

Mission Innovation: Chilean Energy Innovation Approach

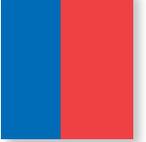
Overview: The Long Term Energy Policy 2050

For Chile and its path to development, energy is a key strategic factor for reaching the economic and social development goals. When energy is obtained and used optimally, a virtuous circle is generated, and directly impacts economic growth, offers opportunities to care for the environment, and favors people's well-being, thus allowing society to move towards equitable and sustainable development.

In the context of the Energy Agenda, -a road map for the development of our country's actions in this sector- a discussion process was carried out including key stakeholders from the public sector, industry, academia, civil society, people from a number of regions of the country, and a variety of representative citizens. The goal was to develop the country's long-term Energy Policy. An Advisory Committee led by the Minister of Energy and composed of key participants from the sector was convened with regional and national representation. The members form part of various ministries and public institutions, trade associations, civil society, and Chilean universities.

The Energy Policy proposes a vision of Chile's energy sector by the year **2050** as being **reliable, inclusive, competitive** and **sustainable**. This vision is part of a systemic approach in which the main goal is to achieve and maintain the reliability of the entire energy system while meeting sustainability and inclusion criteria and contributing to the competitiveness of the nation's economy. These attributes will allow us to move forward towards sustainable energy in all of its dimensions.

In order to make this vision a reality by 2050, the Energy Policy is sustained by four pillars: **Security and Quality Supply, Energy as a Driver for Development, Environmentally-friendly Energy,** and **Energy Efficiency and Energy Education**. The proposed measures and action plans shall be developed on the basis of these pillars between 2016 and the year 2050.



Main Goals of the Energy Policy – 2035



1

Chile's interconnection with the other SINEA member countries, and other South American nations, especially the members of MERCOSUR, is a reality.

2

Electricity outages **do not exceed 4 hours/year in any locality in Chile**, except in cases of force majeure.

3

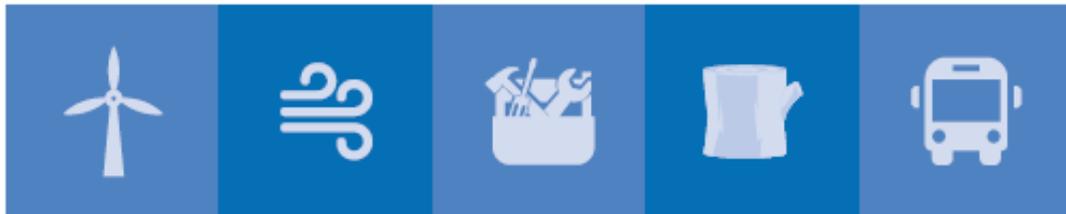
100% of homes of vulnerable families have continuous quality access to energy services.

4

All energy projects under way in Chile have adopted mechanisms for associativity between communities and the private sector, thereby promoting local development and improving implementation of the projects.

5

Chile is among the 5 OECD countries with the lowest average residential and industrial electricity prices.



6

At least 60% of the electricity generated in Chile comes from renewable energy sources.

7

By 2030, Chile has reduced its GHG emissions by at least 30% compared to 2007.

8

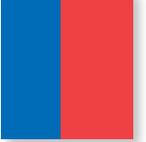
100% of the large consumers of energy (industrial, mining and transportation sectors) make efficient use of energy, with proactive energy management systems and the implementation of energy efficiency measures.

9

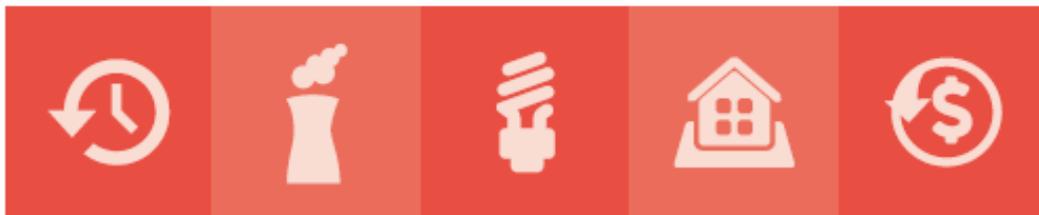
By 2035, all local municipalities have adopted regulations classifying forest biomass as a solid fuel.

10

Energy efficiency is one of the aspects evaluated in **tenders for all new vehicles used in public transportation systems**.



Main Goals of the Energy Policy - 2050



1

Electricity outages do not exceed **1 hour/year in any locality in Chile**, except in cases of force majeure.

2

The **GHG emissions of Chile's energy sector** are consistent with the thresholds defined by international guidelines and with the corresponding national emissions reduction goal, making an important contribution to achieving a **low-carbon economy**.

3

Ensure **universal and equitable access** to modern, reliable and affordable energy services for the entire population.

4

Regional and local territorial planning and land-use instruments are in line with the guidelines of the Energy Policy.

5

Chile is among the 3 OECD countries with the lowest average residential and industrial electricity prices.



6

At least 70% of the electricity generated in Chile comes from renewable energy sources.

7

Growth of energy consumption is decoupled from GDP growth.

8

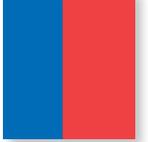
100% of new buildings meet OECD standards for efficient construction, and are fitted with intelligent energy control and management systems.

