de EE UU por un cable de Wikileaks," *El País*, 6 April 2011.
[viii] "Presidente Correa dice que relaciones del Ecuador con China ´son estratégicas y complementarias,´" *Andes,* 6 January 2011, http://web.archive.org/web/20131225064434/http://andes.info.ec/2009-2011.php/?p=72692.
[ix] *Ibid.*
[x] "How China took control of an OPEC country's oil," *Reuters*, 26 November 2013.
[xi] PRO ECUADOR, Instituto de Promoción de Exportación e Inversiones, www.proecuadpr.gob.ec.
[xii] *Ibid.*
[xiii]Ministerio de Electricidad y Energía Renobable, http://www.energia.gob.ec/sopladora/.
[xiv] *Ibid.*
[xv] "Hidroeléctricas con retrasos de dos años," *El Comercio,* 30 Nov 2011, http://www.elcomercio.com/actualidad/negocios/hidroelectricas-retrasos-de-anos.html.
[xvi] "Plan de Manejo Ambiental Central Paute Sopladora," CELEC, https://www.celec.gob.ec/hidropaute/images/Ambiente/PMA.SOPLADORA.PDF.
[xvii] PRO ECUADOR, Instituto de Promoción de Exportación e Inversiones, http://www.proecuador.gob.ec/2013/02/13/empresas-chinas-crecen-y-acaparan-la-obra-publica/.
[xviii] Secretaría del Agua del Ecuador, http://www.agua.gob.ec/senagua-entrega-usd-17275-85896-para-obras-en-el-tunel-cerro-azul/.
[xix] LIBOR is a common interest rate benchmark that is used to provide a lending baseline for loans ranging from home mortgages to sovereign wealth debt. A group of London-based banks define LIBOR based on their approximation of what an inter-bank lending rate would be.
[xx] According to the Ministry of Electricity and Renewable Energy, this is the standard fee banks charge for this type of transaction.
[xxi] "Ecuador recurre a vigorosa inversión china," *BBC Mundo,* 24 July 2010.
[xxii] Corporación Andina de Fomento, https://www.caf.com/es/paises/ecuador/.
[xxiii] Committee for the Abolition of Illegitimate Debts, www.cadtm.org.
[xxiv] "Presidente Correa acusa a Fondo Monetario y Banco Mundial de "debacle" en Latinoamérica," *Ecuador Inmediato*, 21 October 2007.
[xxv] CELEC HIDROPAUTE, www.celec.gob.ec.