

Legal and Economic
Analysis : Development of
Hydro Power Plant(HPP)
projects in Peru

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LEGAL AND ECONOMIC ANALYSIS FOR THE DEVELOPMENT OF HYDRO POWER PLANTS PROJECTS UP TO 20 MW IN PERU

Date: December 26th, 2011

I. OVERVIEW OF THE LEGAL AND REGULATORY PROVISIONS FOR THE ELECTRICITY SECTOR IN PERU INCLUDING THE PROMOTION OF RENEWABLE ENERGY

1.1 Peruvian Electricity Sector Structure

In the early nineties, the Peruvian government began a process of modernizing the state and brought around a profound change in the economic model, in the context of the enactment of a new political Constitution. The electricity sector was also included in this restructuration, because until then it was in complete public control, in charge of a state holding company which concentrated the generation, transmission and distribution activities; this reform included promotion to private investors and economic regulation by regulatory agencies.

With this objective, the market was segmented vertical and horizontally, giving way to intensive promotion of private investment through the privatization of public enterprises and concessions to private companies to perform activities relating to generation, transmission and distribution of electricity. Consequently, it issued various rules and regulations (the same as summarized below) that seek to promote competition by creating a free market in generation activity, and price regulation in transmission and distribution activities.

As mentioned before, the electrical industry in Peru is now segmented into three sub sectors:

- **Generation:** It consists in the production of electricity, which basically comes from hydroelectric, thermal (simple cycle and combined gas, coal, diesel oil and residual oil) and biomass power plants; and the currently development of solar and wind power plants.

- Transmission: The activity by which the energy produced by power plants is reliably transported to consumption centers (for Regulated and Large Consumers).
- Distribution: The activity by which electricity is taken from the substations of the transmission system of high and very high voltage to the Regulated Users.

It is necessary to precise that in Peru there are two types of electricity consumers:

- Regulated consumers: They are subject to price regulation on the basis of energy and power consumed. They must have an annual peak demand of 200 kW, above which it is possible choosing to be a Large Consumer.
- Large Consumers: They are not subject to price regulation and can freely negotiate the prices of energy and power they consume. Consumers that have an annual peak demand between 200 kW to 2,500 kW, are entitled to choose between the statuses of Regulated or Large Consumer, while those consumers whose annual peak demand is greater than 2,500 kW, are necessarily Large Consumers.

Furthermore, in the Peruvian electricity sector some other main actors also interact:

- Ministry of Energy and Mines (MINEM, by its Spanish acronym): The governing body in the Peruvian energy and mining sectors, formulating policies and regulations on these sectors, with normative and supervision powers. Also acts as a grantor of electrical rights in representation of State.
- Supervisory Agency for Investment in Energy and Mining (OSINERGMIN, by its Spanish acronym): The State regulatory agency in the energy sector, with powers of control and supervision of electrical activity, also has tariff-setting powers, the faculty to regulate the sectors of its competences, and settlement of disputes between electricity market participants.
- Committee of Economic Operation of Interconnected Electric System (COES, by its Spanish acronym): A nonprofit private entity, designed to coordinate the secure and efficient operation of electric national grid, ensuring the best use of energy resources. It is also the Spot Market

administrator, and has the faculty of electric transmission planning. Its members are the generation companies, electric transmission companies, electric distribution companies and Large Consumers¹.

1.2 Regulatory Framework

1.2.1 Law of Electrical Concessions (Decree Law N° 25844) and Regulations

It introduced the reform in electric market structure, as was mentioned before, establishing a free market regime in the generation segment, and a system of rate regulation for segments of transmission and distribution electricity segments.

In Peru, there is not such a figure of a pure electricity trader, therefore the only authorized to trade electricity with Large and regulated consumers are generation and distribution companies, respectively².

1.2.2 Law to Ensure the Efficient Development of the Electric Generation (Law N° 28832) and Regulations

Introduced reforms to ensure sufficient power generation to reduce the exposure to the volatility prices and the risk of electric rationing, ensuring at the same time competitive tariffs for the Regulated Users. Another objective of this Law is to reduce administrative intervention in the power prices by entering the bidding mechanism for distribution companies, to attend the demand of the regulated market. The objective of these changes is introducing more competition in the power market.

It also reformed the conformation and operation of COES, giving the right for distribution companies and Large Consumers to be part of this entity. It also granted to COES the faculty of electric transmission planning.

Finally, this law determined a new design of Spot Market, allowing the participation of Large Consumers and distribution companies (to attend the demand of its Large Consumers)³:

¹ As we explained previously, in Peru Large Consumer are those that are not subject to price regulations for energy or power they consume.

² Distribution companies can also sell electricity to Large Consumers, but only to those that are located within its concession area.

Authorized to sell:	Authorized to buy:
a. Generation companies, to the limit of capacity of their power plants and/or what they have agreed with other generation companies.	a. Generation companies to attend their power purchase agreements (PPA), except: (i) contracts to supply energy with renewable resources and (ii) contracts of distributed generation companies with distribution companies or Large Consumers.
b. Generation companies owners of power plants with renewable resources, to the extent of the capacity that can be generated by their plants.	b. Distribution companies to attend their Large Consumers.
c. Cogeneration and distributed generation companies up to the amount of free surplus.	c. Large Consumers to attend their own requirements.

As for transmission, this Law modifies the conformation of the system, which until then consisted of the Main Transmission System and Secondary Transmission System, incorporating the Guaranteed Transmission System (GTS) and the Supplementary Transmission System (STS).

Despite the new denominations, conceptually there is not a change in the transmission system. The Main Transmission System is the same than GTS, and the Secondary Transmission System is the same than STS. The only difference is that the commissioning of GTS and STS for commercial operation is produced on a date after the promulgation of Law N° 28832. Meanwhile, the installations of the Main Transmission System and the Secondary Transmission System are those qualified as such under the Electrical Concessions Law and the commercial operation commissioning has been produced before the promulgation of Law N° 28832.

³ The legal framework applicable to Spot Market is in development, and it is estimated that may be operational from 1 January 2014. To date, it was published the Spot Market Regulation (by Supreme Decree N° 027-2011), which will come into force on the aforementioned date, being in drafting and approving the technical procedures necessary for its implementation.

Additionally, it establishes that the development of the GTS is made under a Transmission Plan prepared by COES and approved by MINEM; these facilities are given in concession, under a competitive bidding process. While STS facilities are those that although are included in the Transmission Plan, its construction depends of private initiative, also STS facilities are those that are not included in the Transmission Plan.

1.2.3 Emergency Decree to Ensure Continuity in the Provision of Electric Service (Emergency Decree N° 049-2008)

Establishes a temporary regime (until 31 December 2013) where power and energy demands, for supplying the consumption of Regulated Consumers with no contractual support will be assumed for power companies to Busbar Tariffs⁴ in proportion to its Annual Firm Efficient Energy⁵, less energy sales by contracts.

The additional variable costs incurred by each generator, in relation to the Busbar Tariff will be included in the toll for connection to Main and Guaranteed Transmission System.

It also provides temporary and exceptional rules for Spot Market, which will last until the entry into force of the “Spot Market Regulation”, on 1 January 2014.

The short-run marginal costs are determined ideally, assuming that there are no restrictions on production and transportation of natural gas or electricity transmission constraints. This short-run marginal cost may not exceed a defined value by MINEM (set in approximately US\$ 116.75): thus, the actual variable costs that exceed the idealized marginal cost are included in the toll for connection to Main and Guaranteed Transmission System.

1.2.4 Legislative Decree for the Promotion of Investment in Electricity Generation with Renewable Resources (Legislative Decree N° 1002) and its Regulations

Created a special scheme for generation plants that start their commercial operation from May 2 2008, whose primary energy source is renewable, in accordance with the provisions of this Legislative Decree.

⁴ The Busbar Tariff covers only the generation price for regulated consumers; it does not include the transmission or distribution prices.

