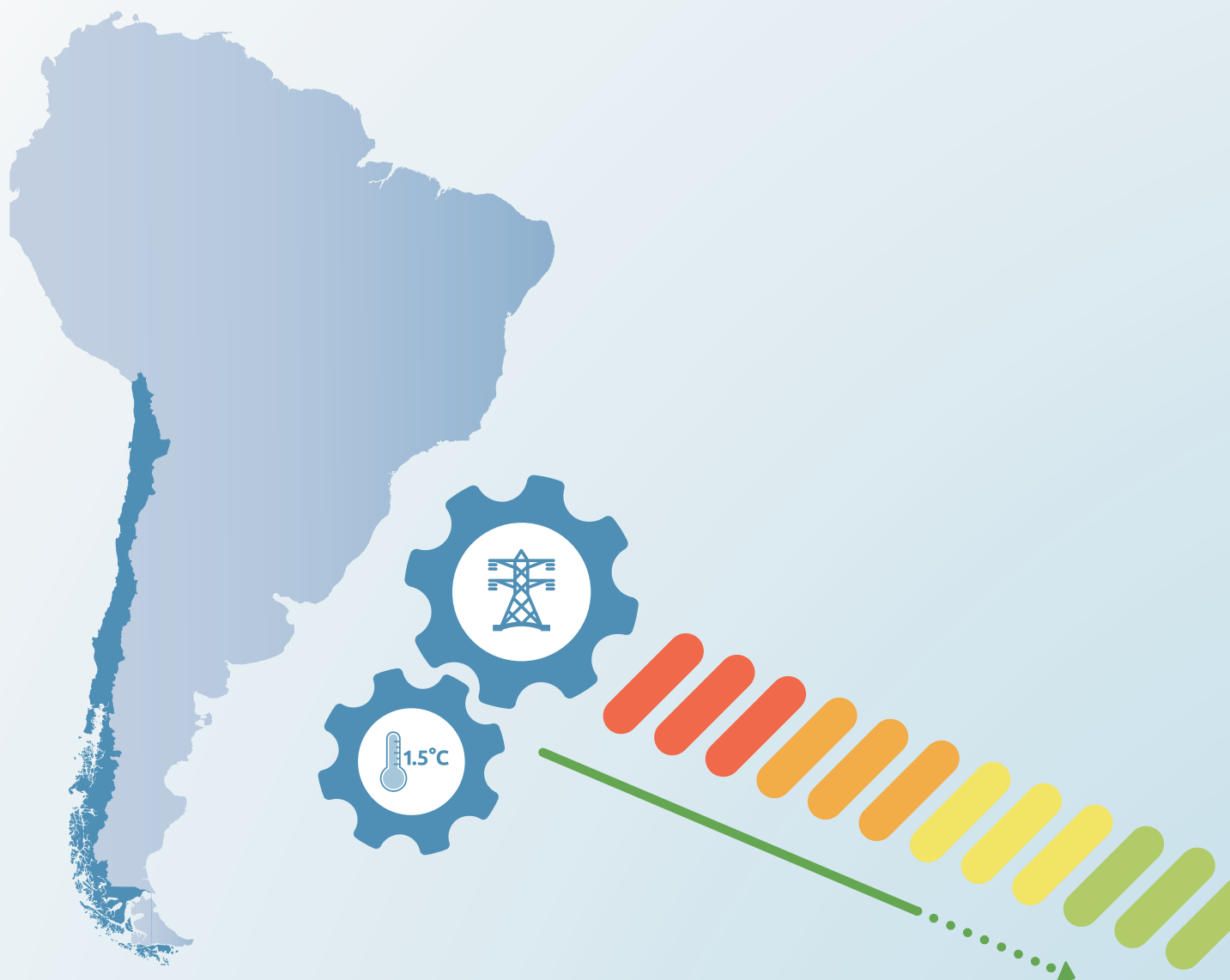




Climate Action Tracker

Chile's power shift

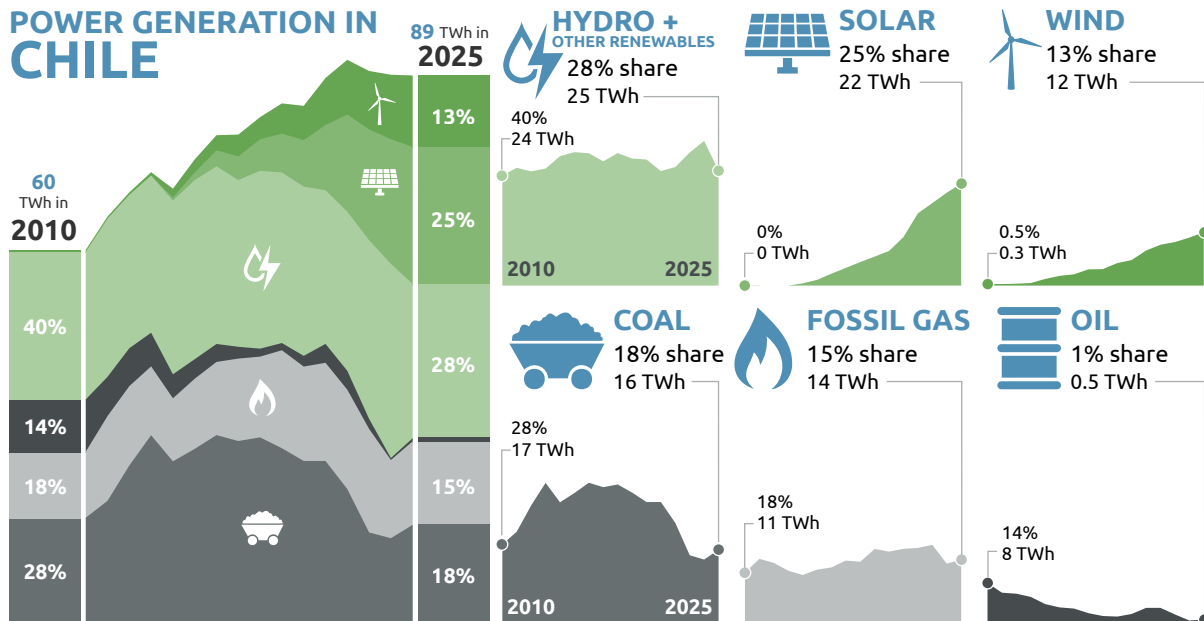
Lessons from a decade of power sector transformation

