

## Country Assessment Report

### Country/Region Name- Peru:

Peru is situated in western South America; bordered by Ecuador, Colombia, Brazil, Bolivia and Chile. It has a population over 31 million and GDP worth \$222 billion, with a growth rate of 3.9%.

(World Bank 2018)

### Economic structure and activity:

Peru has a mixed economic system, combining market freedom with centralised economic planning and state regulation.. It is one of the fastest growing economies in Latin America, catalysed by a suite of prudent macroeconomic policies and structural reforms.

The service sector accounts for 53.66% of the nation's GDP, comprising of tourism, finance, construction and telecommunications. Industry contributes 31.475 to Peru's GDP, dominated by a large and dynamic mining industry, particularly in copper, silver, gold, zinc and lead. The nation is also well endowed with oil and gas reserves. Peru's manufacturing services concentrate in textiles, consumer goods, food processing and fish products. Agriculture contributes a considerable 6.89% of GDP when compared to the small availability of arable land (1.7% of territory). Its main agricultural products include cotton, sugar, coffee, wheat, rice, maize, quinoa, barley, avocado, mangoes, artichokes and grapes.

(Statista 2018; Santander 2020; World Bank 2020)

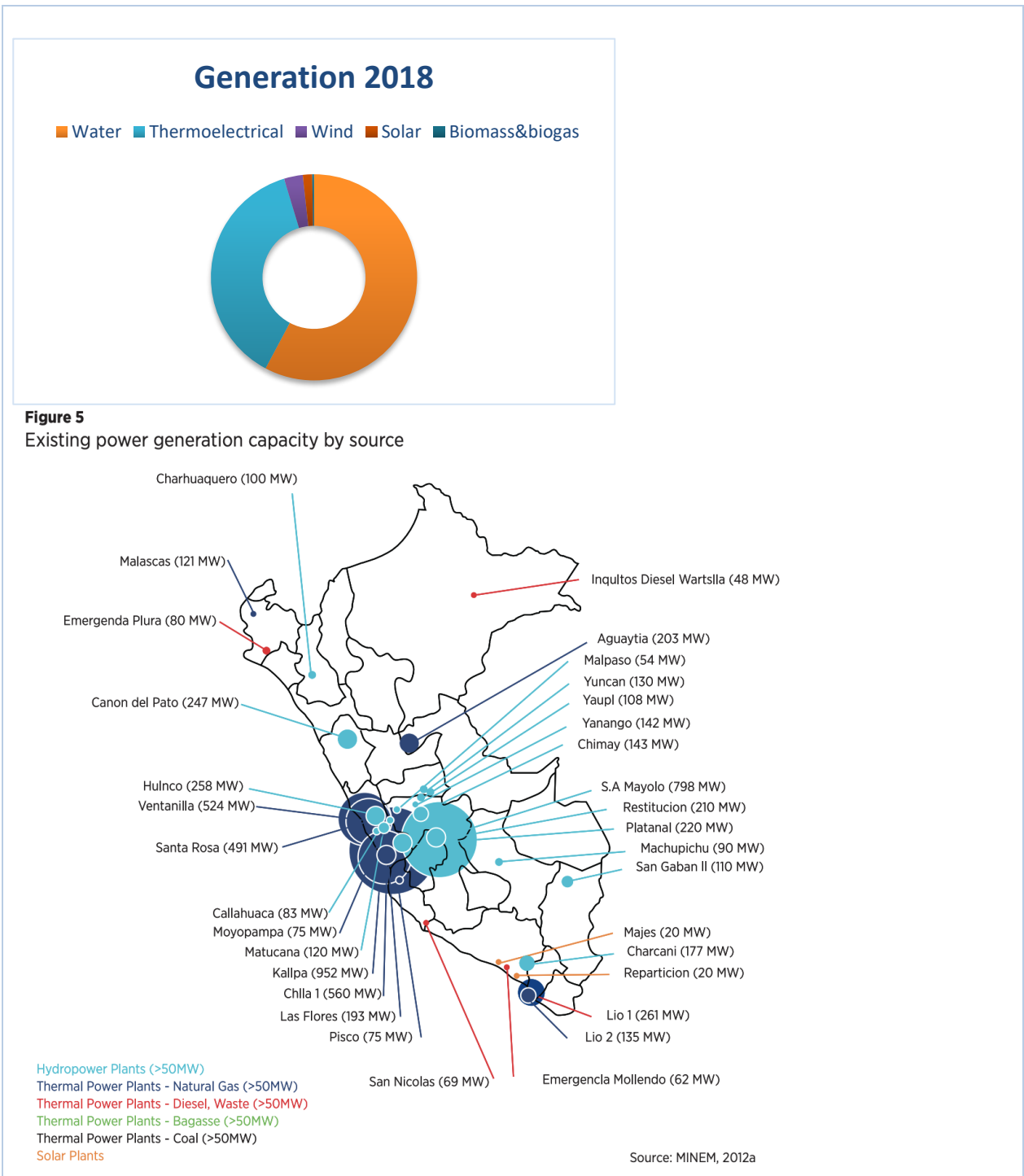
### Top private companies with RE commitments:

### Generation and demand: (e.g. type, MW, TWh)

The 2018 generation was 50.816,79 GWh, higher 3.72% than 2017. The results for 2018 indicate the preponderance of hydroelectric generation with a 57.8%, followed by thermoelectric generation with a 37.53%, wind generation with 2.94%, solar 1.47%, and biomass & biogas 0.28%. The installed capacity was 13.051,6MW in 2018 comprised by hydroelectric 4.995,1 MW, Thermo 7.396 MW, wind 375,5MW and Solar 285 MW. This was 4,5% higher than 2017. The maximum demand was 6.885MW in December 2018. 1

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<sup>1</sup> Estadísticas Anuales 2018, cuadro N°2 Producción de Energía Eléctrica y Demanda de Potencia, ver en <http://www.coes.org.pe/Portal/Publicaciones/Estadisticas/>



**Figure 2.** Map of installed power generators as of 2012 (IRENA 2014).

**Electrical Interconnection and import/export:**

Peru has two systems, the National Interconnected Electric System (SEIN) and the isolated systems. The SEIN supplies approx. 94% of the national generation and the isolated systems the balance 6%.

There are electricity exchanges with Ecuador linked to PPAs between agents authorized by the respective governments. The interconnection is through the transmission line L-2280 in 220 kV between the substations Zorritos (Peru) and Machala (Ecuador). During 2018, Peru imported 21.2 GWh from Ecuador.

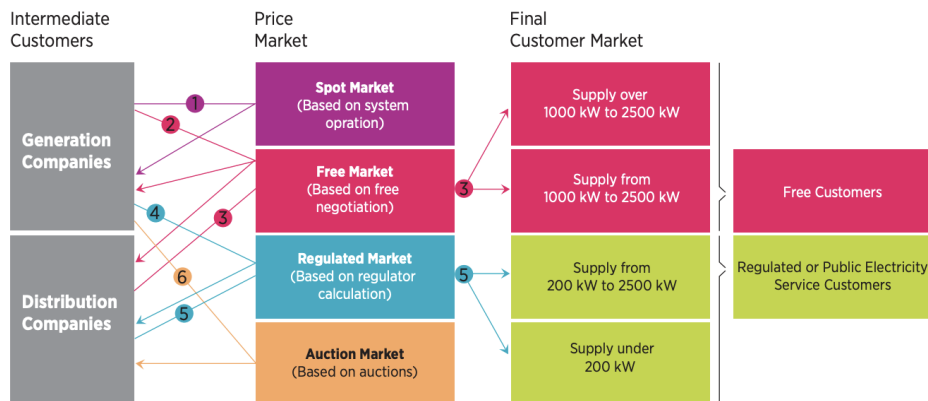
In addition, Chile and Peru have begun to evaluate the technical and economic feasibility to interconnect both countries.

