

ENERGY 2050: A PARTICIPATORY PROCESS FOR A LONG-TERM ENERGY POLICY AND ITS ROLE IN CLIMATE CHANGE POLICIES IN CHILE

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Chile's energy sector—and the electricity sector in particular—has been under scrutiny during the last 15 years for different reasons. Energy markets and the way society relates to energy production and consumption have changed profoundly for many reasons in recent decades.

One of these changes has come in the way electricity is produced. Chile used to depend on imported natural gas from Argentina and was forced to invest in more generation capacity when those imports were dramatically and rapidly reduced due to the economic crisis in the neighboring country. For a short time, diesel generation supplied the shortfall, but new coal plants were soon under construction.

The way people related to the development of electricity infrastructure also changed. Large hydropower projects, new thermal plants, and even renewables like wind turbines were opposed and often blocked. The difficulties encountered by proposed electricity generation projects included a lack of compatibility with local conditions, growing citizen concern about socioenvironmental impacts, a weakened and insufficient energy and environmental institutional framework to address the great energy challenge, and citizen mistrust of corporations and the state.¹

Combined with growing demand, the slowed expansion of generation capacity led to a rapid rise in electricity prices, putting pressure on the competitiveness of the Chilean economy. Challenging as these circumstances were, they also made

it possible to fashion a long-term energy policy in a developing country, with clear goals for sustainability, without neglecting short-term issues. They also enabled the inclusion, for the first time, of climate change in the energy discussion. This article describes the opportunity, the process, the lessons learned, and the outlook for Energy 2050, Chile's long-term energy policy, and its relationship to climate change policy in the country.

THE BACKGROUND OF ENERGY 2050

Addressing the challenges in Chile's energy sector required not only traditional technical solutions but also, and crucially, great political efforts to build consensus. Before Energy 2050, different initiatives developed analysis and proposals for the sector. These efforts built significant technical capacities that proved very useful during the Energy 2050 process.

The public-private initiative Escenarios Energéticos 2030 was formed in 2009 to develop a common view of the energy sector's future. The initiative, which included representatives of the public and private sectors, academia, and civil society, was one of the main advocates for planning Chile's energy policy. It developed different scenarios for the electricity system, showing the alternative paths to development of renewables (see Escenarios Energéticos n.d.).

In 2011, the first government (2010–14) of President Sebastián Piñera invited a number of actors to form the Advisory Commission for Electrical Development (Comisión Asesora de Desarrollo Energético, or CADE) in order to make recommendations for the development of the sector. Not all sectors felt represented by CADE, so the Parliamentary Technical Citizen Commission (Comisión Ciudadana Técnico-

Parlamentaria, or CCTP) was launched. The two commissions worked separately and delivered independent proposals to the government. Although the groups supported rather different long-term visions for the sector, they largely agreed on what the main issues were affecting it, and suggested varying solutions. For example, to address the problem of concentration in the generation sector, the CCTP proposed special auctions for new entrants, while the CADE report recommended lowering barriers to entry in this market. The CCTP also suggested actions to promote energy efficiency and biomass use, while CADE focused more on the electricity sector.

Another important source of data and experience for long-term analysis came from the Mitigation Action Plans and Scenarios (MAPS) project, in which seven ministries (Foreign Affairs, Finance, Transport and Telecommunications, Agriculture, Energy, Environment, and Mining) worked together to develop options for climate change mitigation. Launched in March 2012, MAPS brought together specialized research and a multistakeholder participatory process. This combination enabled the identification of action plans and scenarios to mitigate climate change in Chile. All this background was very important for the climate change discussion in Energy 2050.

Undoubtedly, these efforts helped build a critical mass of diagnosis among the key actors. Taken together, these elements constituted the necessary—if in themselves insufficient—basis for the construction of a common vision. Informed by the Escenarios Energéticos 2030 analysis and the MAPS experience, as well as the CADE and the CCTP reports, the Ministry of Energy launched the Energy 2050 process in the second half of 2014.²

DESIGN OF A PARTICIPATORY PROCESS FOR THE DEVELOPMENT OF LONG-TERM ENERGY POLICY

To discuss and build its energy policy, the government of President Michelle Bachelet (2014–18) committed to creating a planning process that would meet the standard of the Organisation for Economic Co-operation and Development (OECD).³ Since this standard calls for participation, one of the main features of Energy 2050 was the Participatory Process for Energy Policy (Proceso Participativo de la Política Energética), which sought to promote an open process. The goal was a multisector effort that would articulate a shared vision for the future development of the energy sector, including a process of social, political, and technical validation.