August 2026



Executive Summary

POWER GENERATION IN CHILE



Chile has transformed its power sector in just over a decade, demonstrating that large-scale renewable energy deployment is not only feasible, but can outpace expectations when supported by a strong and predictable policy framework, tied to procurement mechanisms and clear long-term decarbonisation signals, combined with some of the world's best solar and wind resources.

Chile's experience also demonstrates that if new generation capacity is **not matched with equivalent progress on grid expansion, transmission planning and storage development**, it can produce several imbalances such as grid congestion, high rates of renewable curtailment and inefficiencies in electricity generation and consumption.

Fossil fuel phase-out remains a work in progress. While coal generation has declined faster than anticipated, remaining plants without a phase-out commitment year are not obliged to stop operating until 2040. The growing role of fossil gas as a transition fuel, including plans to retrofit coal plants for fossil gas use, introduces risks of long-term carbon lock-in and continued dependence on imported fossil fuels.

Chile's far-right government led by Jose Antonio Kast has not questioned the role of renewable energy in Chile's power sector. Instead, the emphasis has shifted from climate policy to a more market-oriented approach. Because of the low costs and the advanced state of the transition, renewable energy expansion remains economically and strategically important for the government. Solar and wind generation are among the lowest-cost sources of electricity and, even when combined with battery storage, are increasingly competitive against fossil sources.

Advanced power sector decarbonisation combined with the current positive economic case of renewables makes the **transition resilient to a change in government**. What we see here for Chile could also be the case for other countries in the future.

Since taking office in January, **Chile's new government has released its 2026–2030 Energy Roadmap. The strategy emphasises energy security, system resilience and affordability** alongside the continuation of Chile's energy transition. While it reaffirms the country's commitment to renewable energy and decarbonisation, it also proposes strengthening regional fossil gas integration and fossil gas infrastructure to support supply security. How this strategy will be translated into specific policies and actions remains yet unclear.

Continued reliance on fossil gas as a claimed "transition fuel" risks delaying emissions reductions and can entrench structural dependency on fossil fuels within Chile's electricity mix, creating infrastructure lock-in and stranded assets, a challenge further compounded by the reliance on imported gas.

The recent global energy crisis has reinforced the strategic importance of domestic renewable energy development in reducing exposure to volatile international fossil fuel markets. Chile has been comparatively less affected, largely due to its relatively high share of renewable energy. However, future supply or price disruptions could still occur. Further expanding Chile's renewable energy capacity can help reduce its vulnerability to these risks and strengthen long-term energy security.

Chile's power sector is now entering a new phase of the transition. Increased shares of variable renewable energy (VRE) sources require special attention to system stability and flexibility solutions across multiple timescales. Addressing these challenges is not only essential for the secure operation of the power system, but also for maximising the benefits associated with future large-scale deployment of wind and solar generation. Maintaining this momentum will be increasingly important as electricity demand is expected to grow significantly due to the electrification of transport, industry and buildings, as well as continued economic and industrial development.



