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Policy failures and energy transitions: the regulatory bricolage for the promotion of renewable energy in Mexico and Chile

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Latin American and Caribbean countries experience energy transitions in the context of crises affecting power electric systems. This article shows that policy failure recognition constitutes a window of opportunity for regulatory reforms supporting the diffusion of renewable energy. This argument is illustrated with the cases of Mexico and Chile, both of which are regional leaders in renewable energy after policy reforms. In both cases, policy failures were key drivers of energy transition since they mobilised different actors in the pursuit of policy changes. However, policy responses depended on how different policy failures were interpreted as the origins and solutions to perceived energy crises. This study distinguishes between critical and ordinary policy failures. In the case of a critical failure, dominant policy ideas are placed under contest; whereas, in an ordinary policy failure, the normative underpinning of the policy remains valid, and it fails only in implementation. Because policy change in the energy sector is incremental, reactions to failures lead to a policy bricolage combining novel and older policy goals and instruments. This process shifts the balance in the prioritisation of the energy trilemma components (energy equity, security of supply, and environmental sustainability).

npj Climate Action (2023)2:8; <https://doi.org/10.1038/s44168-023-00039-4>

INTRODUCTION

The research on energy transition in Latin American and Caribbean (LAC) countries has grown substantially over the past decade. It has emphasised the proactive role played by the governments of the region in the international climate negotiations¹ underlying the regional potential and barriers to decarbonize energy systems^{2,3}. The literature also studied the local impacts of energy transition policies and its negative effects on indigenous lands leading to the emerging social opposition^{4–7}. In the same vein, social implications of infrastructure projects have been widely discussed⁸, including the cultural implications of dominant worldviews on the energy transition⁹.

Recent energy transition trends follow the traditional use of renewable energy — particularly biomass and hydropower — in LAC countries. Biomass has been used for cooking and heating in communities without access to electricity, although its use is falling due to electrification in rural areas¹⁰. Promoted by governmental investments, hydropower became a central feature of LAC countries' electric power systems in the first half of the twentieth century, after the development of large-scale plants^{2,11}. However, the reliance on hydropower is being challenged by a combination of growing societal resistance and the climate vulnerability of these plants^{12,13}. Recent debates surrounding the challenges of an energy-water-food nexus further undermined the prospects for hydropower¹⁴. For some analyst, therefore, energy transition in the region should involve the diversification of the renewable energy portfolio¹⁵.

Considering energy challenges such as demand growth, climate change, and a weak diversification of energy supplies³, almost all national governments in the region have developed plans to promote renewable energy beyond hydropower¹⁶. As shown in Fig. 1, this has been an increasingly popular option for the installation of new electric power generation capacity¹⁷ (p. 2). Although these figures are mainly driven by hydropower development, Figs. 2 and 3 capture the growth of other sources,

such as wind and solar energy, in the Mexican and Chilean cases. Over the past decade, there has been a structural change in the LAC countries' electric power sector which aimed to attract national and international private investment and incrementing electrification rates¹⁸.

This article contributes to the analysis of factors enabling energy transition in LAC countries. Different contributions pointed out that transitions take place in the context of wider electricity reforms leading to market liberalisation and regulatory reforms^{11,18}. Similarly, Koengkan et al.¹⁹ argued that globalisation is a structural explanatory factor of policy change, while Battle et al.¹¹ focused on the changing role of the state as a driver of reforms. We argue that energy policy failure triggers the regulatory reforms leading to policy bricolage involving the reconsideration of the state's involvement in energy sector.

Drawing on the cases of Mexico and Chile (two energy transition leaders among LAC countries), this article contributes to the literature scrutinising the political factors and mechanisms driving energy policy transition reforms^{20–22}. By adopting a discursive institutionalism approach^{23–25}, we argue that energy policy failures drive policy changes in the regulatory framework leading to the changing role of the state. This is demonstrated by analysing the framing of failures as a response to energy crises. This article illustrates the extent to which policy response depends largely on the differential recognition of policy failures (critical or ordinary). It also shows that energy policy change usually leads to policy bricolage combining new and old policy ideas and instruments²⁶.

Three research gaps are addressed. First, it links the consequences of policy failures with energy transitions. Most of the studies focus on the processes of policy reforms, associated sectoral programs, and specific projects, but there is no specific systemic consideration that these energy policy reforms might be shaped by the framing of policy failures. Second, in this way our research links political debates about energy policy failures with