9

100% of the major categories of appliances and equipment sold in Chile are energy-efficient.

10

Energy culture is installed at all levels of society, including energy producers, distributors, consumers and users.



Clean Energy Definition

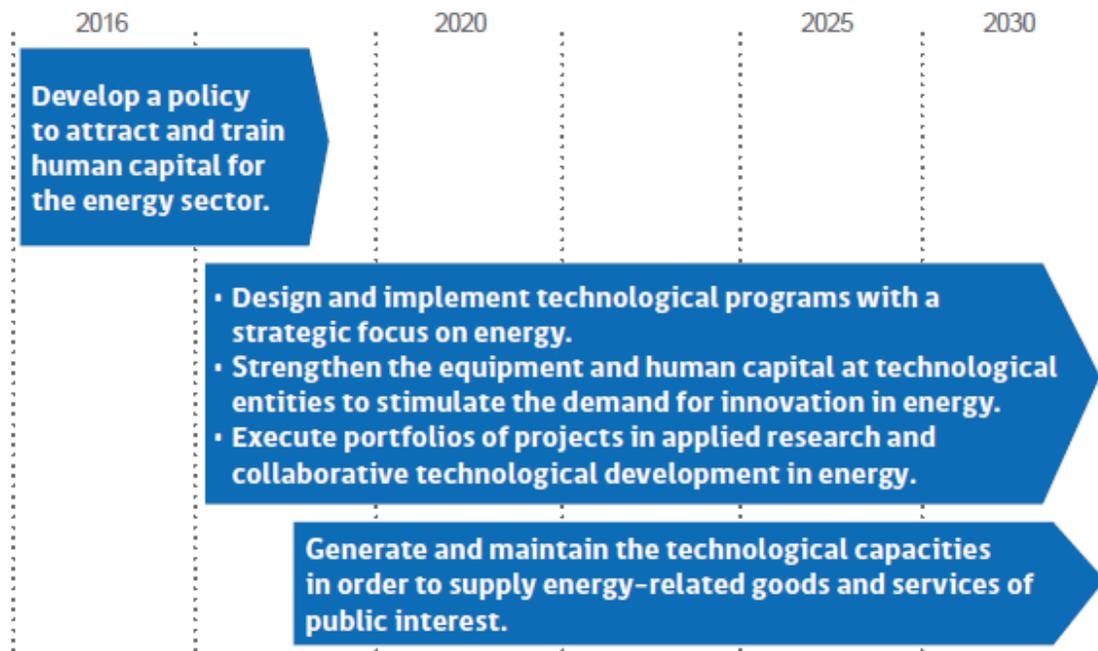
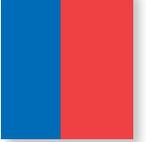
For Chile, energy is a driving force for the country's development, but not just any type of development: Chile's development must be respectful of people, of the environment and of productivity, and must ensure continuous improvement of living conditions. So according to this statement, and considering that there is no official definition of this concept, clean energy will be understood as all kinds of energy that contribute to reaching this multidimensional development.

Public energy innovation baseline 2015

	FY 2015¹ MI Baseline	FY 2016 MI Budget	FY 2015 vs. FY 2016 Mission Innovation	
	(thousand USD)	(thousand USD)	(thousand USD)	%
Renewable Energy	3,551.7	6,119.9	2,568.2	72%
Solar Energy	1,246.2	5,012.6	3,766.5	
Marine Energy	-	692.2	692.2	
Biofuels	1,890.5	-	1,890.5	
Clean Energy Access	415.1	415.1	-	
Energy Efficiency	633.8	633.8	-	179%
Mining Technologies	633.8	-	633.8	
Building Technologies	-	1,769.8	633.8	
Total	4,185.6	7,889.2	3,703.6	88%

The Chilean target for doubling governmental investment in clean energy innovation as part of Mission Innovation is USD 9 Million by the year 2020. However, we expected that this target will be surpassed.

¹ These figures correspond to an updated calculation of Chile's governmental investment in clean energy innovation in the year 2015.



General remarks

Currently Chile is pushing a science, technology and innovation strategy, identifying the next research and development focus, beyond solar energy, as was already defined and agreed upon. According to the Long Term Energy Policy, the goal for innovation by 2035 is “Chile has become an exporter of technology and services for the solar industry”, and by 2050 are “Chile has become an exporter of technology and services for specific energy innovations” and “Innovation policies in the energy industry contribute to achieving a reduction in energy consumption.”

The Chilean Government has developed a collaborative process to create a 2025 Road Map called the Strategic Solar Program, which seeks to take advantage of the Atacama Desert’s unique features to develop a national solar power industry. The Strategic Solar Program Roadmap is structured on the following guidelines: industrial development, human capital development, technological development and strengthening quality infrastructure. To this end, an initial portfolio of 50 initiatives was identified, with a total budget of US\$800 million.

Among the efforts focused on technological development, the Desert Module and System Technology Program (DMSTP) can be highlighted. This program seeks to adapt and/or develop new materials, components and O&M services for photovoltaic systems to ensure their durability and performance under desert climate conditions. This shall contribute to the installation of



technological capabilities and foster the creation of a national business ecosystem for the solar power industry in partnership with international companies. A competitive contest for project proposals is open through the first quarter of 2017, and US\$17 million will be awarded (US\$ 12 million allocated by the Chilean government, and US\$5 from private sector contributions).