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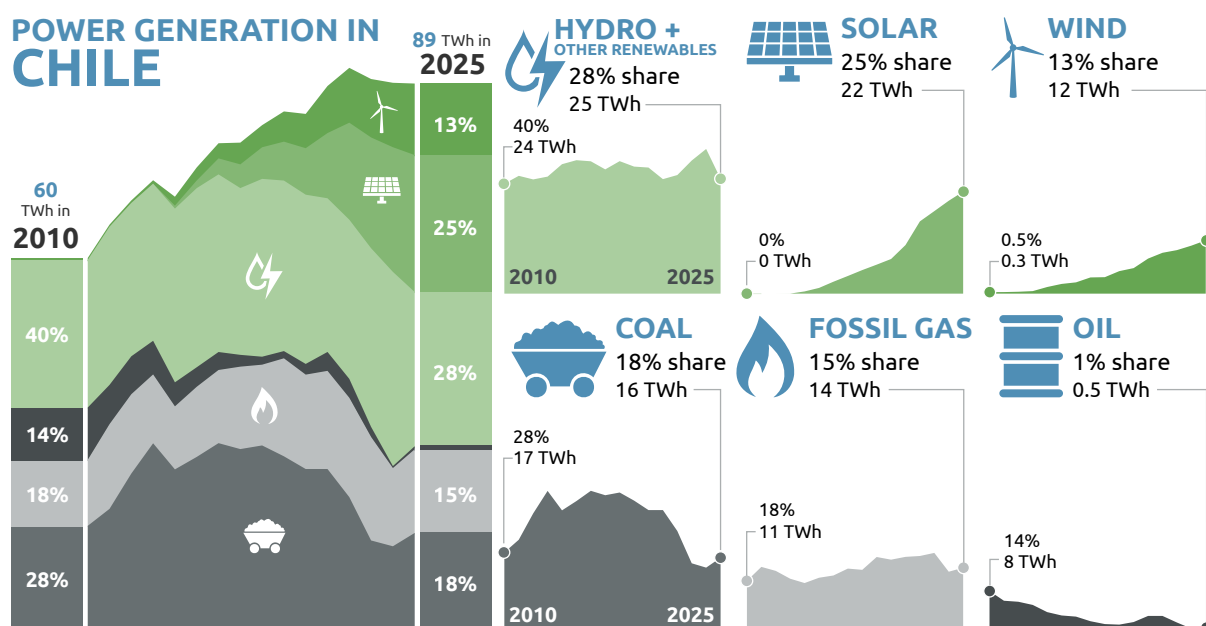


Figure 1 Power generation and share of different sources in the Chilean power sector. Evolution is shown from 2010 until 2025.

Wind and solar growth have transformed the power mix

Chile has transformed its power system in just over a decade, moving from less than 1% wind and solar generation in 2013 to over 38% in 2025 (Ember, 2026a). Renewables now provide around 70% of total electricity, with wind and solar generation surpassing coal for the first time in 2022, marking a significant structural shift in Chile's power mix.

Hydropower has historically played a large role in Chile's electricity mix. However, its share has declined to around 20–30% in recent years, and hydropower output has been increasingly variable due to prolonged drought conditions (Bagnoli et al., 2025). Between 2024 and 2025, hydropower's share in electricity generation dropped by 7% (Ember, 2026a). This was partly compensated for by new solar capacity, but it also resulted in slightly higher fossil gas and coal generation, highlighting a continued reliance on gas and coal during periods of low renewable output.

Looking ahead, electricity demand in Chile is expected to grow considerably in the coming years, driven by continued industrial development and the progressive electrification of the transport, heating and mining sectors. This puts additional pressure on Chile to expand variable renewable energy (VRE) capacity while ensuring system stability and flexibility (IEA, 2026).

Coal phase-out progress highlights the need for flexibility

Chile's coal phase-out is guided by a 2019 public-private agreement between the government and owners of coal assets, which committed to retire or retrofit all coal-fired plants by 2040 ([Gobierno de Chile, 2019](#)).

Notably, this occurred while new coal capacity was still being commissioned, with the Mejillones plant entering operation the same year. Progress to date has outpaced the original phase-out schedule, with several coal units retiring or converting ahead of their agreed timelines. Coal's share in electricity generation has been halved since 2018, declining from 37% to 18% in 2025 ([Ember, 2026a](#)).

Around 2.4 GW of coal capacity has been retired since 2019, with a further 1.5 GW planned for retirement in 2026. However, the remaining coal plants, representing 1.6 GW of coal capacity, do not have concrete retirement commitments and are not obliged to stop operating before 2040 ([Global Energy Monitor, 2026](#)), and 380 MW of the available coal capacity is expected to be retrofitted using fossil gas ([Chile Sustentable, 2022](#)).

The operational inflexibility of coal plants limits their ability to efficiently complement high shares of VRE, contributing to curtailment and system inefficiencies ([Ember, 2026b](#)). As the role of coal further declines, Chile will need to replace the capacity and system services provided by remaining coal assets. The key question is whether this role will be filled by cleaner solutions, or by an increased reliance on fossil gas.

Evolving role of fossil gas: lock-in risk

Chile has not set a phase-out year for fossil gas. As Chile's coal phase-out progresses, energy planning documents from the previous government suggest that gas-fired generation may increase in the short term ([Ministerio de Energía, 2025](#)). This is particularly driven by the conversion of some coal plants to operate with fossil gas rather than fully retire.

At the same time, Chile's reliance on imported fossil gas raises energy security considerations. Chile produces less than 20% of its total gas supply and is heavily dependent on imports, primarily from Argentina ([IEA, 2026](#)). Although Chile's gas supply has remained relatively stable, supply constraints and infrastructure limitations in Argentina have affected Chile's gas flows several times in the past and could expose Chile to supply disruptions in the future ([Reuters, 2025](#)). Argentina's shale gas production is also associated with relatively high methane emissions, raising climate concerns and further undermining its claimed role as a "transition fuel" ([IEA, 2025](#)).

Fossil gas expansion carries longer-term risks for Chile's electricity mix. Repurposing coal assets for fossil gas use or investing in additional flexible gas-fired capacity could lock in emissions, create stranded assets, and delay investment in cleaner flexibility solutions.

