THE INTERNATIONAL REC STANDARD

Country Assessment Report

Country/Region Name- Republic of El Salvador:

El Salvador is situated in Central America; bordered by Honduras and Guatemala. It has a population over 6.4 million and a GDP of $ 26 billion. El Salvador suffers from persistent low levels of growth, with a current growth rate of 2.3% (World Bank 2018).

Economic Structure and Drivers:

El Salvador has a free market economy with some centralized planning and state regulation. The service sector dominates the nation's economy, contributing to 65% of El Salvador's overall GDP. Industry accounts for 17%, with manufacturers specializing in food and beverage processing, chemicals, fertilizer and textiles. The agricultural sector represents 5% of overall GDP, with its main exports coffee and sugar.

El Salvador currently hosts 15 free trade zones, which significantly benefit the maquiladora industry; which allow factories to operate duty and tariff free. The sector specialises in cutting and assembling clothes and contributes 87,000 jobs to the economy (IBP 2015).

El Salvador shares strong diplomatic and economic relations with the US, who have a strong market presence of over 345 companies. Subsidiaries of large American MNC's include Citibank, General Electric, General Motors, Microsoft and Walmart. El Salvador's dollarized economy facilitates trade between the US (their largest trading partner) as foreign exchange risk is eliminated and transactions/financial costs are significantly lowered. Remittances, most of which come from the US, accounted for 20% of El Salvador's GDP in 2017. The nation's economy is heavily reliant on the performance and FDI of the US; a dependency beginning to suffer from the economic and financial backlash of the COVID 19 pandemic.

(https://www.export.gov/article?series=a0pt0000000PAthAAG&type=Country_Commercial__kav)

Top Private Companies[1] with RE commitments:
The big end users of electricity are the Administración Nacional de Acueductos y Alcantarillados (ANDA), Inversiones Intercontinentales, S.A. de C.V. (INVINTER) y Consorcio Internacional Hanesbrands (HANESBRANDS). HANESBRANDS Global has the goal of reaching at least 40% of its total energy consumption from renewables by 2020.

Generation and demand: (type, MW,GWh)
During 2018, electricity production was 6,561.39 GWh, a decrease of 0.37% compared with the previous year. During the years 2017 and 2018 the demand for power was reduced, this effect could be attributed to the high increase in Renewable Distributed Generation in which photovoltaic self-producers are included; however, it is projected that for the next decade, the demand will grow at an annual average of 1.8%. The demand by technology is shown in Fig. 1. The system's installed capacity was 2022.1 MW.

[1] Boletín de Estadísticas Eléctricas Nº20 Año 2018, SIGET.