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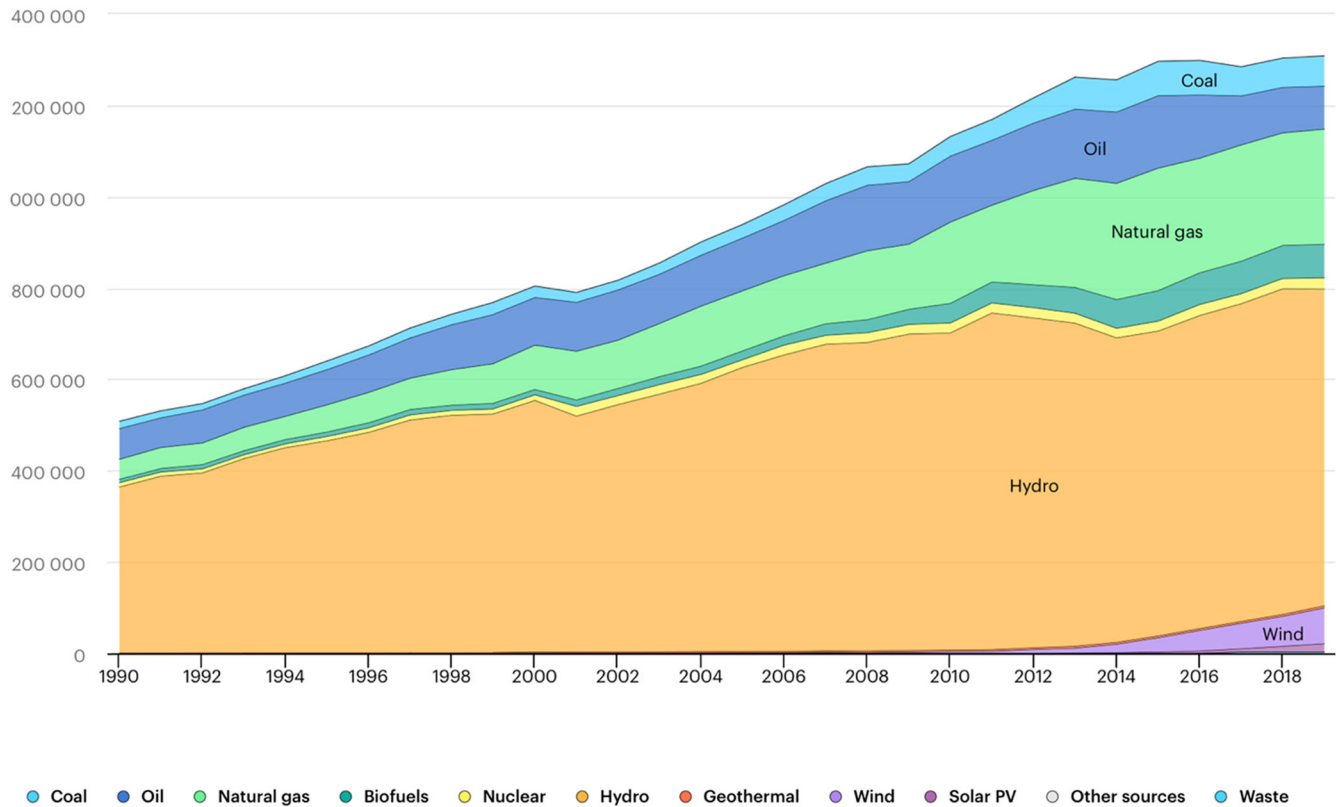


Fig. 1 Electricity generation by source, Central & South America 1990–2019 (GWh). Source: Electricity Information - Data product - IEA.

the research agenda on such policy instruments as renewable energy political commitments, auction systems, green certificates, voluntary or compulsory quotas and targets, and subsidies considered as the drivers of the diffusion of renewable energy technologies in LAC countries¹⁵. Finally, we also contribute to the literature on the shifting role of the state in the energy sector in LAC. Even though energy governance in LAC emphasised state control over natural resources^{27,28}, there is a broad diversity of approaches to balance the roles of private actors and public control¹¹. Our approach suggests that the attribution of responsibilities for policy failure might be a factor shifting the role of the state toward more or less involvement in the energy sector.

To illustrate our contribution, this article analyses the evolutionary and cumulative regulatory policy changes in the electric power sectors in Mexico and Chile. The power sector and its public utilities in Mexico historically was linked to energy nationalism. After several failed attempts, the inclusion of a market approach within the sector came only after successfully framing a creeping energy crisis as a critical policy failure. The collapsed structure of incentives affecting public utilities and originated from the unbalanced liberalisation of the national market triggered the crisis. Policy failure was explained as a matter of state intervention. The framing of policy failure in Mexico emphasised the need to reinforce economic efficiency and energy affordability to strengthen supply security and environmental sustainability. However, this contested process led to a bricolage of policy ideas, where market approaches coexist with older ideas about the public service of electricity and strong governmental participation in the sector. In contrast, Chile represents a case where the recognition of an ordinary policy failure led to a different kind of policy bricolage. In this second case, the introduction and modification of policy tools employed to diffuse renewable energy took place in the context of an increasing recognition of the ordinary policy failures of the existing liberal energy market model which reflected the collapsing incentive

structure for both energy companies and consumers. The emerging bricolage of policy instruments featured an incremental process of regulatory modifications punctuated by few landmark regulatory acts modifying a very liberal market model towards stronger intervention of the state in the sector to enhance energy security supply and sustainability with new policy tools.

The structure of this article is as follows. After this introduction, the paper presents the analytical framework for policy failures and policy bricolage, followed by a brief explanation of the methodology. The empirical cases of Mexico and Chile present energy crises as drivers of policy change, the policy failure frames and the policy bricolage. Finally, we discuss our empirical findings and conclude by considering the future research agenda on the dynamics of policy failures and the resulting policy implications.

AN ANALYTICAL FRAMEWORK FOR ENERGY POLICY FAILURES

Building upon the objective and subjective aspects of failure²⁹ (p. 671), McConnell argues that ‘a policy fails, even if it is successful in some minimal respects, if it does not fundamentally achieve the goals that proponents set out to achieve, and opposition is great and/or support is virtually non-existent’. Energy policy failure exists when policy ‘does not meet local, national, and international energy and climate goals across the activities of the energy life-cycle and where just outcomes are not delivered’³⁰ (p. 4). In the energy field, a crisis illustrates a policy failure when there is ‘a failure to provide industrial societies with the abundance of energy to which its machines and infrastructure have become accustomed’³¹ (p. 312). Such crises might be caused by multiple factors, such as collapsed incentives, lost projects, mistakes, wrong paths, and decisions³⁰ (p. 4). After the initial failure commonly depicted as supply disruption, there is a moment of intervention that involves changes in a given policy to address identified failures³².