This process was to build a comprehensive policy that would look beyond the electricity sector and consider the energy sector systemically, including such issues as the use of biomass and how to foster energy innovation. As a long-term policy, it should draft guidelines for the sector with a view to the future. Finally, it had to be a legitimate process, with sociopolitical validation enabling it to transcend individual governments and become state policy.

International experience with respect to energy policy and the design of climate change policies, in particular in OECD countries, was relevant to the design of Energy 2050 as a four-step process.

The first step was to design a short-term strategy, the “Energy Agenda,” which was developed in the first 100 days of Bachelet’s administration. This instrument dealt with the most urgent issues, separating the long-term discussion from short-term problems. The choice to deliver an Energy Agenda for the next four years and a long-term policy for the next 30 years made it

crucial to separate the conversation about structural changes from that on urgent matters in the sector. This strategy had two effects. First, it enabled participants to consider short-term problems with a long-term perspective. Separating topics that were urgent (i.e., high electricity prices) to discuss first from others that were less urgent (i.e., the share of renewables in the electricity mix) made it possible to establish a common ground on which all actors in the sector could work. Second, it decoupled the long-term discussion from contingent issues, like discussion of Hydroaysén, a large hydropower plant proposed for the south of Chile.⁴

The second stage consisted of bridging the Energy Agenda and the long-term energy policy. Soon after the agenda was made public, several thematic roundtables were launched, focusing on issues highlighted in the agenda. The topics discussed at each roundtable were energy efficiency, hydroelectric energy, thermoelectric energy, nonconventional renewables, transmission and gas networks, innovation, efficient heating and wood energy, Indigenous affairs, land use planning, and associativity. Additionally, for each roundtable, workshops were held in every region of the country to disseminate its goals. Invitations were sent to academics, citizens, government officials, and private firms. The participatory workshops and roundtables were designed to generate knowledge that would contribute to discussion of the long-term energy policy.

The third stage included a steering committee, convened and chaired by the minister of energy, that was charged with providing a strategic orientation for the process and developing the vision of the roadmap to 2050 (Comité Consultivo de Energía, 2015). The panel was diverse by design, with its 27 members⁵ including representatives of not only energy companies and government ministries but also nongovernmental organizations, civil society, the labor movement, and academia. Some of these organizations had participated in CADE, the CCTP, Energy Scenarios 2030, or MAPS Chile.⁶

The success of Energy 2050 would require strong support for the whole process. For that reason, three supporting services were hired: an academic group of experts, technical support staff for meetings and document preparation, and an expert facilitator for all committee meetings. These professionals provided the committee with a methodology, gave it rigorous and impartial information, and facilitated consensus. Supporting services like these, which were new to the design of public policies in Chile, were key to the delivery of high-quality work. The entire process was coordinated by an executive secretariat empaneled by the Ministry of Energy.

The steering committee met weekly for nine months to deliver the roadmap to 2050. This document considered climate change as an essential factor in long-term energy policy, taking into account trends in greenhouse gas (GHG) emissions, compliance with international agreements, promotion of the carbon capture in natural systems, low-carbon development, and adaptation to climate change. Among its policy recommendations, the roadmap included mitigation and adaptation actions. The recommended goal for mitigation was that the electricity sector's GHG emissions be consistent with the limits defined by science at the global level and with the corresponding national reduction goal, and that the mitigation measures it proposed be cost-effective. Regarding adaptation, the roadmap suggested that the estimated potential of renewable energies be corrected to take into account their climate vulnerability.

The final stage was reserved for the Ministry of Energy. Since the ministry had to prepare the long-term energy policy document using the roadmap to 2050 as its main source, its active participation in the committee discussions was essential. In general, the ministry included the roadmap's recommendations, but it complemented them with a broader perspective. One example was the renewable energy goal. In Chile and in the rest

of the world, energy policies have chosen renewable targets as emblems of the sustainable future to be achieved, in direct relationship with nationally defined contributions (NDCs) to reduce GHG emissions. The issue had sparked controversy among steering committee members. Although the agreement was to aim for 70 percent renewables in the energy mix by 2050, some members advocated a goal of 100 percent. The ministry decided to keep the 70 percent goal for 2050 but added an intermediate goal of 60 percent renewables for 2035.