Chile's rapid increase in wind and solar power and declining share of coal in electricity generation can be primarily attributed to its strong policy framework, which created favourable market conditions for the installation of new wind and solar capacity.

Chile's advantageous geographical location, with some of the world's best solar resources – particularly in the Atacama Desert (Cordero et al., 2023) – and strong wind potential (Global Wind Atlas, 2025), as well as the global decline in installation costs for solar and wind technologies, have further improved the competitiveness of renewables relative to fossil fuel-based generation and supported the transition (IRENA, 2024).

In the case of Chile, its ambitious targets, predictable implementation timelines and procurement mechanisms guaranteed a market for renewable energy, and clear long-term decarbonisation signals were key in scaling solar and wind (Centro Estudios Financieros, 2025).

Policies driving action Key elements of Chile's energy policy framework

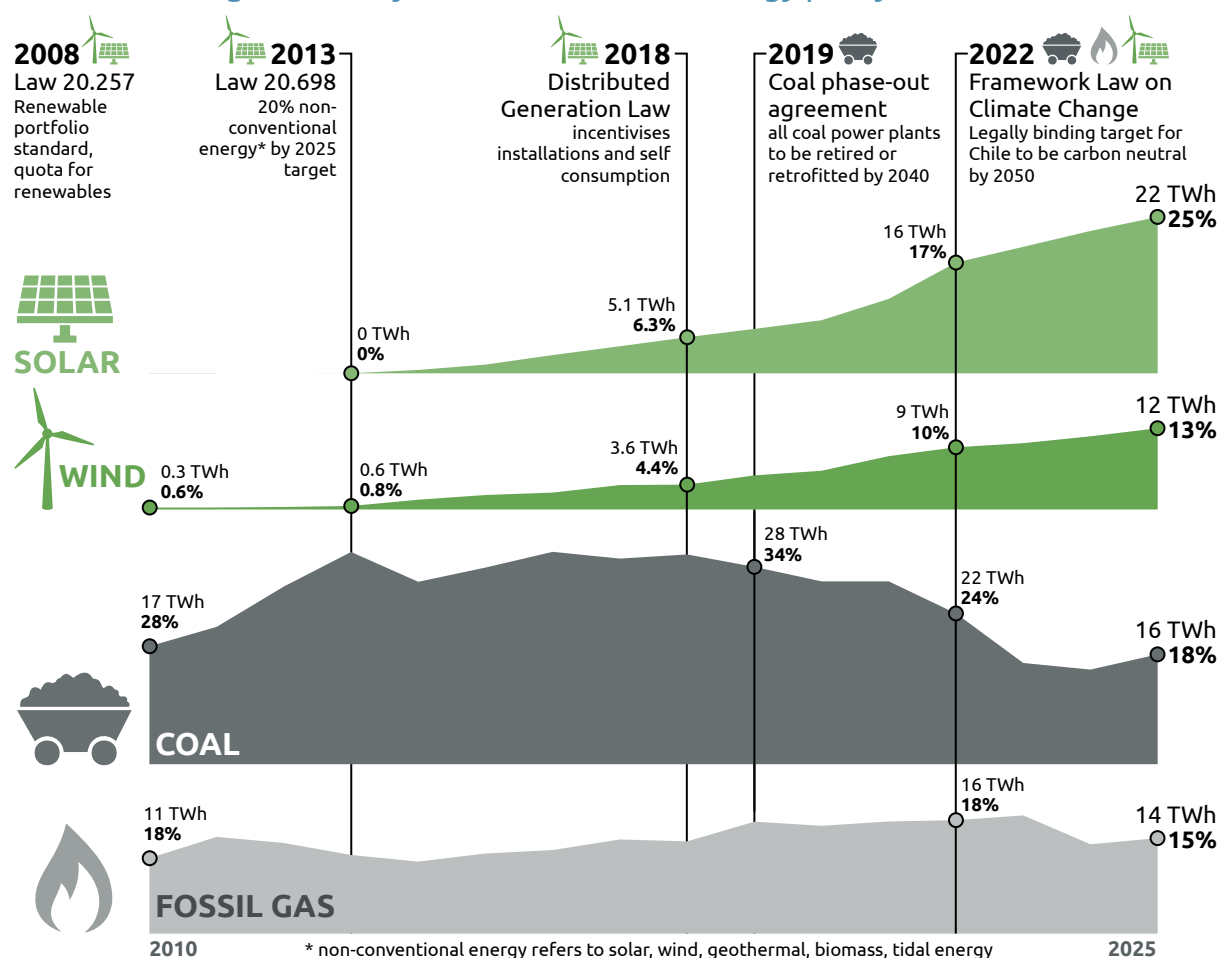


Figure 2 Policy framework impact on electricity production and shares of renewables and fossil sources

Clear policy signals provided the foundation for renewables expansion

Chile's renewable energy policies created a legally supported foundation for renewables growth early on. In 2008, Chile enacted Law 20.257 on Non-Conventional Renewable Energy ([Gobierno de Chile, 2008](#)). This legislation introduced a renewable portfolio standard (RPS), requiring electricity companies to source a minimum share of their supply from non-conventional energy sources (NCES)¹, creating an early and legally binding demand for renewables in the electricity market.