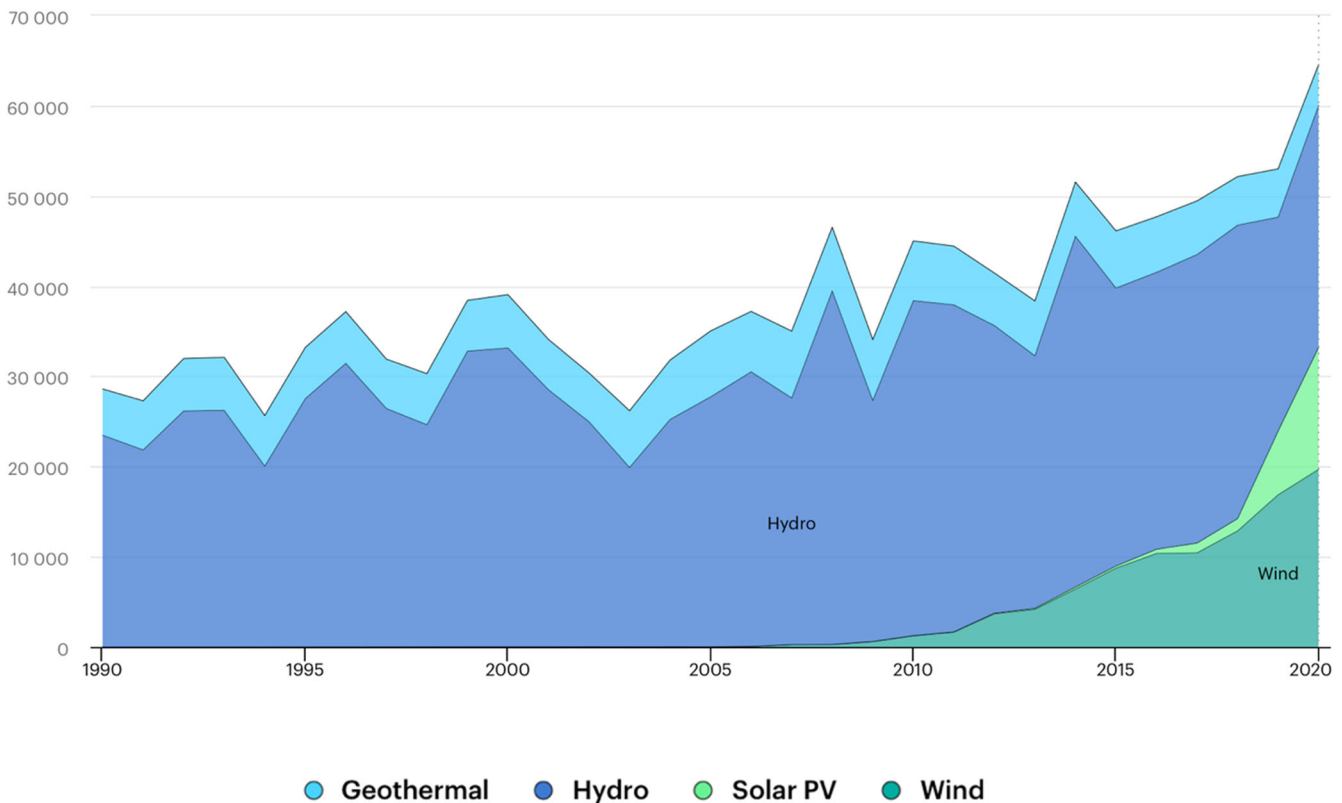


Fig. 2 Renewable electricity generation by source (non-combustible), Mexico 1990–2020 (GWh). Source: Electricity Information - Data product - IEA.

Following the constructivist approach of discursive institutionalism^{23–25}, policy failure is interpreted in narratives during the judgements about events since ‘failure is not inherent in policy events themselves’³³. As argued by McConnell²⁹ (p. 680), ‘framing a policy as “failed” is both a judgement and a move to delegitimise the value and veracity of what government is doing’. Discourse coalitions, as ‘a group of actors who share a social construct’³⁴ (p. 45), play a key role in declaring policy failure. These actors share a discursive ensemble of ideas, concepts, and categories through which meaning is given to a phenomenon. In this way, discourses declaring an energy crisis frame certain phenomena and construct their meanings by describing the actual situation as policy failure and prescribing certain actions to remedy it. This can lead decision-makers to focus on the diverse elements of the energy trilemma: energy security, environmental sustainability, and energy equity³⁵.

The nature of policy failures may be defined in terms of contradictions between different elements of policies — policy ideas and policy instruments, such as sectoral plans, programs, and projects, and achieved results³⁶. Therefore, this paper introduces the novel categorisation distinguishing between energy disruption framed as a critical or ordinary failure of older policy ideas and/or instruments. In critical failure, dominant policy ideas are placed under contest because of the claimed contradiction between policy goals and achieved results. In an ordinary policy failure, the normative underpinning of a given policy remains valid, but its implementation is failing —the contradiction is between policy goals and policy instruments³⁷.

Considering that the judgement on the type of failure is subject to interpretation, what determines the reaction to policy failure is the discursive recognition of the nature of contradictions more than the objective facts. Recognition consists of speech acts, or ‘otherwise symbolic acts that communicate the acknowledgement of the ontological, legal, and moral status of certain objects and subjects’³⁸

(p. 110). While policy discourse includes descriptive statements about the nature of failure, they might also involve prescriptive statements embracing novel policy ideas and/or instruments leading to policy change³⁹. Even though policy change as ‘the description and explanation of changes in dominant policy patterns in different fields’ is the core interest of public analysis, there are different conceptualisations and measurements of this dependent variable⁴⁰ (p. 251). Nevertheless, to measure more accurately the scope and direction of policy change we focus on the policy density in the process of energy policy bricolage⁴⁰ (p. 260–263).

As refers policy density, we consider the extent of the expansion of policy goals and instruments covering new policy areas regarding renewable energy through the governmental intervention in the energy sector. We expect that policy failure will lead to incremental energy policy bricolage⁴¹, which is the addition or layering of novel policy elements to the older policy elements^{42–44}. Depending on whether a failure is recognised as critical or ordinary, it will lead to different types of policy bricolage. We can expect that the recognition of critical policy failure exposing the contradiction between policy ideas and achieved results will lead to the bricolage of older and novel policy ideas and goals. At the same time, the recognition of ordinary policy failure exposing the contradictions between policy ideas and instruments will lead mostly to the bricolage of employed policy instruments.

