

CHILE



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GENERAL

1. What is the nature and importance of renewable energy in your country?

Renewable energies have taken a relevant role in the Chilean energy industry and in the long-term economic development of the country. Chile used to have one of the more expensive energy costs in Latin America (in the year 2011, 182.3 US\$/MWh¹), caused mainly by its dependence on imported fuels (coal, petroleum, and natural gas) for purposes of producing energy for supplying the mining regions of the northern part of the country. Also, in the center part of the country, where most people live and which traditionally has been supplied with hydro energy, several dry years reduced the percentage of energy generated by this source, being replaced by the more expensive and polluting fossil fuels.

Since 2013, however, renewable energies have experienced a significant increase in Chile, mainly supported by the great climate conditions for solar photovoltaic projects in the north of Chile, where there is one of the highest solar radiation levels in the world, and high

energy prices that allowed these projects to be profitable without requiring public subsidies.

Installed Capacity		
Energy Source	2011	2016 ³
Gas	33%	23%
Carbon	16%	22%
Oil	14%	14%
Conventional hydroelectric ⁴	34%	27%
Small hydro power	1%	2%
Biomass	1%	2%
Wind	1%	5%
Solar	0%	5%
Geothermal	0%	0%

(Source: Ministry of Energy and Annual Energy Report 2016 of the National Energy Commission)

The entrance of non-conventional renewable energies to the energy matrix helped to solve the existing crisis in the energy sector. A good example is that of the last public tender process for the supply of energy to distribution companies, where the average awarded price was 47.6 US\$/MWh with a relevant share of

¹ Average marginal cost measured in the Substation Quillota 220, of the Central Interconnected System.

² Source: Annual Energy Report 2016 of the National Energy Commission.

³ Total installed capacity = 22,043 MW.

⁴ Hydropower plants of more than 20 MW of installed capacity.

renewable energies. It is worth noting that the best price per MWh was US\$ 29.1, offered by a non-conventional renewable energy company.

Currently, however, the construction of new non-conventional renewable projects has slowed down due to technical and economic reasons.

First, in the middle-northern part of the country, there are transmission restrictions that make solar photovoltaic projects experience difficulties for dispatching energy to the areas of higher demand. As a consequence, these plants are forced to sell energy at a very low price and even in some situations at \$0. This transmission restriction is expected to be solved by 2018-2019, with the commissioning of a 500-kV transmission line of 750 kilometers, between middle-north to the more populated area of central Chile.

Also, due to a reduction of the economic growth that Chile has been experienced since 2014 to date, and a decrease in the international price of minerals during the same period, the demand for energy has been reduced accordingly. The main effect is that marginal costs of energy have experienced a relevant decrease, as mining companies and other industries are demanding less energy. As a consequence, the current scenario for new non-conventional renewable projects is not as encouraging as in the past years.

2. What are the definition and coverage of renewable energy under the relevant legislation?

Under Chilean law, renewable energy does not have a specific regulation, but non-conventional renewable energy does. This distinction impacts mainly in respect to hydro energy projects, as only hydropower plants under 20 MW are considered as a non-renewable energy source.

Pursuant to Article 225 letter aa) of Law No. 4 of 2007, the non-conventional renewable

energy definition covers the following energy sources: (a) energy generated from biomass; (b) hydro energy up to 20 MW; (c) geothermal energy; (d) solar energy; (e) wind energy; (f) the energy of the seas; and (g) other renewable energy sources determined by the National Energy Commission that contribute to diversifying the energy matrix with low environmental impact.

REGULATION

3. How is the renewable energy sector regulated? What are the principal laws and regulations?

3.1. Law No. 4 of 2007

This law corresponds to the Electric Services General Law, which regulates the generation, transmission, and distribution of electric energy; the concessions and tariffs regime; and the role of the state in relation to these subjects.

Law No. 4 of 2007 contains several regulations that are applicable to both conventional projects and non-conventional renewable energy projects, but also some specific rules that have been introduced through subsequent laws, and which are applicable only to non-conventional renewable energy projects.

3.2. Decree No. 244 of 2006

This decree introduced the first regulations in the Chilean legislation in relation to non-conventional renewable energies and also rules the process for connecting projects of less than 9,000 kilowatts of installed capacity into the electric grid.