**Market Structure:**

The power sector comprises of four units: the spot market, free market, regulated market and auction market, all of which interact, as shown in figure 3. Generation companies have the option to sell electricity either to other generation companies or to distribution companies.

Power transactions occur first in the spot market, where rates are defined equal to marginal cost values, varying every 15 minutes in accordance with the dispatch of the national system. Power can then be sold into the free, regulated or auction market depending on a range factors including contracts and demand. The sector’s structure has been molded by a mix of both state investment and private investment. During the early 1990s, the government introduced a suite of legislation enabling private sector participation. This helped promote a pricing system for greater economic efficiency through establishing a tariff for end-users.

**Figure 10**  
Electricity market in Peru



Source: MINEM, 2012a

**Figure 3.** Market structure of Brazil’s power sector (IRENA 2014).

**Responsible Government Department:** (include key contacts)

*Ministry of Energy and Mining (MINEM)* represents the main government entity for the sector and is responsible for developing regulations and standards vis a vis energy. The important constituent divisions within the MINEM are as follows:

*Directorate-General for Electricity (DGE)* maintains the authority to grant activities in the power sector such as the promotion of power projects, governance government policy and proposals electricity standards.

Directorate-General for Rural Electrification (DGER) is mandated to plan and promote rural electrification activities alongside regional and local governments, as well as specialised private and public entities.

Directorate-General for Energy-Related Environmental Affairs (DGAAE) is responsible for evaluating and approving environmental studies conduct for power projects.

Supervisory Agency for Energy and Mining Investment (OSINERGMIN) is the regulatory branch of MINEM, overseeing activity in the energy, including the renewable energy markets.

The Committee for the Economic Operation of the Electric System (COES) organises the operation of the national grid at the minimum cost in the short, medium and long term. COES also plans the development of SEIN (National Interconnected System) transmission lines and manages the short-term market.

(IRENA 2014)

**Existing/Planned Energy Legislation:** (is there a CPO)

The general legal framework applicable to the Peruvian electricity industry is the Electricity Concessions Law (Decree Law No. 25844 of 1992) and its regulations.

Generation companies that own or operate a generating plant with an installed capacity bigger than 500 KW require a concession granted by the MINEM.

Generating companies are remunerated for energy and capacity services. Energy refers to actual consumption and is paid at marginal cost per node or at the sale price agreed in the power purchase agreements (PPA). Power payments reward generators for having available capacity and is given by the amount that remunerates the development of a gas turbine, as the marginal unit to supply the demand of the system. The payment for capacity is independent of its dispatch and remunerates the availability if the central is within the efficient target margin indicated by the authorities. The capacity is determined by the COES-SINAC for each power plant.

Generators can sell their energy directly to distributors, free customers and settle their balance in the spot market at marginal cost. Sales to unregulated customers are made at mutually agreed prices and conditions, which include tolls and compensation for the use of the transmission system, and incorporate, where appropriate, charges for the use of the distribution networks.

The Electricity Concessions Law allows the signing of bilateral contracts at a price not higher than the Node Rate in the case of regulated customers, or at a price agreed by the parties in the case of unregulated customers. In addition to this bilateral method, Law 28,832 of 2006 called the Law to Ensure the Efficient Development of Electricity Generation, also established the possibility that distributors can satisfy the demand of their regulated and non-regulated customers under contracts signed after a process of

Power and energy tender supervised by Osinergmin. This allows generators to have a stable price for the life of the contract, which is not set by the regulator and can last up to 20 years. The vast majority of distributors have contracts to sell energy derived from these bids.

On the other hand, by the Supreme Decree No. 026-2016-EM the Regulation of the Wholesale Electricity Market (MME Regulation) was approved. The main aspects are, the "MME" is comprised by the short-term market ("MCP") and the mechanisms for assigning complementary services, operational inflexibilities and allocation of congestion charges. The participants authorized to buy in the MCP are: the generators to meet their supply contracts, the distributors to serve their free users up to 10% of the maximum demand; and the large users to attend up to 10% of their maximum demand. The COES will calculate the marginal energy costs and marginal costs of congestion. The participants must have guarantees of payment for their obligations in the MME. In addition, the regulation gives the COES the possibility to take actions on the participants in the event of the non-compliance with payment obligations.