Policy bricolage will occur within the framework of the energy trilemma to balance the three competing aims of energy security, environmental sustainability, and energy equity (affordability and accessibility), which constitute the core of energy policy ideas and instruments^{45,46}. Policy failure to trigger energy transition should involve the inclusion or recalibration of new policy goals. Policy change might involve displacement between different priorities without completely renouncing any of them. This occurs, for example, when the energy security priority is rebalanced in

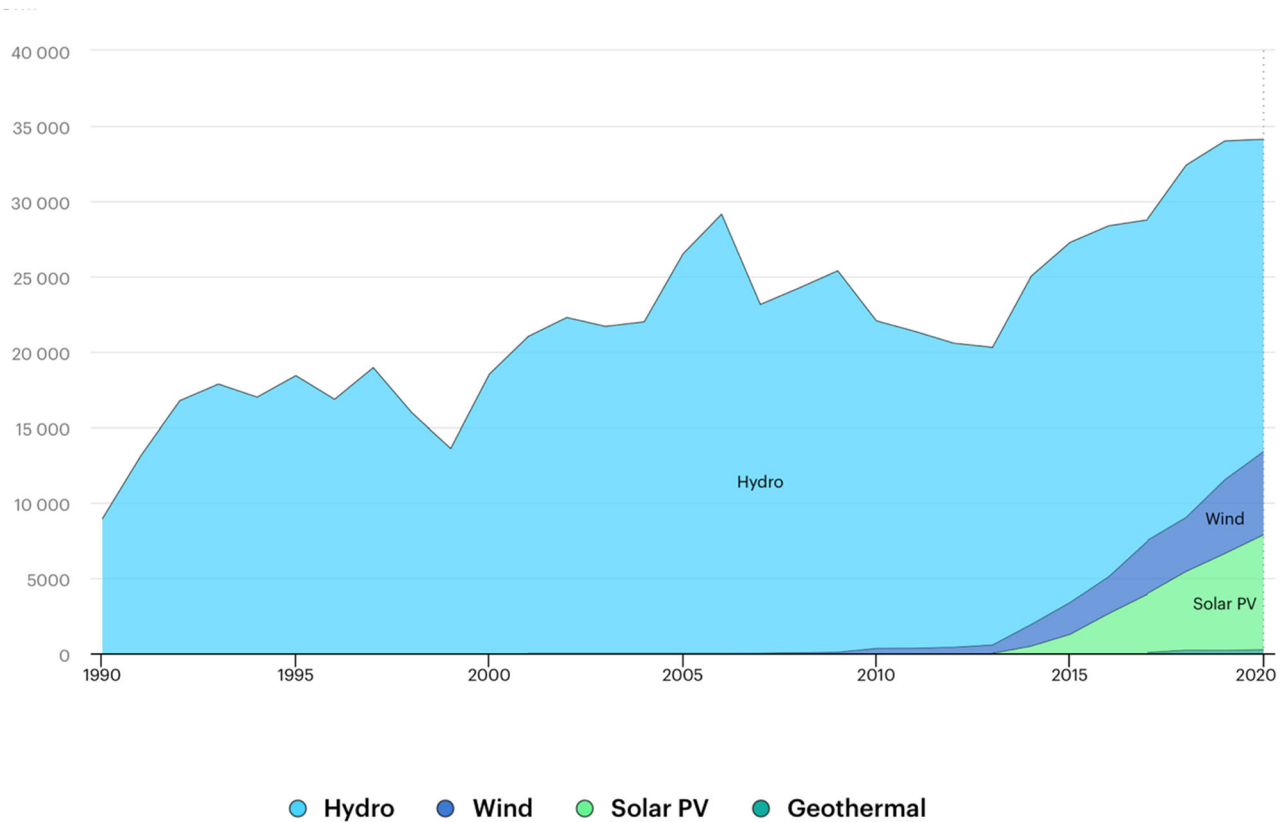


Fig. 3 Renewable electricity generation by source (non-combustible), Chile 1990–2020 (GWh). Source: [Electricity Information - Data product - IEA](#).

relation to environmental sustainability. This process might also involve layering policy instruments when novel policy instruments in support of greater sustainability will be introduced in parallel to maintain the priority of economic affordability.

Each of these priorities also involves changing the roles and responsibilities of different private and public actors in bringing about the desired effects, including the changing role of the state¹¹. For example, more competitiveness is traditionally linked to a more discrete regulatory role from part of the state, while sustainability and energy security are often associated with a more interventionist role²². Nevertheless, policy bricolage might involve further hybridisation of the role of the state blending state intervention and liberalisation to steer energy transition in the region^{47–49} leading, for example, to green capitalist developmental model ‘that draw from but also challenge neoliberal principles and build state distribution programs to address poverty and unemployment’⁵⁰ (p. 4).

METHODOLOGICAL APPROACH

This comparative study employs process tracing as an overarching methodological approach to distil the temporal aspects of causality between analysed phenomena of policy failure and policy bricolage^{51,52}. Process tracing can be defined as ‘an analytical tool for drawing descriptive and causal inferences from diagnostic pieces of evidence – often understood as part of a temporal sequence of events or phenomena’⁵³ (p. 824). This method was useful for reconstructing the temporal dynamics of the evolution of the Mexican and Chilean energy sectors and policy reforms during the past decades. We followed an explaining-outcome process tracing, which ‘goal is not to develop a generalisable theorised mechanism but instead to craft a case-specific explanation of the major factors in a case’⁵¹ (p. 281).

We describe the following phenomena linked in the causal chain: energy crisis—discourse about policy failures—policy bricolage. The interpretation of causal relations between each of these phenomena required the employment of different approaches for qualitative data collection and analysis.

First, we developed a timeline of the evolution of the energy sectors marking significant events in relation to the dynamics of the diffusion of renewable energy. Therefore, on the one hand, we identified the crises of energy supply disruptions, and, on the other hand, decisions as a reaction to policy failures marking the promotion of renewable energy sources, such as adoption of new laws. For this purpose, we conducted a systematic literature review drawing from primary and secondary sources, as well as news platforms.

Second, to understand the nature of policy bricolage, we zoomed in on energy laws and regulations. Drawing from Heffron et al.⁵⁴, we focused on the existence of different energy law principles related to energy sustainability, security, and accessibility constituting the energy trilemma. For this purpose, we analysed the content of the general parts of energy laws adopted after the recognised policy failures.