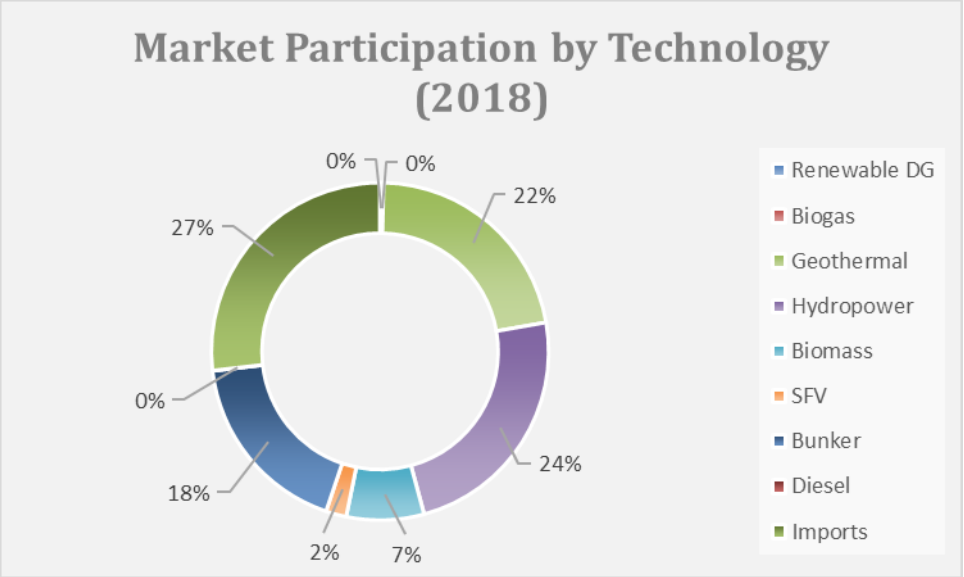


Figure 1. Market Participation by technology

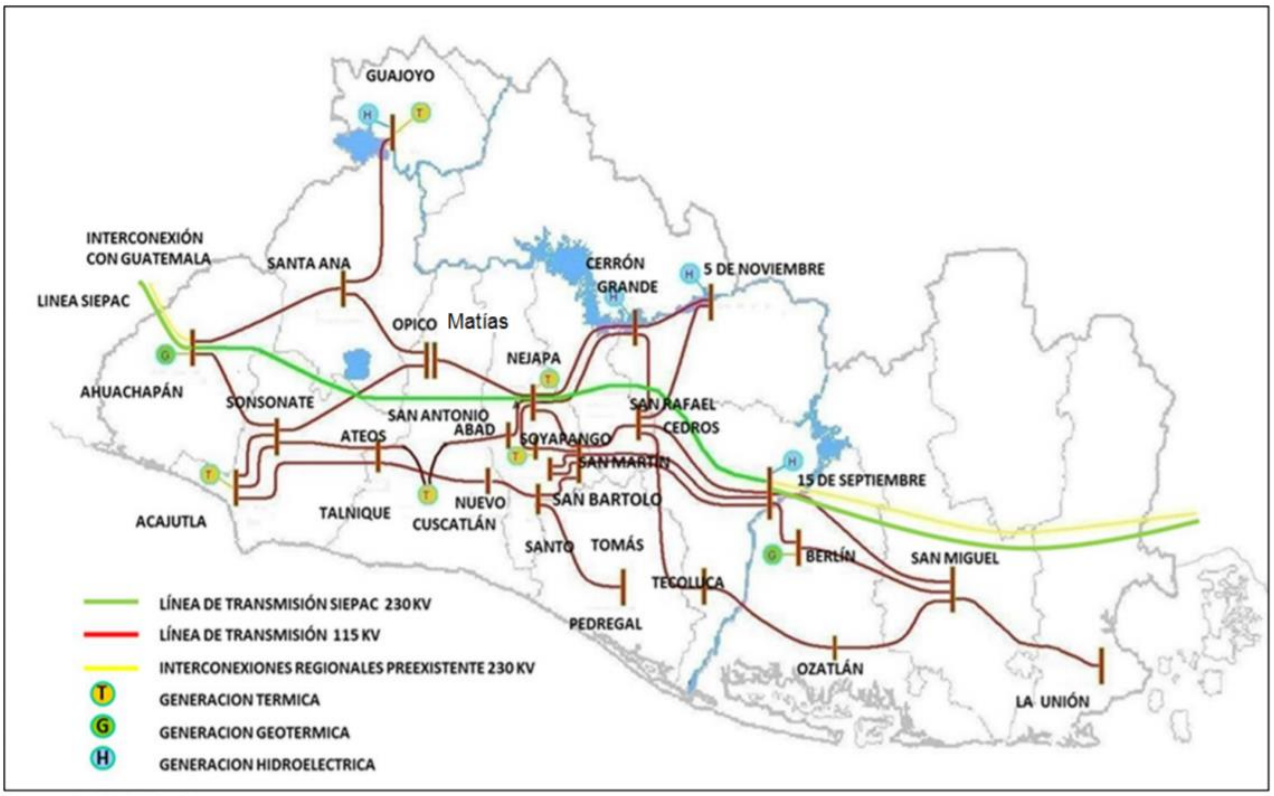
The energy supply for 2018 had some variations with respect to previous years, first, there was a decrease in hydroelectric generation due to the droughts that occurred between the months of July and August 2018, this influenced a greater transaction of energy in the regional electricity market through greater energy imports, as well as the increase in the installed capacity by generation through biomass.

55% of the total generation comes from renewable resources. During 2018, the main energy resource used for generation was Hydropower (27%). A 380MW natural gas plant is expected to begin operations by the year 2021, supplying around 36.4% of the country demand. Due to its size, this plant is expected to have a great share of the total generation during the following years, displacing other thermoelectric plants. The country's first wind power plant is expected to start operations at the end of the year 2020, adding 50 MW to the generation park. In 2017, the Providencia Solar project commissioned by Neoen became operational (López 2017), followed by the completion of the 140 MW Capella Solar Project in April 2020 (Renewables Now). In 2019, AES and CMI implemented ten 10 MW solar units named Bosforo (Renewables Now). These latest instalments have not yet been officially reported but will be included in the forthcoming electricity market data for the 2019 period.

In terms of installed capacity, of the total 2022.1 MW: (i) 552.0 MW are hydropower plants, (ii) 756.60 MW thermoelectric, (iii) 204.40 geothermal, (iv) 298.35 biomass, and (v) 60.0 MW solar. Peak demand, registered during July was 1,062 MW.