Demand certainty and market access helped make renewable targets actionable

The 2013 reform of Chile's renewable energy framework marked a turning point in the country's wind and solar energy development. Law 20.698 strengthened the earlier RPS and established a target for a 20% share of electricity generation from non-conventional energy sources by 2025 ([Gobierno de Chile, 2013](#)).

Crucially, it also required the Ministry of Energy to organise public tenders to enhance the share of NCES in Chile's electricity supply. By providing long-term price certainty and fostering competition while driving down costs, these auctions became a central instrument for scaling up renewables deployment.

Chile also introduced policies to support decentralised renewable generation through reforms to its Distributed Generation (or "Net Billing") Law in 2018, which improved conditions for renewable self-consumption projects connected to the grid by streamlining grid integration and permitting processes. By 2025, self-consumption photovoltaic systems exceeded 300 MW of installed capacity ([Electrominera, 2025](#)). While modest in overall scale, these reforms supported broader participation in the renewable energy transition and extended the benefits of clean electricity generation beyond utility-scale projects.

Long-term decarbonisation signals reinforced the shift away from coal

Beyond policies that directly support renewables growth, Chile's long-term policy framework further drove the transition. An important milestone was the 2019 public-private agreement to retire or retrofit all coal-fired plants by 2040 ([Gobierno de Chile, 2019](#)). Although the agreement is voluntary, it provided a clear signal to investors and utilities that coal would play a declining role in the electricity mix. Several units have since retired or converted ahead of their original timeline, reflecting both the policy direction and growing competitiveness of renewable energy technologies.

Chile's landmark 2022 Framework Law on Climate Change (Ley Marco de Cambio Climático) further strengthened this long-term direction. It established a legally binding carbon neutrality target for 2050 and formalised sectoral mitigation and adaptation planning obligations for Chile's different ministries, significantly strengthening institutional coordination and cross-sectoral governance for climate policy and NDC implementation ([Gobierno de Chile, 2022](#)).

For the electricity sector, the Energy Sector Mitigation Plan outlines specific measures to support the transition and for Chile to meet the power sector emissions level and budget set out in its NDC ([Gobierno de Chile, 2024](#)).

Rapid deployment must be matched with system integration

The development of wind and solar energy in Chile offers important lessons for system integration. Policy and investment efforts focused largely on the deployment of new generation capacity, while comparatively less attention was given to grid expansion, transmission planning and storage development. This imbalance has contributed to several challenges now facing the Chilean power system, including grid congestion, renewable curtailment and high electricity price differences between generation areas and major demand centres ([Centro Estudios Financieros, 2025](#); [Ember, 2025](#)).

¹ Biomass, geothermal, solar, wind and tidal energy ([Gobierno de Chile, 2018](#))

Chile's future power sector transition will be shaped by both the legacy of the previous government and by the new government that took office in November 2025, led by President José Antonio Kast. The new government will define the pace and direction of implementation through 2030 and the future.

The Kast administration has not questioned the role of renewable energy in Chile's power sector, because of the low costs and the advanced state of the transition. The case of Chile shows that advanced power sector decarbonisation combined with the current positive economic case of renewables makes the transition resilient to a change in government. What we see here for Chile could also be the case for other countries in the future.

But the political discourse in Chile has shifted from climate policy towards energy security, affordability and economic development. This position is reflected in the 2026–2030 Energy Roadmap ([Gobierno de Chile, 2026](#)), which emphasises the energy transition as a driver of economic growth, reduced dependence on external suppliers and new investment opportunities. At the same time, the roadmap and government actions highlight the role of fossil gas to support energy security and the transition. How these strategic priorities will be translated into specific policies and regulatory measures remains still uncertain.

Continued reliance on fossil gas as a so-called "transition fuel", presents an important challenge for Chile's decarbonisation. Expanding gas infrastructure and increasing dependence on fossil gas could create carbon lock-in, prolonged reliance on imported fuels and delay emissions reductions.

Furthermore, the new market-oriented approach to the transition of the new government raises risks that need further consideration. Accelerating investment and streamlining project development can support renewable deployment, but these need to be supported with robust environmental safeguards, meaningful engagement with indigenous peoples and local communities and the protection of citizens' rights. These dimensions are fundamental to ensuring a fair and durable power sector transition ([Fundacion Chile Sustentable, 2026](#)).