Finally, we traced the public debates linking the meanings of the identified energy crises and adopted regulatory changes. Building upon emerging discursive approaches to the study of energy policy⁵⁵, the understanding of policy failures and the recognition of the nature of contradictions were identified by analysing the discursive frames of energy crises. Based on the strategic interaction approach, Goffman defined frame as the ‘schemata of interpretation’ that enable individuals ‘to locate, perceive, identify, and label occurrences within their life space and the world at large’⁵⁶ (p. 21). Framing involves ‘promot[ing] a particular problem definition, causal interpretation, moral evaluation and/or treatment recommendation’⁵⁷ (p. 52). Frames have a

diagnostic (identification of the problem and attribution of blame), a prognostic (solution to the problem, strategies, and tactics), and a motivational (rationale for action) component⁵⁸. During this stage, we synthesised the dominant frames indicating the origins of energy crises and their possible solutions in governmental documents and public statements of key political actors as well as during parliamentary debates on energy regulatory reforms and press notes published in national newspapers.

This study compared two case studies selected following the method of agreement approach. Despite differing initial conditions, energy policy failure provides a plausible explanation for the energy transition. Both cases are dissimilar in terms of the features of energy systems and the dominant policy paradigm (dominant actors, ownership structure, role of the state, and resource availability) before initiating policy transitions. Both countries are also presented as successful examples of energy transition due to the high dynamics of installed renewable energy sources. Most of the non-hydropower renewable installed capacity in both countries is concentrated in wind and solar energy. Before that, they were considered for many years as green laggards, failing existing models of energy policies^{59,60}.

POLICY FAILURE AND ENERGY TRANSITION AND LIBERALISATION IN MEXICO

The Mexican case illustrates the way in which a creeping crisis was successfully framed as a critical failure of dominant policy ideas of energy nationalism and the public service of energy. Contestation led to a bricolage of policy ideas, where national sovereignty lost relevance to the affordability of electricity and competitiveness in the sector. In this context, renewable energy has become a legitimisation tool for ideas in favour of the privatisation of assets and liberalisation of the energy sector.

Critical failure of energy policy in Mexico

The power sector and its public utilities in Mexico have historically been linked to energy nationalism. Mexico nationalised the power

industry in 1960, and the electricity public service was vertically integrated for decades⁶¹. The state monopoly consisted of two public utilities: the Federal Electricity Commission (CFE) in charge of the production and distribution of electricity for almost all federal states, and the Power and Light Company of Central Mexico (LyFC) concentrating on Mexico City and its surroundings⁶². Like the oil industry with PEMEX, the Mexican electric power industry grew in the shades of this nationalisation process, obtaining an important ‘symbolic weight’⁶³ (p. 855). The Public Electricity Service Law, reformed in 1992, allowed private actors to generate power under limited schemes¹⁸. For many analysts, this change meant a ‘simulated opening’ of Mexico’s power system⁶⁴. Given that the Mexican Constitution excluded private participation in the power sector linked to the public service of electricity, the above-mentioned law established that generation oriented toward self-sufficient supply, cogeneration, small production, or exportation would not represent public service⁶⁵.

In practice a hybrid unique buyer model was introduced, where private generators could generate power for their own consumption or sell it to state-owned companies⁶¹. Vargas⁶⁶ argues that the Mexican government promoted the ‘foreignization’ of the sector for years with the argument that public utilities didn’t possess enough resources to invest in new generation capacity. This process was invigorated with the adoption of the Law for the Use of Renewable Energy and the Energy Transition Financing in 2008, which for the very first time incorporated renewable energies in the national electricity mix⁶⁷. However, the growing electricity demand was covered both by renewable energy sources as well as an increasing consumption of natural gas produced domestically and imported from the United States (see Fig. 4).

The decision of partial liberalisation of the national market affected the structure of incentives, leading to the collapse of public utilities. Given that private generators invest mainly in renewable energy⁶⁸, these legal changes constituted both the inception of energy transition in Mexico and the origin of an energy crisis that would transform Mexico’s electric power system.

