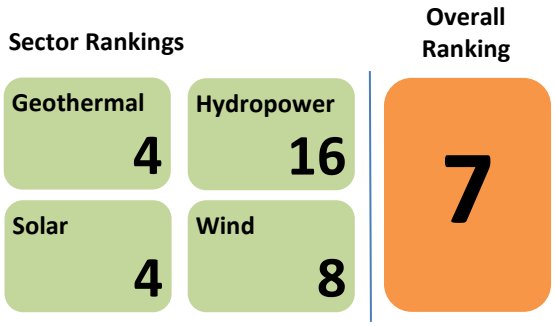
2016 Top Markets Report Renewable Energy Country Case Study

Chile

Type: Small Market; Large Market Share

Chile's resource potential, its traditionally high electricity prices, its stable business climate, and the expected market share captured by U.S. suppliers strongly suggests export competitiveness across each renewable energy technology through 2020. Chile is one of the few markets that should support exports in each renewable energy technology and, as such, remains a critical market for many U.S. exporters. Most export opportunities are expected in the solar sector, including both PV and Concentrated Solar Power (CSP).



Few countries have as much renewable energy potential, and as much need for renewable energy as Chile. The Atacama Desert in Northern Chile is widely considered the world's best solar resource. Similarly, strong wind, geothermal, and hydropower resources exist across the country.

Partly as a result of this potential and partly because Chile has limited fossil fuel resources, Chilean policy-makers have made a firm commitment to support clean energy investment. Today, the country is home to a prodigious array of renewable energy projects across each technology subsector – many with the expectation of selling electricity on the spot market (almost unique among clean energy projects globally).

While most development is expected in the solar sector, export opportunities are expected across all clean energy technologies and services. Chile is one of only four markets to rank in the top ten in three different subsectors (along with Canada, Mexico, and Brazil), and ranks in the top 20 in all four.

Overview of Renewable Energy Market

Chile must rely on imported oil and gas (electricity) to fuel its economic growth, which has been consistent and robust for over a decade. Imports have grown dramatically as a result, rising from 42 percent of all energy consumption in 1980 to almost 75 percent today. The country's import dependence has caused electricity spot market prices to reach an average of $112.3/MWh on the country's main electricity grid in 2013 – far more than other regional markets and a distinct competitiveness disadvantage for the Chilean economy.

The high prices have in turn led to an incredibly robust and attractive renewable energy market, supported by both private-sector consumers in Chile – namely, large mining operations – and the Chilean government. The country is also characterized by

wind and solar projects being developed and financed for the spot market or single offtakers.[1] While low oil prices may make imports less problematic for the Chilean economy, ITA believes electricity prices will remain high enough – and volatile enough – to make it likely that Chile will continue to invest in renewable energy going forward.

The Chilean government has long emphasized the need for diversification, adopting a bill in 2013 to set renewables at 20 percent of the energy mix by 2025. In January 2016, President Michelle Bachelet signed Chile's new energy strategy, "Energy 2050," which set a target of generating 70 percent of the country's electricity from renewables by 2050. [2] Energy 2050 grew out of the President's 2014 Energy Agenda, which highlighted Chile's deep commitment towards developing its renewable energy sector.

Moreover, Chile became the first country in Latin America to impose a carbon tax when in September 2014 its Congress passed the "green tax" (*impuesto verde*). Becoming operational in 2017, the tax is set to impose a $5 per tonne of CO2 tax on emitters with installed capacity equal to or larger than 50 MW, excluding those that use biomass as a feedstock.[3] This tax is widely expected to improve the cost-competitiveness of investing in renewable power sources. The tax is the latest in a series of favorable regulations set by Chile, in addition to net metering, energy auctions, attractive tax policies, and utility obligation quotas.

Challenges and Barriers to Renewable Energy Exports

Despite its projected growth, Chile still faces transmission challenges, which remain both persistent and disruptive.[4] The country's electricity infrastructure is entirely privatized and its grid is split in four systems. The Chilean Government thus faces hurdles incentivizing the development of new transmission lines, particularly in remote areas where renewable energy projects are often located.[5]

Chilean utilities, not having experience with large amounts of renewable power, have also shown signs of uneasiness about allowing additional renewable energy onto their electricity grids. Nevertheless, utility operators may have no choice but to support the use of intermittent renewable sources in their power mix, as the Chilean Government has announced that renewable energy will account for more than 75 percent of the nearly 5 GW of new capacity added to Chile main electricity grid through 2030.

The Chilean government has also announced plans for a transmission line between Mejillones and Copiapó that should be completed by 2017.[6] This transmission line will unify two grids: SING (Sistema Interconectado del Norte Grande) and SIC (Sistema Interconectado Central), accounting for almost 90 percent of Chile's grid. In addition, in January 2016, Chile's Council of Deputies approved restructuring of the transmission system to improve overall efficiency, including the establishment of a new system operator.[7]

Growth in the Chilean economy remains largely tied to the price of minerals and other commodities. Given Chile's reliance on fuel imports, electricity pricing is tied to fluctuating global prices for oil, natural gas, and coal.[8] Chile relies mostly on market conditions to support clean energy development (unlike other markets), because of these changes in market dynamics and their influence on investment. However, in late 2015, Deutsche Bank reported that the cost of solar and wind energy in Chile is lower than fossil fuels, with solar energy as the cheapest form of electricity available.[9] Generally, project developers appear to be gaining greater access to both international and local financiers and this should support further capacity installations.