⁵ It is the Annual Firm Energy of each power plant resultant of order the Annual Firm Energy of all power plants according to their variable costs.

For this Legislative Decree are considered Renewable Energy Resources (RER) to the biomass, solar, geothermal, tidal and hydropower (in this last case when the installed capacity is not greater than 20 MW). Accreditation is required by MINEM to have the benefits from this special regime.

RER power plants have priority in the dispatch made by COES, for which a variable cost is considered equal to zero.

It includes a regime by OSINERGMIN biddings, which are held every two years according to an evaluation by MINEM. With this framework, the bidding winners can supply their energy in the Spot Market at the price resulting from this market, supplemented by a bonus awarded by the State, if the resulting price in the Spot Market is less than the price determined at the bidding conducted by OSINERGMIN.

In paragraph 4.2.1 there is a more detailed explanation regarding this specific regime.

1.2.5 Antitrust and anti-oligopoly Law in the Electricity Sector

It states that vertical mergers equal to or greater than 5%, or horizontal mergers equal to or greater than 15% in the generation, transmission and distribution of electricity markets shall be subject to an authorization by National Institute of Competition and Intellectual Property (INDECOPI, by its Spanish acronym), to avoid concentrations that may affect the competition in electricity market.

1.2.6 Standards for Environmental Conservation (Supreme Decree N° 029-94-EM)

The State designs and implements policies and rules necessary for the proper conservation of the environment and cultural heritage of the nation, in addition to ensuring the rational use of natural resources in the development of electrical activities.

It sets out the responsibilities of the entitled in the control and protection of the environment. It is required to submit an annual report signed by an Environmental Auditor (registered in MINEM's records), reporting on compliance with environmental standards. However, it is important to know that for hydropower plants with installed power under 20 MW, it is not required to

prepare a specific Environmental Impact Study. In these cases, the only obligation is to comply with the regular and general environmental standards.

It should be noted that for generation projects that may affect protected natural areas, MINEM require the prior opinion of National Service of Protected Natural Areas by the State (SERNANP, by its Spanish acronym).

II. LEGAL AND FINANCIAL PREREQUISITES FOR THE FORMATION OR THE ACQUISITION OF A PROJECT COMPANY FOR DEVELOPING, BUILDING AND OPERATING A HYDRO POWER PLANT BY FOREIGN SPONSORS

2.1 Possible legal forms and recommendation for the appropriate choice of a specific company type

2.1.1 Legal framework applicable to companies in Peru

The Peruvian General Corporation Law (LGS, by its Spanish acronym) has provided a general scheme applicable to companies regard to the system of contributions, shares, and administrative bodies. It is worth highlighting the following:

- The LGS companies are generally required to be constituted by at least two partners or shareholders, who may be individuals or corporations, Peruvian or foreign.
- The LGS does not require a minimum capital for the establishment of a company.
- All companies must have a status, name, subject and address.

Despite the different types of companies under the LGS, we will detail the main characteristics of the most used types:

Stock Company: Must have at least two shareholders, regardless of whether they are individuals or corporations, domestic or foreign.

Capital Stock is represented in shares and is composed of the contributions of the shareholders. All shares must have the same value. However, there may be several classes of shares. The difference between the shares of each class depends of the rights they grant to their holders, in the obligations arising for them, or both at once.

The General Shareholders' Meeting (JGA, by its Spanish acronym) is the supreme organ of the Stock Company and, therefore, is responsible for making the major decisions.

The management company has two main bodies: the Board and General Manager. The Board is the administrative and representative organ of the company, and is responsible for developing administrative policies generally. For its part, the General Manager is responsible for executing general administrative policies of the Stock Company, both set by the Board and the JGA, as determined by the same General Manager.

Closed Stock Company: Is a special form of Stock Company. Its main particular characteristics are:

- The name of the corporation must end with SAC (by its Spanish acronym).
- Cannot have more than twenty shareholders, nor having shares registered in the Stock Market Public Registry.
- In a SAC, transfer of shares is subject to preferential rights of the other shareholders, who are entitled to acquire previously they are offered to a third party. Also, the SAC statutory can establish consent or prior approval for any transfer of shares.
- The Board is optional. In this case is mandatory to have a General Manager, who will assume the functions that the Board would, in addition to all those regularly assigned to a General Manager.

If a Board is designated, there is a minimum of three members; the maximum is established by the JGA. Apart from the General Manager, there is the possibility to determine more legal representatives for the company, although the main responsibility lies in the General Manager.

- There is the possibility that the statutory provides grounds for exclusion of the partners.

Opened Stock Company: Is a special form of Stock Company. Its main particular characteristics are:

- The name of the corporation must end with SAA (by its Spanish acronym).

- There must be a public offering of shares.
- Must have more than seven hundred fifty shareholders.
- More than thirty-five percent of its capital belongs to seventy percent or more shareholders.
- Their shares must be registered in the Stock Market Public Registry.
- This kind of corporation is supervised and regulated by Superintendence of Stock Market.
- It is mandatory to have an annual audit by external auditors.

Limited Liability Company: Is designed for small or medium family companies or for those in which the personal aspect of the partners is important. Its main characteristics are:

- It is obligatory to have between two and twenty partners.
- The share capital must be composed of assets (including cash contributions).
- The capital is divided into participations, which cannot be represented in circulation titles (stock certificates).
- Partners have the acquisition preferential right of participations.
- The governing bodies of this kind of company are the General Partners Meeting and the General Manager.

2.1.2 Recommendation for the appropriate choice of a specific company type

For projects of the magnitude such as Las Orquideas power plant, and assuming that this would be the only project to be developed by the company, the recommended choice for is the Closed Stock Company, because in this kind of companies is very important to know and control who the partners are, given that the compliment of the company objective depends very much of knowledge of the shareholders about the business.

2.1.3 Procedures for the constitution of a company

Here are the procedures to constitute a company and the activities required to carry-out before the start of operations:

- Preparation of the minutes of social constitution and the statute. These minutes must be taken to a Public Notary of Lima, to convert them into a public documents; therefore, these documents must be taken to Public Records of Lima to be registered (this registration process takes approximately seven business days).
- If the General Manager is foreign, he or she is required to acquire a valid work visa (obtained in Peru or in their country of origin).
- Request for Taxpayer Registration, which is the tax ID of the company. This process takes approximately five business days.
- Once you determine the location in which the company will develop its activities, it would proceed to obtain the respective operating licenses for the new corporation.

2.2 Costs and financial issues

This section provides information about general economic and financial requirements for the constitution of a company for the development of a hydro power plant project⁶.

2.2.1 Starting a business

The creation of a company for the development of a hydroelectric project, begin on the formal and legal registration of the company, the kind recommended above was the Closed Stock Company. The developer must provide a minimum capital of US\$ 380 (1,000 *Nuevos Soles* in local currency) and thus obtain legal status and be able to start all proceedings involving the project.

Legal and registration costs for the processing of registration for a project in the order of 20 MW are estimated in US\$ 3,000, considering the preparation of the minutes of constitution, legal documents, corporate books and public records processing. Additionally, the developer shall process the Taxpayer Registration and open accounting books (which cost about US\$ 500 including registration).

⁶ The amounts considered in this report have been estimated including the General Sales Tax (IGV) which taxed at 18% the sale of goods or services.

Once the company is registered and formally constituted, this should bear full accounting of all costs of development. In order to carry out financial operations the company must have bank accounts in United States Dollars and *Nuevos Soles*. The opening of those bank accounts is made with minimum amounts of US\$ 500 for each.

Initial Expenses	
Concept	Amount in US\$
Initial Capital	380
Registration Costs	3,000
Accounting Registration	500
Bank account opening	1,000
Other initial expenses	500
Total	5,380

2.2.2 Monthly Costs of initial Staff Operation

The creation of a company requires a minimum of staff to start operations for the development of the project. The recommended staff in the initial stage is: General Manager, Project Engineer, Administrator, Accountant, In-house Lawyer, Secretary and Messenger.