Pursuant to Decree No. 244, non-conventional renewable energy projects that inject less than 9,000 kilowatts have the following advantages: (a) exemption for paying injection tolls for the usage of the national transmission facilities, and proportional reduction in such tolls with a limit

of 20,000 kilowatts of injections; (b) may operate under the self-dispatch regime⁵; and (c) the operator of these projects may elect to sell the energy at instant marginal cost or at a stabilized price⁶.

3.3. Law 20,257 of 2008 and Law 20,698 of 2013, which amends Law No. 4 of 2007

Law 20,257 sets forth that generation companies shall certify that at least 20%⁷ of the energy withdrawn from the system to supply final consumers in a year has been injected into the system by a non-conventional renewable energy source (whether of its own or hired from a third party). Companies that do not certify the compliance of this obligation are obliged to pay approximately 28 USD per each megawatt/hour of deficit.

Also, this law creates a market for the non-conventional renewable energy certifications, as generation companies that exceed the 20% may transfer the surplus to other generation companies in deficit.

Law 20,698 introduced a public tender mechanism to be carried out by the Ministry of Energy when the missing portion of non-conventional renewable energy to reach 20% is not covered with injections of non-conventional renewable energy of existing or under construction projects. Up to this date, the Ministry of Energy has not performed any tender process, as the injections of energy from non-conventional renewable projects have been superior to the required percentage.

4. What are the principal regulatory bodies in the renewable energy sector?

4.1. The National Electric Coordinator

The National Electric Coordinator is an independent and technical body that is responsible for the coordination of the operation of the facilities connected to the electric system, in order to (a) preserve the security of the system; (b) guarantee the most economic operation of it; and (c) guarantee the open access to the transmission systems.

4.2. The National Energy Commission

Pursuant to Article 6 of the Law Decree No. 2,224 of 1978, as amended, the National Energy Commission will be a technical organization, responsible for analyzing prices, tariffs and technical rules with which energy production, generation, transport and distribution companies must comply, in order to ensure sufficient, safe, quality service, compatible with the most economic operation.

Its functions are as follows: (a) analyze from a technical standpoint the structure and level of the prices and tariffs on energy goods and services, in the cases and manner established by law; (b) set the technical and quality rules that are required for the functioning and operation of energy installations, in the cases indicated by law; (c) supervise and project the current and expected functioning of the energy sector, and propose to the Ministry of Energy the legal and regulatory rules that may be required; and (d) advise the Government, through the Ministry of Energy, on all matters related to the energy sector in order to improve its development.

⁵ For more information please refer to question No. 9.

⁶ For more information please refer to question No. 10.

⁷ The application of Law 20,257 is progressive in time; the 20% requirement is applicable as from the year 2025. This percentage initially was 10%, but Law 20,698 of 2013 raised it to the current 20%.

4.3. *The Ministry of Energy*

The Ministry of Energy was created in 2010, and it is the body responsible for elaborating and coordinating the plans, policies, and rules for the proper operation and development of the energy sector.

4.4. *The Superintendence of Electricity and Fuels*

The Superintendence of Electricity and Fuels, created by Law No. 18,410 of 1985, has the goal, in general terms, to oversee the compliance with the rules in relation to generation, production, storage, transportation and distribution of liquid fuels, gas and electricity, in order to verify the quality of the services for the users and that such operations do not imply a risk to the population.

Also, the Superintendence of Electricity and Fuels is responsible for (a) imposing sanctions due to non-compliance of the above-mentioned rules; (b) the administrative interpretation of the rules applicable to the energy sector; and (c) reviewing and management of the electric concessions applications.

5. **What are the main permits/licenses required for renewable energy projects?**

Renewable energy projects do not require specific permits or licenses other than those that are required for any other kind of energy project. These main permits and licenses are the following:

5.1. *Environmental authorization*

Pursuant to Article 10 c) of Law 19,300 of 1994, an electric power plant over 3 MW, regardless of its energy source, must be environmentally assessed under the Environmental Impact Assessment System. Such assessment is performed through an administrative procedure in which a wide range of public agencies with environmental faculties participate by evaluating and making observations on the

aspects of the project under their competence. The process concludes with the issuance of an Environmental Assessment Resolution approving or rejecting the relevant project.

Transmission lines over 23 kV and electric substations must be environmentally assessed under this procedure as well.

5.2. *Electric Concession*

Although it is not obligatory, for the construction of transmission lines, electric substations, and hydropower plants, the developer may obtain a definitive electric concession from the Ministry of Energy, which allows the owner of the project to impose an electric easement over the land in exchange for the payment of an indemnification to the owner, without needing the consent of the latter.