ENERGY 2050'S MAIN GOALS

Energy 2050 proposed the vision of a reliable, environmentally sustainable, inclusive, and competitive energy sector. To reach this goal, the policy's recommendations rested on four balanced pillars, none of which would dominate the others.

- ◆ **Security and quality of supply:** To heighten security, the energy policy document included the goal of interconnection with other South American nations by 2035. To improve quality, it set the goal of limiting power outages in all regions to an average of less than one hour total per year by 2050, excluding cases of force majeure.
- ◆ **Energy as a development engine:** The policy also stated that an essential condition for sustainable development was to make Chile one of the three OECD member states with the lowest average residential and industrial electricity prices by 2050.
- ◆ **Energy compatible with the environment:** The policy reflected a commitment to addressing the challenge of climate change by supporting a transition toward an energy matrix significantly lower in carbon, with at least a 30 percent reduction in Chile's GHG emissions by 2030, in accordance with the country's NDC. If international financing is secured, this goal could increase to a 45 percent reduction in CO₂ emissions per unit of gross domestic product.⁷

- ◆ **Efficiency and energy education:** In terms of energy efficiency, the policy set a goal of decoupling national growth from increased energy consumption. For education, it set the objective of cultivating greater understanding of energy use among the entire population.

The energy policy supports a gradual transition toward an economy, and an energy matrix, significantly lower in carbon emissions by 2050. Making the best use of renewable energy resources, using low emission fuels, and exploring more extensive energy efficiency measures are crucial elements in this transition.

In terms of Chile's NDC, the mitigation plan for the energy sector launched in 2017 included several policies from Energy 2050.⁸ With respect to electricity generation, the key goals included the use of 60 percent renewables and 50 percent low emission fuels by 2035. For transportation, industry, and residential consumers, the key goals from Energy 2050 included energy efficiency measures.

LESSONS FROM ENERGY 2050

For Chile, Energy 2050 represented a new and challenging area of action. To be successful, its implementation—which started in 2016—will have to proceed through clearly identified stages with appropriate commitments and adequate supervision. So far, the Ministry of Energy has published two annual monitoring reports that include all actions reported by the various state bodies in pursuit of the 2050 energy targets.⁹ However, these reports were prepared without participation from stakeholders outside the public sector. In the future, it will be important to design a monitoring process in which anyone can participate, through an open monitoring system that provides trustworthy information, easily accessible to all citizens, about progress on key goals.

A key institutional feature of the energy policy is the commitment to updating it every five years, with the

mechanisms, resources, and processes necessary to ensure that it is politically, socially, and technically legitimate.

For the first time Chile's energy sector can say that it has a state policy built through a participatory process, a policy that provides the long-term orientation the country needs. This will reduce uncertainty not only among investors but also for the entire energy sector. The design of Energy 2050 has transformed the way public policies are formulated. For example, in 2016 when the Ministry of Urbanism and Housing decided to develop a national land planning policy, it designed a process similar to that of Energy 2050, including a strategic environmental assessment, a public-private committee, and national and regional workshops. Other countries—including industrialized nations outside Latin America—also are studying the Chilean experience.

After Energy 2050, several new public actions were launched. For example, a new policy on smart meters was designed to limit electricity outages to four hours annually by 2035. This issue was not publicly discussed before Energy 2050. Other policies were highlighted in previous processes like MAPS to plan for mitigation of and adaptation to climate change through the energy sector. After Energy 2050 included them as goals, both mitigation and adaptation were developed in the following years.

Important national and international validation of Chile's energy policy came in the in-depth review of Energy 2050 published in January 2018 by the International Energy Agency (IEA 2018). In 2009, the IEA had indicated the need for Chile to develop a long-term energy policy, and it saw considerable progress in what the country has accomplished since then, in particular through the Energy 2050 process.