According to Peruvian labor law, there are several kinds of temporary employment contracts. These contracts must be used only meanwhile there are temporary causes to use them. After this time, employees must be hired under indefinite employment contracts⁷. The monthly costs estimated of the staff for the development of the project are:

Concept	Amount in US\$ (*)
General Manager	5,000
Project Engineer	2,300
Administrator	1,700
Accountant	1,500
In-house Lawyer	2,300
Secretary	800
Messenger	400

⁷ The Peruvian labor Law is very protectionist; once an employee is hired under an indefinite employment contract, the possibility of discharge is subject to specific causes.

Total	14,000
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(*) Total costs, include concepts such as taxes and related ones.

2.2.3 Administrative Costs for Project Development

Administrative costs consider the payment of an office rent, communication expenses and payment of various services which are estimated below:

Concept (Monthly)	Amount in US\$
Rent (Office of 120 m2)	2,500
Telecommunications	500
Consumables and Office supplies	400
Logistics Costs	2,000
Courier Expenses	600
Total	6,000

An implementation cost and design of office should be considered also.

Concept	Amount in US\$
Office implementation (based on seven employees)	15,000

2.2.4 Acquisition of a Project:

The purchase of a hydro power plant project can be done in different stages of development: In the pre-feasibility stage, basic pre-operating stage advanced pre-operating stage and the operation stage. For the purpose of this report, the estimated amounts are for a project of similar power as Las Orquideas.

- Pre-Feasibility Stage:** In this stage the company only acquires rights and authorizations to study in basic level. Under this scenario, the acquirer should consider forming a company as mentioned in the previous point and assume risks on the project's viability. The price of a project in this stage can vary between US\$ 80,000 and US\$ 250,000, depending on their viability, percentage of completion and details of their studies; another way to estimate the value at this stage is to consider the 0.5% of investment value. Determining conditions for the recovery of the project are its location, area of influence, access and interconnection feasibility.

- **Basic Pre-Operational Stage:** By acquiring a project in this stage means that the licenses and permits are already approved. The engineering is at a basic level so the estimate of the total investment is more precise. In this stage the project may be submitted to biddings and should have mitigated many risks for the viability. The price of a project in this stage varies from US\$ 250,000 to US\$ 2'000,000; it is also possible to take as a valuation reference a parameter between 1% and 2.5% of project value. By acquiring a project in this stage, the developer also should consider forming a company and carry out proceedings for a change of the authorizations and rights granted. Within these changes is necessary to consider the given guarantees provided for the power generation concession.
- **Advanced Pre-Operational Stage:** In this stage the project has all the detailed engineering or it is under construction; the main advantage of this type of project is the ability to seek funding if they have power purchase agreements or construction contracts. The valuation of a project in this stage should be based on a due diligence of the expenses incurred and considering the expectation of profits for the developer, an estimate to be considered is between 5% and 6% of the total investment amount. In this stage of a project, the human capital is a key factor, so it is advisable to keep the staff involved in the project either through a merger of the acquired company or the hiring of professionals in charge of the project. In this stage of the project the owner keeps standby letters of credit as a guarantee for its concretion, which shall be assumed by the new owner, so it is necessary to have funds enough to maintain this guarantee.
- **Operation Stage:** In this stage the project shall be valued in terms of cash flows that can be generated and its operating costs. In general, changes in ownership of a power plant in operation do not generate greater implications for the new owner; the proceedings and paperwork for changes in permits do not represent major financial disbursements. In the market for operating power plants have rates of return of around 10% to 12%, the rates of return for investors (with funding) in the order of 12% to 15%.

III. LEGAL, TECHNICAL, FINANCIAL AND ECONOMIC PREREQUISITES FOR OBTAINING THE CONCESSION AND OTHER PERMITS AND AGREEMENTS TO (1) DEVELOP, (2) BUILD AND (3) OPERATE AN HYDRO POWER PLANT

3.1 Required concessions, permits and agreements

For the development, building and operation of a hydro power plant the following is required:

3.1.1 Municipal Permits:

- **Fit Out License:** A permit that allows the property land to be fitted out for construction.
- **Construction License:** A permit to allow the construction prior to a technical evaluation by the Municipality.
- **Construction Conformity:** Conformity by the Municipality once the construction is completed.
- **Operating License:** An authorization by the Municipality to carry out commercial operation in a designated establishment.

The Municipalities are the zonal authorities in charge of granting specific permits, authorizations or licenses in their territorial circumscription.

3.1.2 National Permits:

By the Ministry of Energy and Mines

- **Concession for power generation:** A permit that allows the realization of the activity of power generation. The specific requisites for this permit are detailed further down.
- **Easement:** A permit that allows the holder the use of public and third party goods for public service and the right for easements to carry on activities of electrical generation or transmission.

By the Ministry of Culture

- **Certificate of non-existence of archeological artifacts (CIRA, by its Spanish acronym):** A certificate issued by the Ministry of Culture indicating there are no archeological artifacts in the project land.
- **Archeological Monitoring Plan:** A plan to be issued by the holder of the CIRA before starting with any of the excavation in the project land.

For the purpose of this report, is enough to mention that the Ministry of Culture is the public agency that regulates the matters involving the nation's cultural heritage, tangible and intangible.

By the Regional Government

- **Detailed Technical and Safety Inspection:** Certifies the holder that inspection about safety rules were successful, according to the size of the project areas that will be occupied by personnel and for offices.

The Regional Governments are the zonal authorities in charge of granting specific permits, authorizations or licenses in their territorial circumscription. It covers an area broader than Municipalities.

By National Water Authority

- **Water use authorization:** Permits the use of water for execution of works in the project area.
- **Water use license:** Permits the use of water for hydropower generation. This license will be granted automatically after verification that the works were executed accordingly to the characteristics, specifications and conditions of the approved technical file.

The National Water Authority is the public agency that is responsible for conducting the administration of water resources in Peru, in coordination with regional and local governments and all social and economic actors involved.

By COES

- **Approval of a pre-operability study:** Determines whether it is feasible to connect the new project to the national electric grid. It must be carried out according to Technical Procedures of COES.
- **Approval of an operability study:** Determine whether the new facilities will not have adverse effects on the operation in the national electric grid in terms of: (i) Overloading of lines and transformers, (ii) Levels of strain out of range, (iii) Steady-state oscillations, and (iv) Protection Coordination problems. It must be carried out according to Technical Procedures of COES.

- **Approval of commercial operation:** Permits the participation of a power generation company in the Spot Market, as is explained further down. The main requisite for the proceeding is the energy injections and retires modeling agreement in the electric busbar where the power plant will be connected, when not connected directly to the main transmission system.

By The National Service of Protected Natural Areas by the State (SERNANP, by its Spanish acronym)

- Permit to perform electric activities in a protected natural area.

SERNANP is the public agency that directs and establishes criteria for technical and administrative conservation of Natural Protected Areas. The SERNANP carries out its work in coordination with regional and local governments and property owners recognized as private conservation areas.

3.2 Description and analysis of the specific conditions for obtaining the concession of generation

This section provides information about economic, technical and legal requisites to obtain a concession for generation of electric energy. Those conditions are:

- Application form.
- Legal identification and address of the applicant, accrediting the registry in public records office and identification of legal representative.
- Affidavit of compliance of technical and environmental standards, as well as conservation standards of cultural heritage.
- A descriptive report and complete signed plans of the project, with at least feasibility studies.
- A timetable, indicating the beginning for execution of works and the commercial operation date. It is of vital importance to consider gaps in execution of works, because the supervision is made on the basis of this timetable.
- A project budget.
- Technical information for statistical purposes, consisting at least of the following: installed power plant, number of generation units, type of each

generation unit, model of each generation unit, monthly hydrological data, design data, location plans, diagrams of works, point of connection to the national grid.