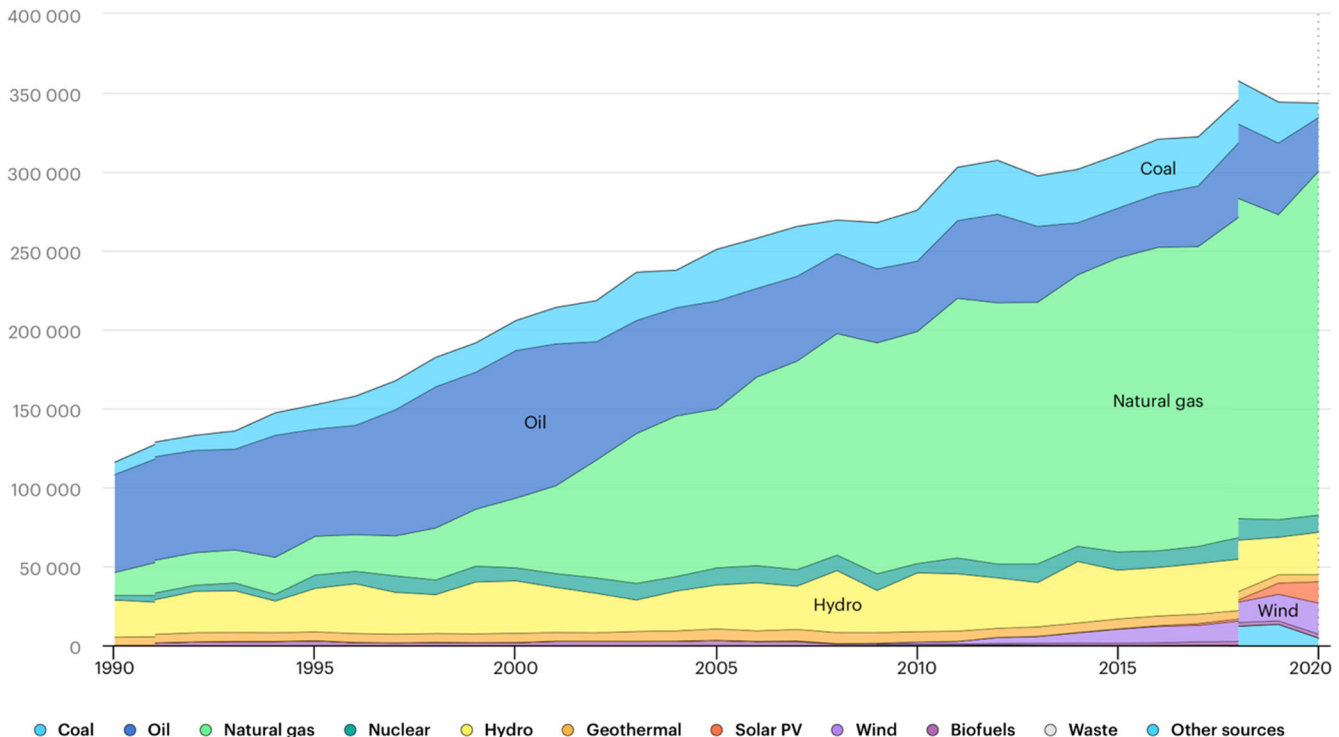


Fig. 4 Electricity generation by source, Mexico 1990–2020 (GWh). Source: [Electricity Information - Data product - IEA](#).

Over the years, the model benefiting private operators generated an imbalance in the technical and financial operations of public utilities^{61,64}. In 2000, private producers represented 10.7% of the installed capacity, and this figure grew up to 35.2% in 2008⁶⁹. The LyFC situation captured the creeping crisis affecting Mexico's power system, given its historical debt with CFE, the technical and operative problems generating critical zones in the service⁶⁴, and the constant blackouts the capital of the country endured⁷⁰. After years of conflict between the left-wing Mexican Trade Union of Electricians and the Mexican government^{62,71}, in October 2009, President Calderón (in office 2006–2012) closed the public utility LyFC and transferred its assets to CFE^{62,66}. Whereas at the international scene Calderón actively promoted a climate change and green economy discourse, nationally he confronted a leftist union and promoted the privatisation of the sector. In this context, the closure of the company constituted a tipping point that paved the way for further liberalisation of the Mexican energy sector as well as an increased diffusion of renewable energy sources.

Framing the failure of the state ownership in Mexico

Two discourse coalitions existed during the energy policy debate in Mexico. While central and conservative parties supported by the economic elite traditionally promoted instruments and regulatory frameworks allowing the participation of the private sector, the so-called national revolutionary parties aimed to defend national sovereignty⁷² (p. 220). These coalitions played a central role during the debates of the Constitutional Energy Reform in 2013.

The 2009 LyFC closure can be understood in light of wider changes in the Mexican economy and the adoption of a neoliberal model⁶². Its closure was executed through the taking of its facilities by the federal police forces followed by a presidential decree⁷¹, so this move needed broader recognition from political and social actors. With this purpose in mind, the federal government put in motion a millionaire media campaign to promote the advantages of the decision⁷³. Overall, the official discourse emphasised the need for modernisation of the service in relation to its quality and the levels of client satisfaction⁶⁴ (p. 349). Supported by business organisations^{74,75}, the federal government framed the closure as a contribution to the national economy and public interest by enhancing fiscal responsibility, efficiency, competitiveness, and service quality^{64,76,77}. The solution for this coalition was to promote the liberalisation agenda and modernisation of the industry, blaming public utilities for the creeping crisis affecting the power system⁷⁸. Whereas Calderón's government projected greater participation from the private sector in the power generation, for the LyFC Trade Union this was 'an irrational loss affecting the national sovereignty'⁷⁹.

For LyFC advocates, the only goal of the governmental campaign was to isolate the electricians from the rest of society and win public opinion in favour of the government's position⁷¹ (p. 316). The framing dispute focused on the sense of public service, confronting the federal government arguing in favour of economic efficiency against public utilities seeking political commitment to rescue them^{62,64,71}. Critical voices sustained that the background of this action was the privatisation of the power sector to the detriment of public interests⁸⁰. Against the governmental media campaign, the electricians employed demonstrations, rallies, and even hunger strikes to disseminate their message; only very few left-wing media supported them. This coalition not only highlighted the intense local opposition faced by several renewable energy projects but also pointed out that the participation of private generators brought high costs for the system and the final users, leading to distortions in the system⁶⁶ (p. 132). This coalition also criticised that this process brought the recognition of market rules in the energy sector and led to the depoliticisation of energy policy debates and the delegitimisation of public service⁶⁴.

The government of Enrique Peña Nieto (in office 2012–2018) enacted in 2013 broad constitutional reforms supported by all branches of government and across the political spectrum, including three main political parties (PRI, PAN, and PRD, representing the centre, right, and left, respectively). This transversal coalition called Pact for Mexico supported liberalisation and privatisation reforms, including foreign investment, in strategic areas such as energy⁷. Initially conceived to rescue the finances of the state-owned company PEMEX, the energy reform expanded to the electricity sector and was justified based on boosting competitiveness, reducing tariffs, and promoting clean sources of energy against the reliance of CFE on fossil fuels for electricity generation⁶¹ (p. 41). Renewable energy produced by private generators functioned as a legitimisation tool for the privatisation and liberalisation of the power sector.

For the minority of the opposition, this reform not only meant privatisation, but also the delivery of oil, natural gas, and electricity to foreign companies and dismantling PEMEX and CFE. Before the voting of the constitutional reform, the opposition emphasized in relation to CFE that 'the nature, goals, governance, and performance criteria of the company should not be assessed following administrative-corporative efficiency and the decisions about its future should be democratic'⁸¹ (p. 127). However, the wide support for the constitutional and subsequent legislative reforms illustrated the almost uncontested recognition of crisis as the state failure to guarantee security of affordable energy supplies, which required the modification of the ideational basis of the implemented policy.