The electricity tariff for regulated customers includes charges for energy and power for generation and transmission, and the Value-Added Distribution (VAD) that considers a regulated return for the investments, fixed charges for operation and maintenance, and a standard percentage for energy losses in distribution.

### **Environmental Legislation for RE:**

Under the application of the Legislative Decree 1002 and its regulations (Supreme Decree 050-2008-EM), a promotional regime for non-conventional renewable energy sources "ERNC" is created through auctions for specific technologies with a guaranteed income mechanism paid by the demand in the connection toll. The Decree establishes that up to 5% of the electricity demand of the SEIN can be supplied by ERNC generation awarded within this promotional regime. This objective percentage could be reviewed by the authorities based on the National Renewable Energy Plan. The technologies considered as renewable resources are: biomass, wind, tidal, geothermal, solar and mini-hydro (hydroelectric power smaller than 20 MW and that are not considered in 5%).

In 2017 the percentage of NCRE was 2.8% of the demand of the SEIN, as a result of the fourth tender awarded in 2016 the percentage increased to 4.7% for 2018.

**Existing/Planned Certificate Systems:** (purpose, extent)

I-REC are active.

**RE market potential:**

Peru is situated on the Pacific Ring of Fire, providing access to an abundance of geothermal potential. Six large and economically feasible sites have been identified, with an overall potential earmarked at 3,000 MW. The nation's power generation has already benefitted from Peru's abundant water resources, but further potential remains with a technical potential of 70,000 MW. Significant wind resources are located along the central, northern and southern coastlines. Its technical potential is estimated at around 77,000, but 22,000 MW is believed to be exploitable. Exposure to solar energy is also significant in Peru, with exploitable potential concentrated in the south and west, along the coast and the highlands.

(IRENA 2014)

**Market risks and challenges:**

Peru's power sector has faced significant electricity surplus' in recent years, afflicting low prices on the nation's fleet of generators. Increasing Peru's electrical interconnection with neighbouring countries would help alleviate this issue.

The Peruvian government has traditionally favoured exploiting the nation's abundant natural gas reserves, with hydro generators receiving less favourable tax incentives.

(Institute of Americas)

**Extent of Engagement with Government:** (brief summary of any contact already made with the national government regarding certification in general and I-REC)

The idea of implementing the I-REC Standard system in Peru was welcomed by the General Directorate of Energy Efficiency of the Ministry of Mining and Energy, [REDACTED]. He supports the idea that I-REC starts its operations on a voluntary basis since it will position the country on the same level than others such as: Chile and Colombia. The meeting was held on the 5th of February 2019 and I-REC representative attended together with representatives of Enel Trading and Enel Peru. The benefits of implementing the I-REC system are:

- Strengthens existing legislation regarding the promotion of renewable energies
- Provides the possibility of voluntarily increasing the 5% obligation allowing them to reach up to 100%.
- Provides the option for users to choose the type of electricity that they want to be supplied with. No new regulation is required.
- An IREC certificate allows electricity users to consider zero emissions for each MWh consumed in their carbon reports for indirect emissions.

Subsequently, the I-REC Standard received a formal invitation from [REDACTED] to participate as a speaker on the Official Day of Energy Efficiency held on March 5 and organized by the Ministry of Mining and Energy. Similarly, [REDACTED] himself has

expressed interest in organizing a new seminar to promote the use of RECs certificates in the Peruvian market once the I-REC Standard will be fully operative in the country.

**Expected response from Government:**

**Current Environmental Reporting in Energy:**

The following are the reports related to the Electricity Market:

[Bi-annual Report about the Electricity Market](#) issued by Osinergmin

[Annual Electricity Report](#) issued by the COES

[Monthly Electric Report](#) issued by the National Society of Mining, Oil and Electricity

**Any other Relevant Information:**

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