Also, pursuant Article 34 bis of Law No. 4 of 2007, the holder of an electric concession has an additional protection vis-à-vis the owners of the mining concessions overlapped to the project.

In Chile, the owner of the land may be different from the owner of mining concessions, and sometimes this creates conflicts between them. In particular, the owner of the mining concession may file an action called a “New Works Claim”, which seeks to suspend or reverse the construction of new projects that may affect the rights of the mining concessionaire. Upon the filing of the New Works Claim, the judge has to order the provisional suspension of the works until the action is solved. This may entail a serious risk to a project, and financial entities are reluctant to finance projects that have not secured the mining properties that are overlapped to the project. However, if the developer of the project has obtained an electric concession, in case the mining concessionaire files a New Works Claim, the judge will revoke the

suspension order if the developer provides a sufficient security.

5.3. Sectoral permits

Several permits are usually required for the construction and operation of an energy project, each of which needs to be filed before and granted by the relevant sectoral authority with competence in the matter. For instance, some common sectoral permits that are required for energy projects are⁸: authorization for building infrastructure facilities in rural areas; building permit; authorization for forest-clearing operations; permit for crossing public roads with transmission lines; authorization for capturing wildlife species; authorization to execute an access to a national public road; sanitary report; and authorization to store hazardous and non-hazardous waste, among others.

6. Is there a category of “license-exempt generation”? If so, does it cover some types of renewable energy based generation?

As explained above, Article 10 c) of Law 19,300 of 1994 sets forth that power plants over 3 MW must be assessed with respect to their environmental impacts through the Environmental Impact Assessment System. On the contrary, power plants under 3 MW, regardless of their energy source, do not require this assessment⁹.

7. Has there been any reform related to renewable energy regulations since 2016? Do you expect any reform/change in the near future?

During 2016, a major amendment was made to Law No. 4 of 2007 regarding transmission

aspects, which, however, did not introduce new regulations or amend the existing ones in relation to renewable energy.

It is expected that in the near future, new regulations in relation to ancillary services will be introduced, as conventional power generators claim that currently the system is not properly paying them for services which are provided due to the intermittence of non-conventional renewable energies.

INCENTIVES

8. Are tax advantages available to renewable energy generation companies?

There is a tax advantage which allows construction companies to have a tax credit for the installation of thermal solar systems in new buildings.

The tax credit will be determined as a variable percentage of the cost of a thermal solar system plus the cost of its installation.

The applicable percentage will depend on the construction cost of the building: 100% for buildings which cost up to USD 80,000; 40% for buildings which costs between USD 80,000 and USD 120,000; 20% for buildings which cost between USD 120,000 and USD 180,000; and 0% for buildings which cost more than USD 180,000.

This tax advantage is available until 2020.

⁸ The complete list of sectoral permits required for a particular project will depend on the specific characteristics of it, and the activities necessary for its construction and operation.

⁹ If a project has less than 3 MW of installed capacity it may be required to enter into the Environmental Impact Assessment System if it generates other environmental impacts (for instance, if it is placed in a protected wild area).

9. Is there a purchase guarantee given by the relevant legislation for electricity generated by renewable energy companies?

Pursuant to Decree No. 244 of 2006, non-conventional renewable energy projects of less than 9 MW may operate under the self-dispatch regime, which means that the operator of those projects will determine the power and energy to inject into the grid, regardless of the economic dispatch order set by the National Electric Coordinator. This right guarantees that the energy produced by these projects will be purchased in the spot market.

Also, there are periodic tender processes carried out by the National Energy Commission, which is intended to award an energy supply for distribution companies through power purchase agreements. Although both renewable energy and conventional power producers may participate in them, the past two tender processes were awarded mainly to renewable energy power companies.

10. Is there a minimum price guarantee given by the relevant legislation for electricity generated by renewable energy companies?

Pursuant to Decree No. 244 of 2006, non-conventional renewable energy projects of less than 9 MW may elect to sell the injected energy (i) at instant marginal cost or (ii) at a stabilized price.

The stabilized price corresponds to the nodal price for the short term, which is determined by the National Energy Commission every 6

months, considering (a) the basic price of the energy, and (b) the basic price of the peak power¹⁰.

Currently, under Chilean market conditions, the stabilized price is one of the few ways (along with a power purchase agreement with distribution companies or with industrial clients) that an energy company may obtain steady revenue in order to get the renewable energy project financed.

11. Has the Paris Agreement under the United Nations Framework Convention on Climate Change been ratified? If yes, what are the undertakings of your Country in the NDC (national determined contributions) submitted for the first five-year period?