Policy bricolage – the expansion of renewable energy and liberalisation

The change led to policy bricolage in Mexico by the opening of the sector to new actors and consequently the regulation of new policy areas facilitating energy transition. It also led to the redefinition of the state intervention in the sector toward regulatory approach rather than public ownership.

The constitutional reform in 2013 recognised the partial opening of the energy sector to private actors⁶³. Changes in the power sector brought by the Electricity Industry Law adopted in 2014 and Energy Transition Law (2015) stipulate the unbundling of state monopolies, the opening to foreign investment in the whole productive chain, and the creation of a wholesale market⁶¹ (p. 42). The government remained responsible for the public service of transmission and distribution of electricity, which are considered strategic areas, creating the state-productive utility CFE Transmission (a subsidiary of CFE)⁸². Nevertheless, the Secretary of Energy and CFE Transmission can celebrate contracts with private companies for the installation, maintenance, management, operation, and expansion of the system. In addition, the Mexican Electricity Industry Law introduced the category of 'clean energy' technologies, including renewable energy sources, large hydro, nuclear, efficient cogeneration, and carbon capture and storage plants and their definition, targets, and regulation were specified in the Energy Transition Law⁸³.

The Mexican Secretary of Energy (SENER), in charge of energy policy and the coordination of sector restructuring, steered the process of dismantling the dominance of the state in the sector. At the same time, Mexico reinforced independent supervisory governance structures and transferred regulatory competence from SENER. For this purpose, Electricity Industry Law adopted in 2014 allowed the creation of an independent system operator, the National Energy Control Center (CENACE), responsible for market regulation, planning, and expansion of the system to guarantee open and non-discriminatory access to the national transmission grid and general distribution grids. This decentralised public unit oversees the national electricity system, and since 2016, the wholesale electricity market⁶¹. Similarly, the reform reinforced the

Energy Regulatory Commission (CRE), in charge of the electricity and gas sectors as well as the operation of the clean energy certificates (CECs) to promote the efficient development of the industry, stimulate competitiveness within the sector, protect the interest of energy users, contribute to adequate coverage of the national system, and procure the reliability, stability, and security of the supply and service delivery. The system of auctions organised by the CENACE (with the CRE's authorisation), in which bidders can offer capacity, cumulative energy, and CECs, was a keystone of the reform. The auctions, neutral with respect to qualifying technologies, were mainly designed to allow suppliers of basic services to buy power and CECs in a competitive way.

However, Mexico's President Andres Manuel López Obrador (AMLO, in office since 2018) promoted a reform that turns back to a state-centred energy policy⁶⁸. AMLO's proposed reforms aim to eliminate the market mechanisms and regulatory bodies created during the past administration, CFE's vertical and horizontal integration, and the dismantling of market rules for the sector⁸⁴.

POLICY FAILURES AND THE STATE INTERVENTION IN ENERGY TRANSITION IN CHILE

The debates about the energy crisis and policy failure in Chile stimulated the regulatory modifications of energy policy tools. The emerging policy bricolage contributed to the softening of the liberal energy market orthodoxy by including policy instruments which would also contribute to energy security and environmental sustainability and strengthen the role of state institutions in energy policy.

Ordinary failure of energy policy in Chile

Chile adopted full-scale liberalisation involving the privatisation of public assets, deregulation, horizontal and vertical unbundling, and the marketisation of the energy sector in the 1982 Electricity

Law. The subsidiary role of the state relied on the support for private initiatives to develop a competitive electric power market and interventions only in the case of market failures. Public authorities (National Energy Commission – CNE) regulated prices exclusively for residential consumers (households and small companies)⁸⁵. Nevertheless, the Chilean electric power sector has suffered from a creeping crisis punctuated by acute shocks since the 1990s⁸⁶. Electricity blackouts in 1998–1999 due to parallel drought and the increased growth of demand^{87,88} proved the fragility of the reliance on large hydropower sources and turned the attention to gas supplies from Argentina⁸⁹. However, Argentina has progressively limited its gas supply despite previous costly infrastructure investments. In 2007, the drought limited the supply of hydropower, and Argentina fully stopped the gas supplies, proving the failure of the diversification strategy of using natural gas as a substitute for hydropower (see Fig. 5).

The 2007–2008 energy disruption exposed the contradictions between the growing energy demand, insufficient investment, dependency on costly and non-reliable fossil fuel imports, and increased prices for consumers, decreasing the competitiveness of the Chilean economy^{48,90}. Altogether, these factors led to an overall increase in energy prices in Chile, hampering the competitiveness of the economy relying on the export of minerals requiring energy intense extraction⁴⁸. For example, the growth of energy demand by 40% in the period 2006–2016 correlated with a 40% growth in GDP during the same period.

Above critical events triggered regulatory changes in Chilean energy policy. The adoption of the Law on Renewable Energies in 2008⁹¹ amended in 2013⁹² and the adoption in 2015 of the Energy Policy 2050 strategic document⁹³ constituted key regulations for the inclusion of renewable energy in Chile. These changes took place in the context of ongoing regulatory reforms that contributed to the inclusion of renewable energy sources into energy systems by modifying the framework for policy tools in line