- A stand by letter of credit equivalent to 1% of the budget of the project with a limit of 500 tax units⁸ (equivalent to approximately US\$ 670,000), to guarantee the correct execution of works.
- Verifiable sustentation of investor's commitment to furnish funds for execution of works.
- Favorable report issued by a Qualified Risk Rating Company with respect to the financial solvency of the investor.
- The pre-operability study approved by COES.
- A copy of the water use authorization.
- A specification of required easements.
- A demarcation of the concession area in UTM PSAD 56 coordinates.

3.2.1 Procedure

With the compliment of all of the requisites mentioned before, formally the concession should be granted in ninety calendar days. Although in fact usually takes between four to six months. The resolution that approves the concession will be published in the Peruvian Official Newspaper "*El Peruano*". After this publication, the concession contract must be signed by both parties in a term of two weeks approximately.

3.3 Legal Possibilities and Issues to buy concessions and permits from another developer ("share deal vs. asset deal")

There are several possibilities to buy or get a concession of power generation, between them, there are the concession right cession, buying stocks of the owner entitled with the concession of power generation, and the execution of a joint venture contract with the company holder of the concession right.

⁸ A Peruvian tax unit is equivalent to S/. 3,600 (approximately US\$ 1,340).

In the case of cession of the concession right, it is required a private contract. This cession must be authorized by MINEM, consequently implies a modification of the concession right, initially granted to the transferor.

When the concession title holder company has only one project, it is pretty much simple to get to the concession title by acquiring the number of stocks that allow the control of the title holder company. This acquisition is very simple and it is made by private contract that must be registered in the register of stock certificates, and does not require any procedure with MINEM.

Finally, the joint venture contract allows participating in the development of a generation project without acquiring the concession right, participating in the execution of the project as agreed between the parties (contributing money, goods or services). The joint venture does not create a new legal entity and does not require inscription in any registry.

3.3.1 Costs and financial considerations

Financial-Economic Requirements

The possibility to endorse the necessary standby letter of credit requested in the concession procedure.

The company or project shall maintain monthly financial statements and annual audits in order to facilitate monitoring and accounting performance of the project. This is also a requisite demanded by banks to provide funding.

Count on a simulation base case of energy dispatch, as well as a financial economic model according to the local market (condition required by the banks if it is a Project Finance).

During construction

Technical requirements:

It must comply with the timetable submitted to apply for the concession; the failure of the timetable is cause for enforcement of the standby letter of credit endorsed for the concession, as well as the beginning of the procedure to cancel the concession.

Authorization of execution of works awarded by the National Water Authority, with the favorable opinion of MINEM and Regional Government.

The construction stage ends with the approval of the operability study by COES, as it is explained before.

Economic and financial requirements:

The most common economic and financial requisites in the Peruvian market, during the construction of the power plant are (especially when it is Project Finance):

- The investor must have the necessary capital to make the first disbursements during construction. In recent years this has become the usual practice required by banks.
- It is necessary to count on firm guarantees or otherwise have executed long or medium term power purchase agreements for 60% of the power plant capacity⁹.
- It is mandatory to have insurance contracts during construction.
- Keep contractors warranties for execution of works.
- At request of financial institutions count on option contracts for power purchase agreements as a backup in case of failure or delay in project implementation.

During operation

Technical requirements:

- Perform the tests for effective power.
- Conformity of use of transmission system facilities.
- Report of availability for measuring and recording data systems.
- Report of availability for the communication data systems to coordinate the power plant operation with COES.

Financial-Economic Requirements

⁹ This percentage applies only for hydropower plants.

- Payments to COES, OSINERGMIN and water usage fees estimated a total percentage between 1% to 1.5% of sales¹⁰.
- Maintain insurance contracts for the operation of the power plant.
- Maintain firm power purchase agreements for 60% of effective power.
- Maintain debt coverage ratios above 1.2x, where the ratio is (EBITDA – Operation & Maintenance Costs - Income Tax - Employees Participation) / Financial Debt Service, according to Peruvian banking practice.

3.4 Legal and economical requirements for raising equity and debt and general financial issues in the context of building and operating a Hydro Power Plant

Equity capital

Hydropower plant projects of small and medium scale in Peru are an attractive option for non-specialized investors, because of their relatively short period of development and profitability, which is why many domestic and foreign companies have found this type of project as an opportunity to supplement or diversify their investments.

Currently, a significant number of companies engaged in engineering, construction and mining have started to develop hydropower plant projects, taking advantage its surplus funds and availability of resources. On the other hand, generating companies with greater presence in the market prefer to develop medium-sized projects, leaving the small-scale to risk investors.

To succeed in attracting capital for a project of this kind, is necessary that is relatively mature in their development, because the investors prefer to avoid the uncertainty and risk in the early stages of the project. Basically, what they are looking for when evaluating a project is that is: fundable, have predictable cash flows and it is developed in a stable environment (about this last topic, the social and environmental stability is one of the key factors when deciding to invest in Peru).

Medium-scale projects reach their peak performance when they are developed by the Project Finance scheme. Additionally, this scheme helps to spread the

¹⁰ In case of COES the limit is 0.75%, but it is usual that the companies pay less than that percentage. In case of OSINERGMIN, the limit is 1%, and it is usual the payment of the maximum amount permitted.

project risk with the financial entities and other stakeholders. However, the local financial market in recent years has reduced its assumption of risk, changing credit conditions and requiring technical, economic and financial guarantees before trusting on Greenfield projects.

Among the barriers that the financial market may indicate:

- Relation between debt and capital for new enterprises. Until about five years ago, a project could be financed with 10% of capital and 90% of debt; today the local market is offering a leverage of 35% to 40% for equity and 65% to 60% for debt.
- Equity first. It has been requesting the disbursement of shareholder total capital, and just after that the disbursements of credit are made; in that way, the bank reduces its risk during the first months of construction. This type of financing transfer the risk to the investor, often discouraging them to new disbursements.
- Collateral cash. To achieve the financial closure, the credit must be supported by guarantees equivalent between six to twelve months for the payment of debt service.

To obtain capital, it must have in consideration the existence of resistance by investors to hold minority stakes, since in this type of companies the good corporate governance practices are not guaranteed. Based on these considerations may be recommended to attract social capital the following sources:

- Mining companies that invest in power projects to ensure their energy supply with its own production.
- Industrial companies with contracts in excess of 2MW (steel mills, cement plants, fishing companies), that seek to minimize the risk of supply and reduce costs.
- Construction companies looking for to capitalize on the construction of the project and willing to participate in minority percentages, leaving the operation to specialist companies in the sector.
- Foreign companies and industry specialists able to give financial support to the project.

- Investment funds with capital recovery periods of long-term (like pension fund managers companies).
- Multilateral development agencies (like “*Corporación Andina de Fomento*”, Inter-American Development Bank, Environment National Fund, etc.)

3.4.1 Short-term and long-term debt, bank loans, other debt instruments

Short-Term Debt

The short-term debt in Peru is very scarce, expensive and is not adequate to finance hydropower plant projects; this type of loan is oriented to small and micro companies, where economic benefits can arrive between the first two or three years, allowing repayment. In the case of hydropower plants, the studies and development may take two to four years. The short-term rates oscillate from 15% to 25%.

On the other hand, there is not a capital risk market willing to invest in projects hydropower plants from its conception. The few venture investors prefer mineral exploration, and this is mainly due to political and social risks in Peru.