Chile's renewable future – integration as a driver of expansion

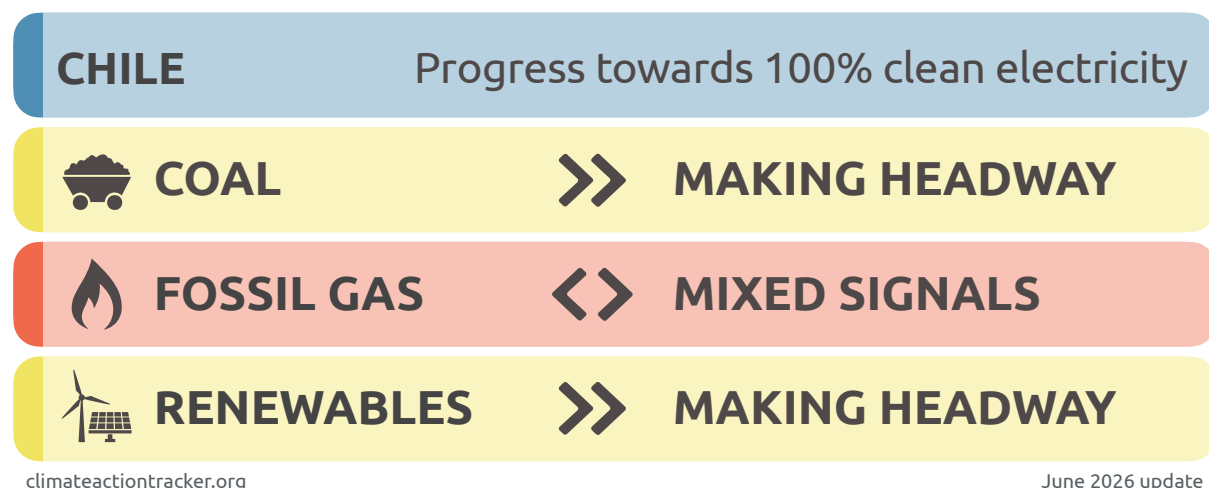


Figure 3 Power sector decarbonisation evaluation for Chile using the Climate Action Tracker methodology (Climate Action Tracker, 2025)

In 2022, the previous government published the country's updated Energy Strategy (also known as PEN - *Política Energética Nacional*). The document set a target of 80% renewable electricity generation by 2030 and a 100% "zero-emission" energy system by 2050 ([Ministerio de Energía, 2022](#)). In 2025, the same government published an updated decarbonisation plan, outlining measures to support renewables deployment via market-driven policy incentives, renewables auctions, and further battery storage development ([Ministerio de Energía, 2025](#)).

The energy strategy released by the Kast government reaffirms the 80% renewable electricity generation target for 2030 and introduced a new milestone of achieving up to 100% peak renewable generation in the national electricity system ([Gobierno de Chile, 2026](#)).

While maintaining support for renewables expansion, the new strategy places a greater emphasis on the challenges associated with a higher share of VRE sources in the system. To address these challenges, the strategy proposes several solutions such as expansion of transmission infrastructure, reforms of the electricity market to better reflect a system dominated by VRE sources and storage, and measures to strengthen system reliability and flexibility.

Coal phase-out and fossil gas – uncertainty and mixed signals

Coal phase-out

The national commitment agreed in 2019 to retire or retrofit all coal-fired plants by 2040 remains the central policy framework guiding the phase-out of coal in Chile's power sector. The previous government's updated Decarbonisation Plan explored the possibility of advancing the coal phase-out date, potentially to around 2035, subject to sufficient renewables integration and system reliability ([Ministerio de Energía, 2025](#)).

The energy plan from the Kast government doesn't reiterate the possibility of advancing the coal phase-out timeline. Instead, it focuses on the challenges that a full coal-phase out represents for system stability in the future. The plan emphasises the objective of retrofitting coal plants, without clearly specifying the energy source that will be used ([Gobierno de Chile, 2026](#)).

Fossil gas may expand in the short-term, but long-term risks remain

The previous government's Decarbonisation Plan acknowledged a potential short-term increase in fossil gas use, due to the conversion of some of the coal plants into gas-fired generation units. At the same time, it highlights the need to limit long-term gas lock-in by prioritising investments in renewable energy generation and flexibility technologies ([Ministerio de Energía, 2025](#)).

In line with this approach, Chile's prior government introduced compatibility criteria under the Framework Law on Climate Change, requiring public and private investments to align with Chile's climate targets and demonstrate a credible strategy for future decarbonisation or reconversion to green technologies.

However, the future implementation of these criteria remains uncertain following the change in government. The energy strategy document published by the Kast administration emphasises the key role that fossil gas will play in ensuring energy security and system reliability. The document identifies specific measures to improve current supply systems, specifically integration with Argentina's drilling sites, targeting supply deals and infrastructure ([Gobierno de Chile, 2026](#)).

The future importance that the current government gives to fossil gas is further supported by Chile's Energy Minister Ximena Rincon's visit to the Vaca Muerta shale gas extraction site in Argentina in June 2026. During this visit, the minister emphasised the government's objective of securing more stable and long-term fossil gas supply contracts from the region ([Gobierno de Chile, 2026](#)).

Towards the next phase of the transition and phased-out fossil fuels in the power sector

Despite Chile's strong progress and relatively ambitious targets, a pathway consistent with limiting global warming to 1.5°C requires even faster decarbonisation.

More broadly, this reflects a global challenge, as current collective efforts are still falling short of alignment with the Paris Agreement. According to the Climate Action Tracker (CAT) power sector benchmarks, achieving such alignment for Chile would require complete decarbonisation of the power sector by 2035 ([CAT, 2023](#)). Chile could build on the current phase-out framework for coal and advance it from 2040 to 2035. It would also benefit from a clear strategy to phase-out fossil gas, building on the previous experience acquired with coal planning.

The first phase of Chile's energy transition was driven by its rapid renewables development, while this next phase will be defined by how effectively Chile can integrate high shares of VRE while maintaining system stability, flexibility, affordability, energy security and fossil fuel phase-out.