Opportunities for U.S. Companies

U.S. exporters are well-positioned in Chile due to the existing U.S.-Chile Free Trade Agreement and the strong bilateral commercial relationship between the United States and Chile.

<u>Solar</u>

Chile ranks fourth on ITA's list of largest projected solar export markets through 2016 – down two spots from last year's ranking. The drop is a result of fewer projects expected to come online; not a loss of market share captured by U.S. firms. Chile's Environmental Assessment Service recently approved 698 MW of new solar projects in September 2014, a number far smaller than other potential solar markets. [10]

While capacity growth may be somewhat limited in the short-term, ITA expects the solar industry to account for over half of all renewable energy exports to Chile through 2016. With no solar manufacturing capacity currently in operation, all of Chile's solar development will be met by imports, creating an important opportunity for U.S. equipment and service providers.

In October 2014, President Bachelet helped break ground on a 141 MW solar project in Atacama Region III, which is being developed by First Solar.[11] Once completed, the project will be the largest solar project in Latin America and should drive further interest in the sector, particularly for large mining companies with operations in the Atacama region.

Going forward, it will be important to keep Chilean decision-makers aware of the latest U.S. solar technology developments. In particular, Chile's mining sector has routinely required solar investments to demonstrate an energy storage component to fuel their 24/7 operations. Demonstrating advances in storage related to concentrated solar power may therefore help create opportunities for firms able to meet these requirements.

Wind

Chile's wind development is expected to be limited in both the near and medium-term. Some development should take place, as the country's high priced electricity and tremendous resource potential make projects attractive to developers. For example, the Italian firm Enel Green Power constructed a 61 MW wind project, which was completed in March 2015.[12]

Hydropower

Chile ranked highly in 2015 for projected hydropower exports. In fact, most opportunities are in the small- to medium-sized projects, such as run-of-river hydropower projects in low-flow areas like irrigation and already constructed navigational dams. However, as Chile's import market grows for this type of hydro equipment, U.S. exporters have unfortunately lost some market share.

ITA does not expect significant opportunities in the large hydropower sector. In early 2014, the Chilean Government cancelled the environmental permit for the proposed 2.7 GW HydroAysen project in Patagonia, likely signaling a dampening of support for large hydro development in the future.[13]

Geothermal

Despite its vast geothermal potential, Chile has commissioned no projects to date, largely due to the existence of cheaper renewable alternatives. Chile has three geothermal fields in advanced development phases, Cerro Pabellon (50MW), Curacautin (70MW) and Mariposa (50MW), alongside more than 75 geothermal exploration concessions. State-owned Empresa Nacional del Petróleo (ENAP) has estimated that Chile's total geothermal potential could reach 3,350MW.[14]

Most of Chile's geothermal development, however, will be brought online between 2017 and 2020.[15] U.S. suppliers are expected to capture around 35 percent of Chile's geothermal import market, making it one of the most U.S.-friendly business destinations of any renewable energy market globally.

[1] Bloomberg New Energy Finance, "Climatescope 2014: Chile."
[2] Business Monitor International, "Chile Renewables Report Q2 2016," February 2015.
[3] Bloomberg New Energy Finance, "Climatescope 2014: Chile."
[4] Business Monitor International, "Chile Renewables Report ," 1 January 2015.
[5] Government of Chile, NES, pp. 28-29.
[6] Business Monitor International, "Chile Renewables Report Q2 2016," February 2016.
[7] PV Magazine, "Chile: Transelec ganó licitación de obras en interconexión del SIC y SING," 17 March 2016. http://www.pv-magazine-latam.com/noticias/detalles/articulo/chile--transelec-gan-licitacin-de-obras-en-interconexin-del-sic-y-sing_100022458/
[8] Business Monitor International, "Chile Renewables Report Q2 2016," February 2015.
[9] PV Magazine, "Chile: Solar cheaper than fossil fuels," 5 November 2015. http://www.pv-magazine.com/news/details/beitrag/chile--solar-cheaper-than-fossil-fuels_100021869/#axzz43h48KGav
[10] Business Monitor International, "Chile Renewables Report ," 1 January 2015.
[11] La Nación, "Bachelet inaugural primera planta de energía solar en Atacama," 17 October 2014.http://www.lanacion.cl/noticias/regiones/atacama/bachelet-inaugura-primera-planta-de-energia-solar-en-atacama/2014-10-17/142439.html
[12] Enel, "Enel Green Power brings Talinay Poniente wind farm online in Chile," 11 March 2015. https://www.enelgreenpower.com/ewcm/salastampa/comunicati_eng/1663411-1_PDF-1.pdf
[13] Bloomberg New Energy Finance, "Climatescope 2014: Chile."
[14] Business Monitor International, "Chile Renewables Report Q2 2016," February 2016.
[15] Country Energy Profile: Chile – Clean Energy Information Portal. www.reegle.info/countries/chile-energy-profile/CL