The participatory process has impacted the daily work of the Ministry of Energy and its associated services. The way of working within the ministry changed fundamentally. For the first time it has a strategy to follow and that motivates the ministry

to continue working through short-term vicissitudes. The implementation of Energy 2050 has already started and already has faced challenges. However, the long-term perspective has reaffirmed the ministry's work. For example, in 2016 the Electricity Law included a provision requiring the Ministry of Energy to provide long-term energy scenarios for the next 30 years.

Without a doubt the greatest challenge encountered by Energy 2050 has been the continuity of the policy with the change of government. However, the transition has been successful. During the 2017 presidential campaign, all the candidates stated that they shared the long-term vision of Energy 2050, and that they valued the work done and the consensus achieved in the sector. For this reason, when Piñera (who had been president from 2010 to 2014) was again elected and inaugurated in March 2018, his government's first important directive for the energy sector was to launch a participatory process that would seek contributions from all elements of Chilean society to complement the government's work during the coming four years. Under the new minister, Susana Jiménez, the Ministry of Energy published *Ruta energética 2018–2022: Liderando la modernización con sello ciudadano* (Energy Roadmap 2018–22: Leading Modernization with a Social Seal [of Approval]). This document is based on the government program, the regional workshops, and the contributions from energy stakeholders

under the framework of Energy 2050. Specifically, *Ruta energética 2018–2022* underscores the state's long-term approach to modernization by including among its actions the 2019–20 update of the national energy policy to 2050. The report announces the ministry's intention to undertake its first five-year update in a participatory manner and to include strategic environmental assessment.

Energy 2050 is more than a document with the agreed actions and goals for the energy sector. It has been a participatory process of designing and preparing a long-term energy policy validated over time. Long-term energy and climate change policies take time to formulate and develop. They are continuous processes that should be revisited and whose success depends on stakeholders' commitment, institutional leadership, and access to quality resources and information.

This case study shows that it is possible to have a long-term energy policy in a developing country, with clear goals for sustainability, without neglecting the short-term issues, and at the same time to consider actions to respond to climate change. The design of Energy 2050 was a unique and strategic opportunity to integrate climate change into the development of Chile's energy future. Incorporating an analysis of mitigation and adaptation objectives has generated new perspectives on these impacts and on the social, environmental, and economic benefits of considering them.

ENDNOTES

1. These difficulties are described in Bustos et al. (2018), on which this case study is partly based.
2. It is important to mention that after CADE presented its conclusions, the Ministry of Energy published a national energy strategy for 2012–30, which proposed some initiatives that were included in Energy 2050. However, this strategy did not become the energy policy reference due to a lack of consensus in the sector, as was evident in the CADE and CCTP reports.
3. In 2010, the International Energy Agency suggested the development of a long-term energy policy through a participatory process that included public consultation mechanisms.
4. For more information on this project and the associated social conflict, see Environmental Justice Atlas (2015).
5. Ministry of Energy, Ministry of Environment, Ministry of Transportation, Ministry of Mining, Ministry of Urbanism and Housing, Ministry of Public Lands, Industry Development Agency (CORFO), Electricity Distributors, Natural Gas Distributors, Power Generators Association, Renewable Energies Association, Mining Council, Workers Union (CUT), Consumers Association (ODECU), civil society representative, National Corporation for Indigenous Development (CONADI), Fundación Avina, Fundación Chile XXI, World Wildlife Fund, Natural Resources Defense Council, and seven academics from universities of different regions of the country.
6. Among the actions and goals that Energy 2050 included from these previous documents are interconnection of the two main electric systems (SIC and SING), changes in transmission regulation, reduction of barriers for nonconventional renewables, constitution of an independent system operator for the electric system, legislation for energy efficiency, a more active role for the government in energy policy, and regulation of the use of biomass.
7. It is relevant to mention that according to the Climate Action Tracker, with currently implemented policies, Chile is not likely to achieve its Nationally Determined Contribution (NDC) Paris Agreement targets, which the same Climate Action Tracker rate as “Highly Insufficient”. <https://climateactiontracker.org/countries/chile/>
8. For more information on Chile’s energy mitigation plan, see Ministerio de Energía 2017a.
9. For more information, see the latest report on Energy 2050, Ministerio de Energía 2017b.

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World Resources Institute and the United Nations Development Programme, working closely with UN Climate Change, are developing a set of resources to help policymakers integrate long-term climate strategies into national policy making.



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