As renewable capacity continues to expand, the policy focus needs to shift towards transmission, storage, and other flexibility solutions needed to integrate Chile's high shares of VRE into its electricity system. The energy transition in Chile still needs to focus on some of the previous government's priorities such as just transitions ([Gobierno de Chile, 2021](#)) and high standards for environmental protection ([Chile Sustentable, 2026](#)).

The energy crisis triggered by the US-Israel war on Iran highlighted the vulnerabilities that countries reliant on fossil fuel imports face, with fossil energy sources being susceptible to price volatility and supply disruptions. Chile has experienced past fossil gas supply disruptions from Argentina that severely impacted the sectors that were more reliant on it as an energy source ([Reuters, 2025](#)).

Continued reliance on fossil gas as a so-called "transition fuel" risks delaying emissions reductions and can entrench structural dependencies on fossil fuels within Chile's electricity mix, a challenge further compounded by the reliance on imported gas. For a country like Chile, reinforcing the strategic value of domestic renewable energy development is key. This highlights the need to move beyond fossil gas and prioritise investment in readily available non-fossil options. Fossil gas is still a fossil fuel and needs to be phased out as coal.

Key existing and future challenges

Chile already ranks among the countries with the highest penetration of VRE worldwide (IEA, 2024). The country's unique geography, stretching 4,300 km from North to South, results in significant renewables potential. However, the most resource-rich areas in the North and South are also relatively far from major electricity demand areas in the centre of Chile, posing considerable challenges for the transmission and storage capacity of renewable electricity.

These structural and transmission constraints result in high levels of congestion and limit the availability of energy storage resources in the system. This leads to curtailment, where available electricity cannot be delivered to the grid or used, thereby limiting the effective utilisation of renewable electricity (ESE, 2025; Ember, 2025). In 2024, wind and solar accounted for 34% of electricity generated, but, without curtailment, this could have reached up to 41%, highlighting the growing importance of sufficient transmission capacity and system flexibility (Ember, 2026b).

Variability in traditional power systems is driven mainly by demand. In the future, systems with higher shares of wind and solar technologies like Chile's, will also face weather variability, creating a range of technical and operational challenges that must be addressed to ensure reliable and efficient integration of VRE.

Increased shares of VRE sources require paying special attention to system stability and flexibility solutions across multiple timescales. Addressing these challenges is not only essential for the secure operation of the power system, but also for maximising the benefits associated with large-scale deployment of wind and solar generation (IEA, 2024; De Vivero, 2018).

Consequently, Chile must address both current operational challenges and future system requirements. This dual challenge highlights the need for coordinated planning and policy measures that enhance short-term system performance while enabling a reliable and flexible transition toward a fully renewable electricity system.

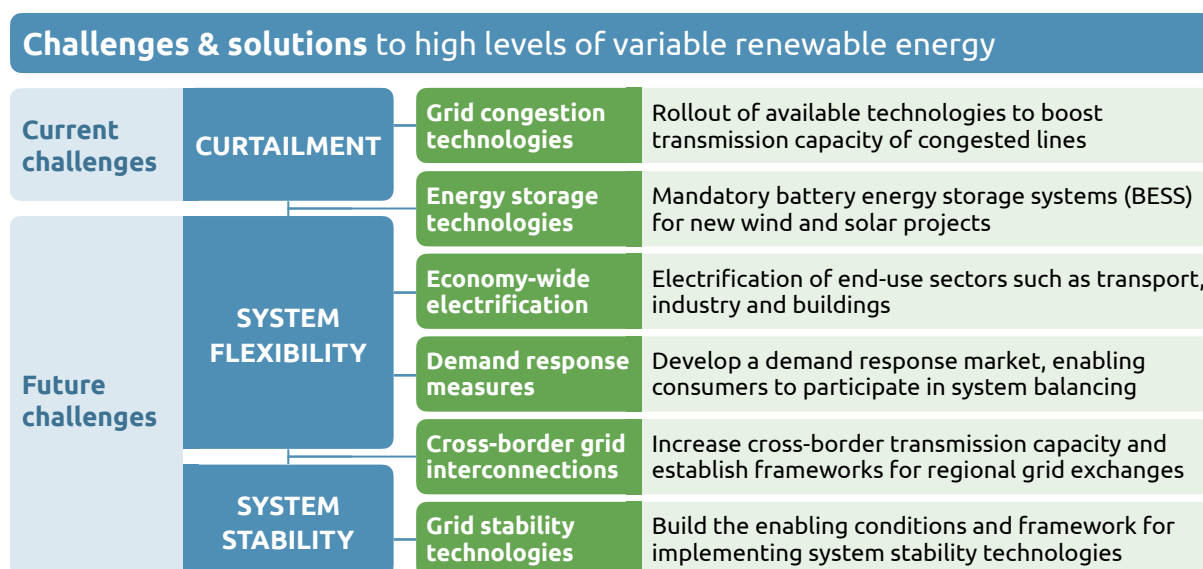


Figure 4 Current and future challenges for Chile's power sector under high penetration of VRE and available solutions to mitigate them

Policy direction to tackle these challenges

Chile's power sector transition highlights that strong policies can accelerate renewables expansion and coal decline, but this growth must be matched by early investments in the infrastructure, storage, and flexibility needed to integrate high shares of renewable energy into the power system while phasing out fossil fuels.