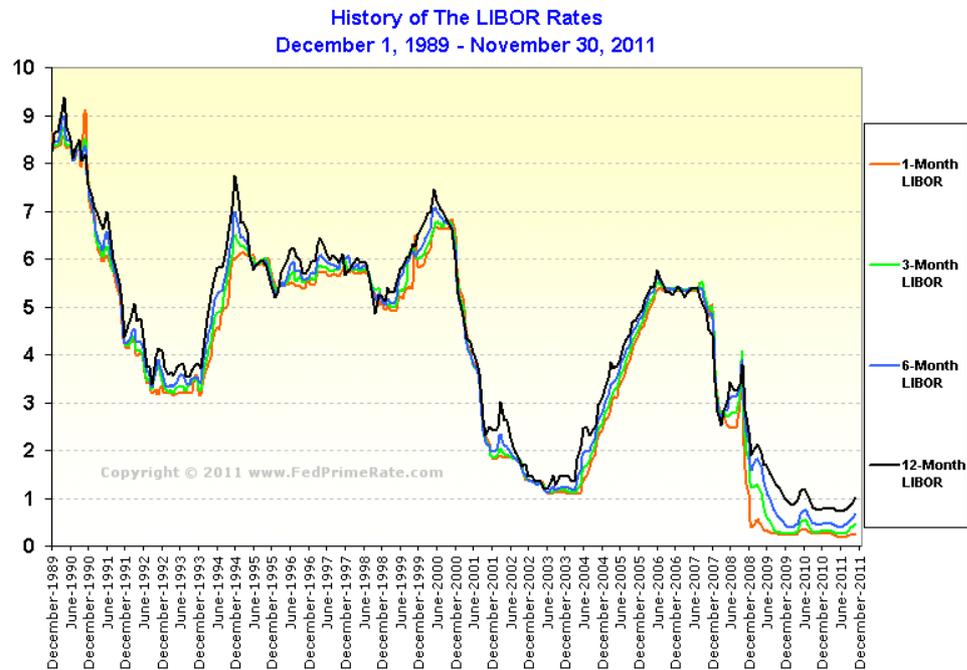
Bonds

Local bonds are one of the preferred means of financing the consolidated and in operation companies. Through this way, they finance their expansion or acquisitions of new projects with highly desirable rates (between 6% and 9% per year) for six to twelve years terms. Emissions must be guaranteed by the company assets, the holding group economic support of the company and power purchase agreements. Developing a new project using bonds allows applying for tax benefits as Income Tax Return.

Leasing

Leasing is one of the most used options by companies that do not necessarily have a sponsor or the support of an economic group. The terms vary from four to seven years. The rates offered are fixed or variable; the first is agreed by the whole period and to give greater security to the bank tends to be slightly higher than the variable rate, currently at December 2011 rates are between 7% and 10%. On the other hand, variable rates are based on LIBOR rate (to twelve months) plus a fixed rate; in the last financing contracts, the fixed component of

the rate has been between 4% and 5%, due to the large fall suffered by the LIBOR rate in recent years (see graph).



Source: www.wsjprimerate.us

In the financing via leasing, the Income Tax Return is not significant, but there is the benefit of accelerated depreciation. The most extreme case is three years (if the leasing period is the same), otherwise applies the term of five years, because this is a benefit for hydropower plant projects. On the other hand, Leasing expenses are deductible and because they form part of the assets, reduce the payment for this concept. Another advantage of leasing is that do not compromise the level of indebtedness of the company. Between the disadvantages of this financial way is the impossibility of accumulating tax credit for Valued Added Tax on the purchase of equipment, given that the bank is the owner of the plant; it is only possible to use the Valued Added Tax on the leasing fees.

Long Term Debt

The long-term loans in the local market will depend on the amount. Those in excess of US\$ 50 million are made mostly through syndicated loans between two or more banks or financial institutions. For loans of less than US\$ 50 million, it is common to constitute an asset trust and a cash flows trust in favor of the bank,

to guarantee payment of the debt. Interest rates of long-term instruments oscillate between 8% and 10%, and are for minimum periods of ten years. This type of financing for new companies, involves a greater number of risk mitigation instruments, like insurances against political risk, sue risk or maintenance of support contracts.

Long-term biddings as a means of financing

In recent years the Peruvian market has been developing power biddings to supply future demand and thus avoid possible scenarios of energy rationing as well as encourages the development of new projects. Energy biddings allow to concession holders and companies with projects under development sign future power purchase agreements with distribution companies. With this kind of agreements the future cash flows is guaranteed.

Clean Development Mechanism (MDL, by its Spanish acronym)

MDL programs is linked to emission reductions and the trade of carbon credits, these are applicable for hydropower projects as long as they are conceived and carried out under this approach since the beginning of the project and can demonstrate the reduction of emissions. Peru is a country that allows the use of this mechanism. To enjoy the benefits of the MDL program, the project must have a low profitability and become attractive only because the carbon credits. Having a MDL type project improves cash flows, allowing to have additional income from 5% to 9%.

3.5 Provisions and regulations on capital transfers, dividend transfers and international intercompany transactions including tax issues

Peruvian regulations do not discriminate between domestic and foreign companies. Foreign investors should be treated equally.

There are no restrictions for foreign investors to transfer to their countries the profits they have been obtained in Peru.

International capital transfers are unrestricted. Just need to provide the minimum information required by the rules to combat money laundering.

For its operations, companies are subject to the following taxes:

3.5.1 Income Tax

Peruvian resident companies are generally subject to Income Tax –at a corporate level– levied at a rate of 30%. In addition, dividend distributions made to individuals (either resident or non-resident in Peru) or to non-resident legal entities, are further subject to a supplementary Income Tax levied at a rate of 4.1% on the value of all such distributions.

According to Peruvian domestic law, local permanent establishments of non-resident legal entities must be recorded with the Peruvian tax authorities, being subject to local tax obligations as any other resident corporate taxpayer. The only particularity is that local permanent establishments of non-resident legal entities are subject to the aforesaid 30% Income Tax only with regard to their “Peruvian-sourced” incomes¹¹.

The above-mentioned supplementary 4.1% Income Tax also applies to local permanent establishments of non-resident entities. For such purpose, profits will be deemed as distributed on the last day foreseen to file the annual Income Tax return.

Generally speaking, payments of Peruvian source incomes by Peruvian taxpayers to non resident entities (not having local permanent establishments) are subject to Income Tax withholdings levied at a rate of 30% (a 15% rate applies in the case of technical assistance provided certain conditions are met).

In the specific case of interest, under certain circumstances, a reduced withholding rate of 4.99% may apply where interest payments are made to non-resident unrelated lenders.

Expenses incurred in the generation of revenues or in maintaining its source are generally deductible for determining the corresponding tax base for Income Tax purposes¹².

In order to have the possibility to deduct expenses for fiscal purposes or to benefit from tax credits, local taxpayers must use certain specific “payment means” when paying debts to third parties (e.g. deposits in bank accounts; bank

¹¹ The term “Peruvian source” income is defined in the law and includes, *inter alia*, income originating from real estate property located in Peru, credits, capital investments, technical assistance economically used within Peru, royalties and goods located or used economically within the Peruvian territory, and from civil, commercial, entrepreneurial or any other type of activity carried out locally.

¹² Certain limits are foreseen in our statutory provisions e.g. in the case of loans granted between related parties, interest will be deductible proportionally only for the amount of the loan not exceeding three (3) times the debtor’s owners equity (i.e. “thin capitalization”).

transfers; payment orders; debit/credit cards issued in the country; non-negotiable or similar checks; all channelled through the Peruvian banking system).

Peruvian resident companies are entitled to claim depreciation deductions in respect of capital assets used in the course of carrying on business – 20% in the case of equipment and machinery in mining, oil, gas and construction activities; 25% in the case of hardware; 5% in the case of buildings; and, 10% in the case of other fixed assets.

Machinery, equipment and buildings necessary for the installation and operation of a hydroelectric plant can be completely depreciated in five years. Independently the kind of asset, can be applied maximum rate of 20% per year (except in cases where the normal rate of depreciation is greater). Accelerated depreciation allows advance the deduction of the amount invested in assets, so that the tax payment is deferred to subsequent years, generating more initial liquidity to the taxpayer.

Exceptionally, if the assets are acquired through a leasing contract, they can be completely depreciated in the duration of the contract. To this purpose, the contract must have a minimum duration of two years in case of movable goods, and five years for buildings.