Yes, Chile ratified the Paris Agreement on February 10, 2017. No commitments were undertaken for the first five-year period, but for the year 2030 the following commitments were made: (a) reducing the CO₂ emissions in a 30% per GDP unit to the year 2030, in comparison to the levels reached in the year 2007; (b) to increase the reduction of CO₂ emissions by 35% to 45% in case of receiving international support; and (c) to recover 100,000 hectares of forest by the year 2030.

12. Is there a carbon market or carbon credits mechanism in your jurisdiction?

Chile ratified the Kyoto Protocol to the United Nations Framework Convention on Climate Change in 2002, and this way can participate in

¹⁰ (a) “Basic price of the energy” corresponds to the average marginal cost of the energy of the electric system operating at the minimum updated operation and rationing cost, and (b) “basic price of the peak power” corresponds to the annual marginal cost for increasing the installed capacity of the electric system considering the most economic

generation units, in order to supply additional power during the hours of the annual higher demand of the electric system, increased in a percentage equal to the margin of theoretical power reserve of the electric system.

the carbon market through the Clean Development Mechanism.

Also, there is a private carbon stock exchange created in 2011 by private companies which is not governed by any regulation, where private and public entities and even individuals may trade CO₂ reductions.

13. Do renewable energy-based power plants have priority for connection to the grid?

There is no special priority for connection to the grid for renewable energy based power plants. However, they are normally dispatched considering their low operational costs compared with conventional projects. Additionally, as we mentioned, non-conventional renewable energy projects of less than 9 MW may operate under the self-dispatch regime.

14. Is there an incentive for domestic (local) manufacturing of equipment or materials used in the construction of renewable energy based power plants?

There are no special incentives in Chile for local manufacturing of equipment or materials used in the construction of renewable energy based power plants.

15. What other incentives are available to renewable energy generation companies?

Article 2 of Law No. 20,897 of 2016, which amends Law No. 4 of 2007

Law No. 20,897 of 2016 introduced a new paragraph to Article 34 bis of Law No. 4 of

2007. Pursuant to this Article, the developers of a non-conventional renewable energy based project have the same benefit described in Section 5.2 above, as if they were holders of an electric concession.

This simplifies the development of non-conventional renewable energy projects by giving a protection against the filing of a New Works Claim by mining concessionaires, without requiring them to have previously obtained an electric concession.

Law No. 20,571 of 2012, which amends Law No. 4 of 2007

This Law introduced the new Article 149 bis into Law No. 4 of 2007, incorporating a net billing regulation into Chilean law. Pursuant to this Article, regulated final users¹¹ that have their own efficient cogeneration facilities or non-conventional renewable energy sources with an installed capacity of up to 100 kilowatts will have the right to inject and sell the generated energy into the electric distribution grid.

STATISTICS

16. What is the percentage of electricity generated based on each type of renewable energy source as a proportion of the total generation of electricity on a country-wide scale?

In Chile, there are two main different electric interconnected systems, (1) the Central Interconnected System, and (2) the Northern Interconnected System¹².

¹¹ Regulated final users are those whose energy supply prices are fixed by the authority. Pursuant to Article 147 of Law No. 4 of 2007, this situation is mainly applicable to users with a connected power equal to

or less than 5,000 kilowatts located within a distribution concession area.

¹² The two systems are projected to be connected to each other during 2017. In the meantime, there are

Central Interconnected System	
Energy Source	% of the total generation capacity (total generation capacity March 2017 = 4,781 GWh)
Solar	5%
Wind	4%
Hydro	26%
Biomass	5%

(Source: National Electric Coordinator – Energy Report April 2017)

Northern Interconnected System	
Energy Source	% of the total generation capacity of the system (total generation capacity March 2017 = 1,350 GWh)
Solar	8%
Wind	3%
Hydro	1%
Biomass	0%

(Source: National Electric Coordinator – Energy Report April 2017)

With respect to the total installed capacity on a country-wide scale, the share of renewable energy is as follows:

Country-wide scale	
Energy Source	% of the total installed capacity (total installed capacity April 2017 = 22,840.91 MW)
Solar	6.68%
Wind	5.88%
Hydro	27.08% (mini hydro = 1.95%)
Biomass	2.01%

(Source: www.energiabierta.cl)

OTHER

17. Is there anything else you wish to add?

No.

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no statistics on a country-wide scale, but only for each interconnected system.