Curtailment

Mitigating high levels of curtailment would require decreasing the transmission congestion and increasing flexibility resources available in the system. Technologies to alleviate over-congested lines are already available and could be implemented as a short-term solution for those lines that are experiencing high levels of congestion (Ember, 2025).

System flexibility can be increased through mandatory battery energy storage system (BESS) requirements for new wind and solar projects, which are becoming increasingly competitive (IRENA, 2026), and by developing the enabling conditions needed for expanding battery capacity across the system (Ember, 2025). Chile is already experiencing a considerable increase in battery deployment, with enough theoretical storage capacity installed in 2025 to shift an amount of electricity equivalent to 76% of the solar generation added that year. (Ember, 2026). This enables solar electricity produced during daylight hours to be used at other times of the day.

System flexibility

With higher penetration and dependence on VRE sources, flexibility needs will progressively increase, moving from seconds and days to months (IEA, 2024). Deployment of technological solutions, such as BESS, can be complemented with demand response measures.

Developing a demand response market and establishing rules for consumers to actively contribute to system balancing measures, is essential and a critical short-term flexibility provider (IEA, 2024). Research and innovation is still required to solve some key issues such as seasonal variability, which will require efforts from both policymakers and researchers worldwide (IEA, 2024).

The electrification of end-use sectors such as transport, industry and buildings, could be coupled with demand response measures to further increase the capacity of the system for demand-side flexibility. This would allow utilising the full capacity of clean power generation in the country to achieve higher shares of VRE in the future and since more electricity will be used, increasing energy efficiency of the overall system.

Chile's power system remains weakly interconnected with neighbouring countries (IEA, 2024), limiting opportunities for regional electricity exchange and therefore limiting flexibility. Expanding cross-border interconnections could enhance both flexibility and system stability. Establishing a clear and coordinated regulatory framework to support the development of these interconnections with Peru and improve current exchanges with Argentina, would be key to further address these challenges (Ember, 2025).

System stability

Most of the tools needed to ensure system stability are already commercially available and technically mature, and key barriers to successful large-scale integration of VRE sources in the system are therefore not technological but rather lie in appropriate policy and regulatory action (IEA, 2024).

Regulatory frameworks could emphasise the efficiency dimension, prioritising those solutions that could give several different services at the same time such as synchronous condensers, which can play an important role in maintaining inertia and voltage stability (ISCI, 2024). The Chilean electricity coordinator is already planning to develop and install available technical solutions (Strategic energy, 2025).

The table below covers how the above-mentioned challenges are covered by current laws and plans from the Kast government.

Table 1 Policy and planning instruments from the current and previous government addressing current and future challenges for the decarbonisation of the Chilean power sector

Challenge	Instrument	Type of instrument	Description of the law
Curtailement & Flexibility	Ley 21.505 (2022)	Law	Enables energy storage as a market participant, including stand-alone storage
Curtailement, Flexibility & stability	Proceso de planificación de la transmisión (2026)	Planning instrument	Annual updated plan on new transmission line development based on projected demand for electricity
Flexibility & curtailement	Planificación Energética a Largo Plazo 2028–2032	Planning instrument	30-year electricity sector outlook, identifying generation, transmission and storage needs
Curtailement, Flexibility & stability	Plan de descarbonización (2025)	Planning instrument	Named second step for the energy transition; it covers relevant aspects such as transmission development, flexibility and stability under high VRE shares
Flexibility & stability	Agenda de Energía 2022–2026	Planning instrument	Operation roadmap across eight axes, highlighting transmission planning, infrastructure and technologies for higher shares of renewables and storage promotion and system modernisation
Stability	CNE Plan Normativo 2025	Planning instrument	Annual regulatory plan from the national regulator of electricity markets, prioritising technical solutions to improve system stability
Curtailement, Flexibility & Stability	Energy Transition Law (2024)	Law	Intermediate step towards Chile's decarbonisation objectives and carbon neutrality goal. It aims to accelerate the development of transmission projects through streamlined permitting, improved electricity system planning, enabling the buildout of key infrastructure, and encouraging energy storage expansion
Curtailement, Flexibility & Stability	Ruta Energética 2026–2030	Planning instrument	New government strategy defining six priority axes to accelerate and strengthen Chile's energy transition, emphasising energy security and competitiveness



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CAT Consortium



The Climate Action Tracker (CAT) is an independent scientific project that has been tracking climate action since 2009. We track progress towards the globally agreed aim of holding warming well below 2°C, and pursuing efforts to limit warming to 1.5°C.

climateactiontracker.org



NewClimate Institute is an independent non-profit organisation that develops solutions to tackle climate change and drives their implementation worldwide. Through research, policy advice and knowledge sharing, we aim to raise the ambition for climate action and support sustainable development.

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Climate Analytics is a non-profit institute leading research on climate science and policy in relation to the 1.5°C limit in the Paris Agreement. It has offices in Germany, the United States, Togo, Australia, Nepal and Trinidad and Tobago.

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Institute for Essential Services Reform (IESR) is an energy and environment focused think-tank that aims to accelerate the energy transition by supporting sustainable mobility, green economy, and well designed climate change policy. IESR has experience mainly in Indonesia, but is expanding its focus to work in other regions and countries.

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