In the case of sales and other property transfers as well as in the provision of services, notwithstanding the consideration agreed upon between the parties, for tax purposes the relevant transaction shall always be deemed as made at its corresponding “fair market” value. If the value determined by the parties differs from the “fair market” value, the tax authorities will make the necessary adjustments for both the purchaser and seller.

In the case of transactions entered into between “related” parties, the corresponding “fair market” value shall be deemed equivalent to the consideration that would have been agreed with or between independent parties in comparable transactions, in identical or similar conditions (following local “transfer-pricing” rules).

Peruvian resident companies are generally entitled to carry forward at least a portion of any tax losses sustained in previous fiscal years to offset taxable income earned in subsequent fiscal years.

For such purposes, taxpayers may elect between one of two systems: (i) the first allows tax losses to be carried forward for four years from the year in which they are incurred; and, (ii) the second allows tax losses to be carried forward indefinitely but only to offset 50% of net income earned during the relevant fiscal year.

Peruvian resident companies must make Income Tax anticipated payments on a monthly basis, based on the net income obtained during the relevant month, according to the procedures set forth in the Act.

3.5.2 Net Assets Tax

This tax, so-called “ITAN”, levies the net assets value of corporate taxpayers as reflected on their corresponding Balance Sheets as of December 31st of the previous year. It must be paid only by taxpayers that are already in a productive stage as of December 31st of the corresponding previous year.

A taxpayer will be deemed as already in a “productive” stage whenever it has transferred an asset or provided a service related to its corporate purpose or business.

ITAN is determined applying the following rates:

	Net assets' value
0%	Up to S/. 1,000,000 (approx. US\$ 360,000)
0.4%	Exceeding from S/. 1,000,000

In principle, taxpayers have the possibility to consider ITAN payments: (i) as a deductible expense; or, (ii) as a credit to offset with the corresponding Income Tax monthly prepayments and with annual Income Tax. However, if at the end of a fiscal year the ITAN paid exceeds the annual Income Tax due, taxpayers have the possibility to request the refund of such excess.

3.5.3 Value Added Tax

A 18% Value Added Tax (IGV) applies to the following transactions: (i) sale of movable goods within Peru; (ii) services provided or used within Peru; (iii) construction contracts; (iv) first sale of real estate by constructors; and, (v) import of goods.

IGV paid, among others, upon acquisition of goods and services can be deducted as an input credit by taxpayers from IGV related to the sale of their finished products or services (output IGV).

Local taxpayers must declare and pay IGV on a monthly basis.

3.5.4 Financial Transactions Tax

A Financial Transactions Tax applies, among others, to any transfer, movement, debit or credit made on bank accounts held by individuals and companies in the Peruvian banking system.

The tax rate is 0.05% which, in principle, must be withheld by the corresponding local bank.

3.5.5 Real Estate Property Tax

This tax levies the value of urban and rural properties (real estate). Individuals and legal entities owning real estate are considered taxpayers for such purposes.

The taxable base is calculated taking into account the value of all the properties owned in a specific local district, as reflected in the internal records of the corresponding local authorities, whereas the tax is calculated applying the following progressive cumulative scale:

Rate	Real estate's value
0.2%	Up to 15 tax units (approx. US\$ 19,500)
0.6%	For the excess of 15 tax units and up to 60 tax units (approx. between US\$ 19,500 and US\$ 78,000)
1%	Over 60 tax units (over approx. US\$ 78,000)

Note.- A tax unit is currently equivalent to approximately US\$ 1,300.

3.5.6 Real Estate Transfer Tax

This tax, so-called "alcabala", levies all transfers of urban and rural real estate properties. The taxpayer is the corresponding purchaser or acquirer of the property.

The taxable base is equivalent to the consideration agreed upon by the parties to the transaction, provided that it is not lower than the value of the relevant property as reflected in the records of the corresponding local authorities (i.e. “autoavalúo”). The first ten tax units (approx. US\$ 13,000) of the taxable base are exempted from this tax.

The tax rate is 3% and must be borne exclusively by the relevant purchaser.

3.5.7 Vehicle Property Tax

This tax levies the property of vehicles, automobiles, cars, vans, trucks and buses, not older than three years computed since their first inscription in the Vehicles Public Register.

The tax rate is 1% which must be calculated on the vehicle’s value. In no case the payable tax will be lower than 1.5% of the tax unit in force as of January 1st of the relevant year.

3.5.8 Payroll taxes and labor contributions

The main payroll taxes and labor contributions are the following: (i) Income Tax; (ii) Pension System contribution; (iii) Health Social Security contribution; and, (iv) Complementary Insurance for Risky Work. A summary of their principal features follow:

Income Tax

- For individuals considered as resident for tax purposes, the tax amount is established applying over the net income (total salary received within the year, less seven tax units – approximately equivalent to US\$ 9,100) the following progressive scale:

Rate	Net income
15%	Up to 27 tax units (approx. US\$ 35,100)
21%	Exceeding 27 tax units up to 54 tax units (approx. US\$ 70,200)
30%	Exceeding 54 tax units

- For non-resident individuals¹³ a flat 30% rate shall be applied over the total gross income, without deducting the aforementioned seven tax units.
- This tax is funded by the employee, but the employer is responsible for withholding and remitting it to the tax authorities.

Pension System contribution

- The employee can be affiliated either to the National Pension System (NPS) or the Private Pension System (PPS). In the NPS, the contribution is equivalent to the 13% of the salary, whereas in the PPS it depends on the entity in which the individual is affiliated to (12.5% in average).
- The pension contribution is funded by the employee, but the employer is responsible for withholding and remitting it to the correspondent entity.

Health Social Security contribution

It is borne and paid exclusively by the employer, and is equivalent to 9% of the employee's salary.

Complementary Insurance for Risky Work

- This System is funded by a contribution paid by the employer. The amount of this contribution varies according to the nature and frequency of risks in each workplace based on a risk scale and legally approved percentages.
- The basic contribution rate is 0.53%. This percentage can be increased or decreased according to different criteria (number of employees, fulfilling of occupational health and safety regulations, etc.).
- Companies that perform high risk activities must hire this insurance (e.g. mining industry). All employees working in the workplace in which high risk activities are performed and employees who are usually exposed to the risk of work-related accidents and occupational diseases must be insured.

3.5.9 Customs duties

¹³ Non-resident individuals acquire the tax residence status in Peru after staying in the country for more than one hundred and eighty-three (183) calendar days during any twelve (12) month period. The change is applicable as of January 1 of the next fiscal year. When acquiring the tax residence status, the employee becomes a taxpayer of Income Tax for his/her worldwide source income.

The taxable base for assessment of import taxes is determined in accordance with the valuation rules of the World Trade Organisation (WTO).

The “transaction value”, or the price effectively paid or payable for the imported merchandise, is the most followed method to determine the customs value and used as reference to determine the CIF (“cost, insurance, freight”) value of the merchandise.

A merchandise imported into the country is subject to the following taxes: (i) *ad valorem* duties, three levels: 0%, 6% or 13%, depending on the applicable tariff sub-item; and, (ii) a 18% IGV.

In addition, certain goods are subject to the following taxes: (i) extra *ad valorem* duties applicable to certain agricultural products. The application of this tax depends on international prices; and, (ii) Selective Consumption Tax.

These duties may be reduced by special duty reduction programs and/or Free Trade Agreements and may be increased by antidumping or countervailing duties.

3.5.10 Profit sharing

Peruvian Labor Law sets forth an employee profit sharing regime for companies engaged in income-generating activities, whose employees are subject to the private companies’ labor system. Companies with twenty employees or less are excluded of said benefit, as well as cooperatives, self-management companies and civil partnerships.

Employee profit sharing is based on the annual taxable net income after offsetting any carry forward losses, in accordance with regulations governing Income Tax (it is not calculated on the employer's commercial profits but on its annual tax net income).

The percentage to be distributed varies depending on the activities carried out by the employer (a 5% applies as a general rule although specific rates are provided in certain cases e.g. 8% for mining companies, 10% for industrial companies).