Electrical Interconnection and import/export:

The Central American countries (Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Panama) participate in a regional market called *Mercado Eléctrico Regional* (MER). Governed by a supra-national commission (CRIE) and administered by an independent operator (EOR), the MER is used by these countries for import/export energy transactions. El Salvador is a net importer in the regional market, having purchased 1759.26 GWh during 2018, positioning the country as the region's largest importer.



Fuente: SIGET, ETESAL

Figura 2. Sistema de Transmisión Nacional

Agents use the MER for short-term energy transactions, one year being the longest contract horizon. During the dry season, and motivated by price signals, Salvadoran agents import energy from this market.

Market Structure:

The Salvadoran market is comprised of different market participants that can be classified as follows: 1. Generators: companies that produce energy exclusively to be sold to the Wholesale Electricity Market and companies that produce energy for their own consumption and may sell excess energy to other market agents. 2. Transmission: there is one mixed private-public owned transmission agent, *Empresa Transmisora de El Salvador, S.A. DE C.V* (ETESAL), responsible for the operation, maintenance and planning of the national transmission system. 3. Distribution Companies: The distribution sector in El Salvador is primarily operated by two major privately owned companies, also, current legislation does not discriminate the roles of energy distribution and trading, therefore all the distribution companies also act as retail energy providers to the end user. 4. Traders: Privately owned trading companies are the primary energy importers and they operate mainly in the wholesale market, with a few of them providing trading service to large C&I customers, which may also buy electricity directly from generators acting as market participants.

The *Unidad de Transacciones* (UT), a privately-owned entity, is responsible for the economical and reliable operation of the national power system and the coordination of all transactions within the Wholesale Electricity Market. Its executive committee is formed by all players of the electricity market as following: a) Two representatives for each series of market participants, with the exception of transmitters which have only one representative; b) A representative of the National Energy Council, who has the right to speak and vote; c) A representative of the Consumer's Ombudsman, who has the right to speak and vote. A representative of General Superintendence of Electricity and Telecommunications (SIGET), who has the right to speak but not to vote. This executive committee oversees market

operation from an economic and technical perspective and elaborates regulatory proposals for the creation, modification, and revocation of market norms as well.

Utility Power Purchase Agreements (PPAs) are assigned through public bids held by the distribution companies and overseen by SIGET and PPAs with Large C&I Customers (higher than 1 MW) are negotiated bilaterally between generators and customers. The generator is responsible to deliver (through its own generation or purchases in the spot market) all of the customer's demand. Since the economic dispatch is independent of the PPA market, the balancing mechanism —i.e., the spot market— exist to deal with the differences between dispatch and PPAs. The hourly price of the spot market is calculated using the resulting marginal cost from the economic dispatch. Thermoelectric plants declare their variable cost (which is audited by SIGET), hydroelectric reservoirs have a variable cost that is calculated with stochastic optimization and renewable energy sources such as run-of-river hydros, solar and imports are dispatch at 0 $/MWh of variable cost. Ancillary services are compensated according to regulations.

Responsible Government Department:

The *National Energy Council* (CNE), an entity of Ministry of Economy, is responsible for preparing short, medium and long-term energy planning, as well as the country's corresponding Energy Policy; promoting the existence of regulatory frameworks that encourage investment and competitive development in the energy sector; promoting rational energy use and all those actions necessary for the development and expansion of renewable energy resources.

The *Superintendencia General de Electricidad y Telecomunicaciones* (SIGET), regulates all activities related to electricity and telecommunication services. SIGET grants concessions for the distribution, transmission and generation of electricity. SIGET also licenses all generation projects. It also enforces regulatory requirements through imposition of civil penalties and other means.

Existing/Planned Energy Legislation:

The General Law of Electricity (Legislative Decree No. 843) and its secondary legislation were enacted in 1996 and 1997 respectively through initiatives of the Directorate of Electrical Energy (DEE) within the Ministry of Economy (MINEC). The General Superintendence of Electricity and Telecommunications (SIGET) was created as part of the reform and was assigned responsibility for implementing the laws in the sector and monitoring compliance. The Law stablished the legal framework concerning the activities related to the generation, transmission, distribution and commercialization of electricity and provides a high degree of freedom to market agents. Article 8 explicitly authorizes vertical integration in generation, transmission, distribution and supply. The only limitation is to prohibit generation, distribution and supply companies from owning shares in ETESAL. This legislation also gave the parameters for the market operation, and the creation of the *Unidad de Transacciones*.