Profit sharing benefits must be distributed among employees¹⁴ as follows: (i) 50% of the corresponding amount (to be distributed) shall be distributed in accordance with the number of days effectively worked by each employee; and, (ii) The remaining 50% shall be distributed proportionately to the remuneration of each employee.

The amount that may correspond per employee has a maximum limit of eighteen monthly salaries calculated on the basis of the salary in force as of the end of the fiscal year.

IV. Regulations for selling and trading electricity

4.1 Required permits and agreements

There are two ways to sell or trade electricity in Peruvian power market. These are: (i) the power purchase agreement market and (ii) the spot market. In the first case, the trading capacity of a generation company is limited by its firm power and energy (of the generation plant itself and hired with third parties).

In both cases, the generation company needs to integrate to COES, and require the commercial operation. Only after COES approves the commercial operation entry, the generation company is able to participate completely in the generation market.

If it is the case of PPA's, there are several possibilities. In this point, we will just mention the only case that requires a previous permit to execute the PPA. In the case of public biddings for energy supply for distribution companies (and large consumers), to present a valid offer, the company require a certificate of available firm power from COES. This is necessary because legally a Generation Company is only permitted to contract with its clients until its own firm power or the one that had hired with other Generation Company.

4.2 Legal and contractual issues of spot market trading and of concluding power purchase agreements (PPAs)

4.2.1 Power plants with renewable resources

¹⁴ Within a term that shall not exceed from thirty (30) calendar days following the filing of the corresponding Annual Income Tax return.

The investment in renewable energy power plants is promoted through a quota system, feed-in tariffs and preferential dispatch in the power market. The previously mentioned Decree N° 1002 determines that 5 percent of national electric energy demand will be met by non-conventional renewable energy sources, such as wind, solar, biomass, geothermal and small hydro plants (under 20 MW), between the period from 2008 to 2013.

To this purpose, the Decree N° 1002 envisage the realization of auctions every two years; in these auctions the interested companies offer the construction of a power plant that uses renewable sources and a proposal of feed-in tariff, that will be paid by end-users as an additional charge. It is important to mention that the proposal of feed-in tariffs by the interested companies must be under the limited fixed by OSINERGMIN in an unopened envelope, that only will be open in case at least one of proposal overpass the limit and there is more capacity combined of the auctioneers in relation with the requirement of OSINERGMIN. Offers higher than the limit set by OSINERGMIN are disqualified from the auction.

The quota system of five percent of national electric energy provided by renewable energy power plants has as one of the objectives the partial reduction of environmental impact produced by large hydro power plants and thermal power plants, considering the minimum environmental effect of renewable energy power plants. This positive consequence also is related with the obligation for the System Operator for the preferential dispatch of these kind of power plants.

For those that participate in the auctions, it is important to keep in mind the most important economic requisites to participate, that were set in the last auctions by MINEM, given that they could be repeated:

- A standby letter of credit, equivalent to US\$ 20,000 per MW of installed power, to ensure the credibility of the offer.
- Monomial price offered.
- Plant power.
- Plant factor.
- Annual energy offered.

- Minimum percentage of energy offered possible to compromise.
- Bar supply.
- Start date of commercial operation.
- For some cases a declaration of Non-Objection by COES (related to the connection to the national grid).

For those that are winners of the tender, it is mandatory to comply additionally with to evidence the establishment of a company, according to the General Corporation Law, stating that the object of business is power generation, the paid capital of the company is a minimum of \$ 100,000 per MW of power to be installed to generate the energy offered, and the ratification of all acts performed in the auction. Also, a new standby letter of credit is required, in this case to ensure the compliance of the commercial date operation. With the fulfillment of these requisites the contract is signed.

After this, the winners must apply for the power generation concession with MINEM.

In case the project is not concluded at the time compromised, the standby letter of credit will be executed and the contract resolved.

4.2.2 Long and short term power purchase agreements with Distribution Companies

Before the promulgation of Law N° 28832 the Distribution companies used to execute power purchase agreements directly with generation companies. The power and energy prices were determined annually by OSINERGMIN and conducted through a public procedure. Under any circumstance those prices could be different of the approved by OSINERGMIN. Besides, those agreements had a typical structure about technical and commercial matters, which implied that practically the negotiation were focused on the power to compromise and the time extensions. In these cases the top power and energy prices are the approved by OSINERGMIN.

To be more precise, previously the Law N° 28832, due to some problems in the generation market exacerbated by a prolonged drought, it began a crisis of this market, the generation companies did not renew their expired contracts with

distribution companies, and these companies could not find new suppliers. The reason for this situation was the fact that meanwhile prices of the contracts with distribution companies were stable and determined by OSINERGMIN, the price of the energy in the spot market was very fluctuant and most of the time higher than the first one; therefore, most generation companies preferred to avoid this condition.

In response to this situation, the Law N° 28832 introduced the bidding mechanism for distribution companies. Through this system, distribution companies, according to their needs of power and energy supply, request to OSINERGMIN the beginning of a public bidding. The price of the power and energy resultant of this biddings are determined by the economical offers presented by generation companies, as long as they are under a price limit set by OSINERGMIN, which is only revealed in case there are more biddings than the expected and some of these offers exceeds the price limit.

Some of the specific requirements to participate in these biddings are: a certificate of firm power available approved by COES; and in case of new projects, a standby letter of credit to guarantee the faithful execution of works.

The projects of hydropower plants have an additional advantage, because their economic offers, only for purposes of determining the order of the proposals submitted by the amount, have a discount factor in the price when competing with other generation sources.

The biddings are conducted with a minimum of three years of anticipation and consider supply terms from eight to fifteen years.

4.2.3 PROINVERSION bid for hydropower plants

So far, in one occasion the government decided to promote directly investment in hydropower plants. With this purpose entrusted to the Private Investment Promotion Agency (PROINVERSION, by its Spanish acronym), the conduction of a bidding for a total of 500 MW.

This bid had the characteristics that the price ceiling for the financial offer PROINVERSION determined, that the winners held an additional guarantees and security agreement with the State, who promised to intercede for the dealer should have social problems in the area of influence the project, or when you

have unreasonable delays by state entities in the issuance of permits required for project implementation.

It is not expected to be a new bidding of this type.

4.2.4 Power purchase agreements with Distribution Companies

It is also possible to execute contracts directly with distribution companies, off the bidding processes. This possibility occurs when there is not enough term to carry out bidding. From the point of view of the generation companies, this possibility is attractive when short-run marginal costs are below the busbar tariffs set by OSINERGMIN and it is expected that this situation continue in the future.

In the scenario described above, distribution companies often propose to generation companies the price of busbar tariffs set by OSINERGMIN with a discount to be negotiated. And with relation to the technical and commercial conditions, the parties usually consider the approved by OSINERGMIN in the model contract of the public biddings, since for both of them is a known structure and has worked flawlessly.

4.2.5 Power purchase agreements with Large Consumers

The market for Large Consumers is wide and represents approximately just under 40% of total demand. These include companies established as well as with ongoing projects (especially mining companies). That is, the range of possibilities to deal with this type of consumer is very broad.

Unlike the market of supply contracts with distributors, this is a market with no established normative parameters, so in theory everything in this contract is negotiable. However, technical and operational issues are standard in the market, leaving more space to negotiate other issues, including of course the price of power and energy.

With regard to this market, it is important to know that a generator must take care of some contingencies that could affect the contract continue doing well. As mentioned example, is the case in situations of congestion caused by the limit of transmission system. As a consequence of this fact, could form an electrical subsystems, and if a client of the generation company is located in that

subsystem, the generator will have to buy energy in that subsystem, which could have an important economic impact, that must be transferred to the client.

4.2.6 Spot market

The Peruvian market type is a pool system with centralized economic dispatch based in audited generation costs. In this market currently only participate Generation companies. This market is independent from the power purchase agreements executed by generation companies. The dispatch of the power plants is determined by COES, according to a ranking of efficiency between all available power plants. Every end of the month, COES determines the injections of energy to the system of every generation company and also the energy taken from the system by their clients, and according to the results, determine the payments to be made between them.

As we mentioned previously with Law N° 28832, was reformed the conformation and operation of COES, giving the right for distribution companies and Large Consumers to be part of this entity. But to date, they cannot participate directly in the Spot Market, because the modification of the Technical Procedures of COES for this purpose is still in development.

4.2.7 Short Run Marginal Cost

Is the incurred cost to produce an additional unit of energy, or alternatively the obtained saving up to leave the production a unit, considering the demand and the available generation park.

To determine the short run marginal cost every 15 minutes, is used the energy information received from the generation companies that integrate COES, which correspond to the dispatch of power and energy for the month of transfers of power and energy valorization.

The dispatch is determined by COES, assigning in optimal way the available generation resources to satisfy the demand, granting the operation at minimal total cost and preserving the safety and quality of the energy supply.

With the data of the power plants that have intervened in the dispatch, and according to the programmed and authorized by COES, those plants are ordered in periods of every 15 minutes from lowest to highest cost, in the basis to their variable costs of operation. These variable costs previously have been referred to

the base busbar of Santa Rosa, considering additionally a factor of marginal losses in the transmission system.

The marginal unit for every period of 15 minutes is the one which variable cost is the highest in that period, and which is able to produce an additional unit of energy. Specifically, the short run marginal cost is equal to the variable cost of the unit that is marginal in the system.

Exceptions to short run marginal cost

Idealized marginal cost

As we said before, currently the short run marginal costs are determined in an idealized way, considering no restrictions of production or transportation of natural gas, nor restrictions of electricity transmission. Such short run marginal cost cannot be highest to the one approved by MINEM; thereby, the real variable costs of operation which exceed that marginal cost will be covered with an additional charge to the regulated tariff through the toll of connection to the Main Transmission System.

Voltage regulation

To the COES members that incur in overruns for regulating voltage in Main and Secondary Transmission System busbars will be compensated, in a sum that is equal to the increases valued by unitary cost resultant of the difference between the variable cost of its unity (or their units) and the short run marginal cost.

Compensation for operation at minimum load

This operation mode is adopted in the programming or during the execution in real time, when by economy of the system results more beneficial maintain at minimum load, by a determined period instead of stopping it and re starting.

The compensation for this concept is assumed by all generation companies integrated to COES, in proportion to the total energy that their clients have retired from the system in the last month.

New Spot Market Regulation

It is important to mention that in June of 2011 was published the new Spot Market Regulation¹⁵, which will be in force from January of 2014. It establishes some changes in the way the short run marginal cost will be calculated and determined. This will be made in two moments:

- The previous day to real dispatch, considering the economic dispatch corresponding to the COES' operation daily program for the next day.
- The day of dispatch, considering the economic dispatch effectively executed.

The first one will be only informative (to make decision in the Spot Market the following day), because the official short run marginal cost will be of the real dispatch.

The short run marginal cost will be determined individualizing the following components:

- Short run marginal cost of energy.
- Short run marginal cost of losses.
- Short run marginal cost of congestion situations.
- Short run marginal cost associated to operating inflexibilities.
- The ancillary services will not be considered as part of short run marginal costs.

To date, the necessary modifications to Technical Procedures of COES are in elaboration. It is expected that in 2012 this is finalized.

4.2.8 Ancillary services

Operating Reserve

The currently technique normative establishes compensations for the Frequency Primary Regulation (FPR), omitting any regulation on compensations for Frequency Secondary Regulation.

¹⁵ Supreme Decree N° 027-2011-EM.

Thereby, considering that is responsibility of COES members to supply a product that respect the Technical Quality Standards for Electrical Services with the selected units for this objective; the other COES members that do not regulate frequency will compensate to the generation units that provide the operating reserve.

The unitary cost of energy for the frequency regulation will be the difference between the marginal cost of energy for that period, without considering the reserve for FPR, and the variable cost of the unit with the least value assigned in the merit order for operating reserve. The FPR payment of each generation company will be in proportion to the energy generated.

In the cases that are necessary the operation of an additional unit to maintain the operating reserve of FPR, this unit will not set a new marginal cost of the system, but must be compensated for the difference between its variable cost and the marginal cost of the system applying a factor of marginal losses in the power supply busbar, as well as the start and stop additional costs, if they are applicable.

It is necessary to specify that the regime before explained has been modified. However, this modification will not take effect until the approval of Technical Procedures of COES related to this matter. This new regime establishes mandatorily that all generation units with installed power higher than 10 MW supply free FPR, with the exception of renewable generation plants, such as wind, solar and tidal. Also, this new regime establishes that the FSR will be voluntary and subject to compensation.

4.3 Public control and regulations of electricity and power prices

As we said before, the energy price in generation market are determined by public biddings or private contracts with Large Consumers; with the only exception of power purchase agreements executed directly with Distribution companies off public biddings, in which case the busbar tariff is determined by OSINERGMIN. The power price follows the same rule. Plus, some specific concepts, determined by Law, are normally approved by OSINERGMIN, jointly with the mentioned busbar tariffs.

It is important to mention that the busbar tariffs set by OSINERGMIN may not differ in more than 10%, from the weighed average of the prices of the biddings, in force as of March 31 of each year.

In the first place, we will explain how is determined conceptually the energy and power prices. As for energy, prices at peak and off-peak are calculated as the average variable costs of generation. This involves projecting the growth in demand, hydrological conditions and the cost of fuel. Prices are different for each system busbar by the effect of transmission losses. As for power, prices are calculated based on the new replacement value and costs of operation and maintenance of the unit standard theoretical at peak and their connection to the grid. It is considered a useful life of 20 to 30 years for the infrastructure of generation and transmission; also, power prices are different for each system busbar as a consequence of transmission losses.

Now, we will describe the procedure for the determination of those prices. They are proposed by sub-committee of Generation companies of COES, and studied and established annually by OSINERGMIN for the period from May to April of the next year.

It must be made a projection of demand and generation and transmission projects that would come into operation for the next 24 months. Considering this information, determine an operating program that minimizes the sum of operating cost and the cost of rationing for the same period. Apart from the above projection on the following 24 months, OSINERGMIN considers the historical information on supply and demand in the last 12 months.

After that, it is calculated the short run marginal costs expected for the 24 months horizon, according to the time blocks determined by OSINERGMIN. Then, it is determined the basic price of energy for the study period, as an average between the estimated marginal costs and demand.

It is also settled the most economical power plant to supply additional power during the annual peak hours of demand and calculate the annual investment with the discount rate of 12%. According to the methodology, the type of the more economical generating unit for this purpose is a gas turbine operated with oil diesel.

The next step is to determine the basic price of peak power and the price of peak power busbars, for each of the busbars in the system. For this purpose, it is multiplied the basic price of peak power by the respective power loss factor, adding to this product the toll of connection.

After it is determined the price of energy for each busbar of the system, multiplying the basic price of energy of each hourly block for the energy loss factor.

Finally, it is calculated for each busbar of the system the power loss factor and a factor of energy lost in transmission.

On the other hand, as mentioned before, some additional charges are determined by OSINERGMIN, because special policies dispose that these will be added to Main Transmission System Pike, so the final users pay for them. These are:

- **Charge for Safety Supply Compensation:** that compensates to the dual generation plants that operate with natural gas or diesel.
- **Charge for Generation with Renewable Sources Bonus:** that compensates the operation of generation plants that uses renewable resources.
- **Charge for Additional Generation Compensation:** that involves payment for installation of emergency generation plants.
- **Charge for Compensation of Additional Variable Cost:** that involves payment for surcharge of units that operate with variable marginal cost higher to the limited fixed by MINEM.
- **Charge for compensation of withdrawal without contract:** that involves the payment for surcharge of generation plants that supply energy intakes without contractual support.