In 2010 the CNE published the National Energy Policy, which will be implemented from 2010 to 2024. The guidelines and objectives of the National Energy Policy are part of specific actions in line with the Five-Year Development Plan and aim to become an instrument for shaping a new energy scenario that will make it possible to expand energy capacity and coverage through efficiency, optimization and savings. It also seeks to contribute to the establishment of a new configuration of the energy matrix based on sustainable development and adequate integration with other key sectors of national life. An updated National Energy Policy is under review as of 2020.

Environmental Legislation for RE:

The Law on Tax Incentives for the Promotion of Renewable Energies in the Generation of Electricity according to Legislative Decree No. 462 of November 8, 2007, its Regulations and the "Technical Regulations to Characterize Projects that Take Advantage of Renewable Sources in the Generation of Electricity" developed by SIGET, regulate all the tax benefits that will be granted only to activities corresponding to projects for the installation of power plants for the generation of electricity, as follows: a. The incentives of the Law are aimed at projects using hydraulic, geothermal, wind, solar and biomass resources. b. Projects with a capacity of up to 20 MW will enjoy for 10 years an exemption from import duties on machinery, equipment, materials and inputs for the pre-investment and investment stages in the construction of the power plants, including the sub-transmission lines required to transport the energy to the transmission or distribution networks. c. Projects of up to 10 MW are exempt from income tax for a period of 10 years. In the case of projects between 10 and 20 MW this exemption will be for a period of five years. In both cases, from the moment the project enters into commercial operation. d. They will enjoy total exemption from the payment of all types of taxes on income directly from the sale of "Certified Emission Reductions" (CERs) under the Clean Development Mechanism (CDM) or similar carbon markets.

Existing/Planned Certificate Systems:

Currently, there is no EAC system operating or planned in the country. The I-REC standard will be implemented to operate without restrictions because the regulation allows it. The central issuer, the Green Certificate Company (GCC) would operate as local issuer until a local or regional organization assumes the role of local issuer in the future.

The information to verify the registration of the devices is not publicly available; however, an official information containing the required details can be asked by the owner, or agent acting on his behalf, to the SIGET.

The generated volume of the devices is provided by the UT through the following link:

https://www.ut.com.sv/reportes?p_auth=NHEVRRRK&p_p_id=MenuReportesEstadisticos_WAR_CompletePublicReports&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_count=1&_MenuReportesEstadisticos_WAR_CompletePublicReports_reportName=08utinyeccionesporoperador

RE Market Potential

El Salvador is rich in RE resources, but the majority of its potential is yet to be exploited. Geothermal energy is abundant given it's positioning along the Pacific Ring of Fire with access to 20 active volcanoes. Estimated geothermal capacity is between 300 to 400 MW but could be higher subject to further geothermal exploration. In 2019, La Geo announced plans to increase capacity at the existing San Vincente and Chinameca geothermal sites, contributing an extra 80 MW in installed capacity (New Energy Events).

Some of its hydropower capacity, which in total is estimated at 2235 MW, has already been exploited, but a plethora of potential remains for mini, small and medium hydropower projects. The El Chaparral dam is in its final phase of construction and is expected to contribute 73 MW to the electricity grid. Average solar irradiation is around 5kWh/m2 and would be most effectively harnessed in the central region. Average wind speeds between 4

and 5 m/s have been recorded across four sites in northern and western El Salvador and a 54 MW windfarm called Ventus is under construction in Metapan.

Market risks and challenges

As there is not a REC market in operation yet, the risks are mainly related to potential changes in the regulation to implement an EAC system in the country, which is very unlikely, and the ones linked to the financial back up of new costumers. The latter can be minimized by following a "Know Your Costumer" procedures carried out by the GCC and I-REC Services.

Extent of Engagement with Government:

Mercados Eléctricos has been promoting I-RECs with SIGET and CNE gathering support for the use of I-RECs in El Salvador and has a great relationship with these institutions, as well with UT and EOR.

Due to the COVID-19 pandemic, it will not be possible to arrange presential meetings between I-REC representatives and government authorities during the coming months. Mercados Eléctricos has offered his support to try to arrange conference calls with some authorities once the peak of the pandemic ends.

Current Environmental Reporting in Energy:

The following are the reports related to the Electricity Market:

Annual Electrical Statistics Bulletin issued by SIGET

National Energy Policy issued by CNE

Indicative Generation Expansion Plan 2019 - 2028 issued by CNE

Any other Relevant Information:

The data of the electricity market 2019 is not yet available. It is expected to be released by the end of this year. According to market experts there is not material change during 2019 from 2018.

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