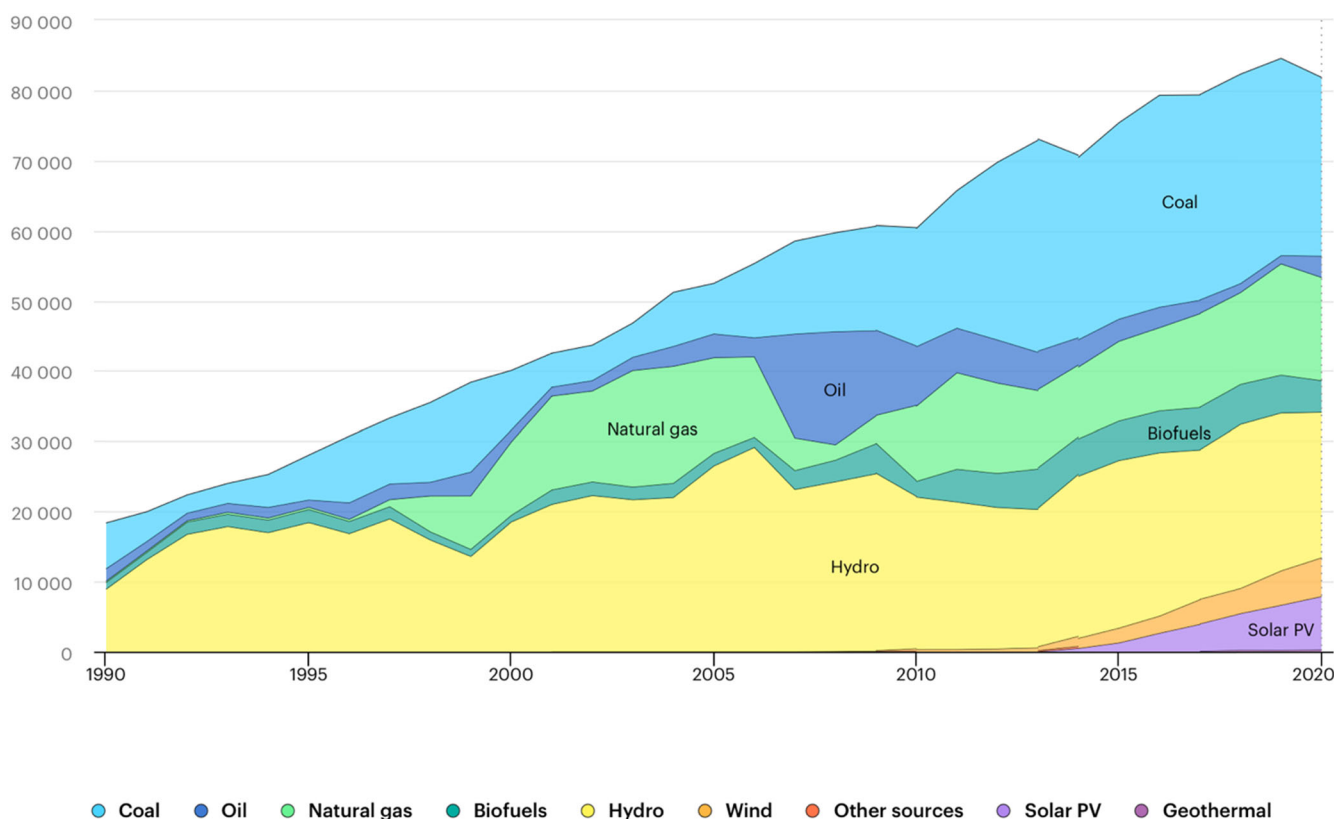


Fig. 5 Electricity generation by source, Chile 1990–2020 (GWh). Source: Electricity Information - Data product - IEA.

with the policy objectives^{60,94,95}. Their adoption mediated by shifts in the framing of energy sector in Chile reflected policy change leading to policy bricolage.

Framing the failure of market liberalisation in Chilean energy policy

The framing of policy failure in Chile focused on security of supply as well as environmental and socio-economic sustainability, allowing greater governmental intervention in the market, while preserving different elements of the neoliberal market-based policy approach^{44,48,59}.

The dominant view supported by private sector in 2000s attributed the origins of Chilean creeping crisis energy policy to exogenous factors⁴⁴. However, subsequently, the framing of supply disruptions converged that it was an ordinary policy failure affecting the energy equity, accessibility, and affordability aspects of the energy trilemma. The failure to deliver on the distribution of costs for consumers highlighted existing policy paradigm contradictions. In view of the dominant idea that the liberal model of energy policy stimulated economic development, the crisis was framed in terms of the market failure of private competition due to the inadequate public regulation of ownership concentration and prices^{26,96,97}. It led to the recognition of ordinary failure framing attributed to deficient market architecture of price signals leading to insufficient investments of private actors. The blame of the crisis was attributed by private sector supported by neoliberal experts to the state rather than to private companies, and the proposed solutions were to further liberalise the sector⁹⁸ as well as to instal even more hydropower projects⁸⁹. At the same time, only a few voices from environmentalist civil society groups pointed to contradictions between the energy situation in Chile and the assumption that private actors following liberal market mechanisms would guarantee competitive and affordable energy supplies necessary for economic growth and private consumers⁸⁷.

During the debates about new non-conventional renewable energy (NCRE) law, the frames of security of energy supplies and environmental sustainability emerged bundled to balance economic equity concerns. Such contradictions as the steady increase in fossil fuel energy supplies⁹⁹ and their impact on greenhouse gas emissions and climate change^{48,100,101} have been increasingly recognised by wider public and mainstream political parties as well as the government as flaws inherent to the existing policy design^{44,102}. Nevertheless, given the domination of the liberal market paradigm, the 2008 Renewable Energy Law was framed again as a solution to market failures of attracting NCRE investments, yet it also mentioned that in this way, it would enhance security of supply and respect environmental concerns⁹¹. The president of Chile framed this law as a contribution to the economic efficiency of security of supply and environmental sustainability by focusing on creating favourable conditions for NCRE investments by accelerating market development, suppressing market entrance barriers, and compatibility of these sources with electric market operating in this country⁹¹ (p. 278). In parallel, the Chilean government recognised that energy policies 'must not simply follow the principles of technical and economic efficiency, but also security, sustainability, and equity'¹⁰³ (p. 50).

The initial failure of NCRE diffusion was attributed by private sector again to the inadequate regulatory and institutional support for the economically efficient operation of NCRE due to insufficient governmental leadership in addition to technical and infrastructure barriers^{95,104–106}. However, in the context of the continuous energy crisis in Chile, energy security and sustainability concerns have become increasingly emphasised by the government, political parties and civil society. These frames provided discursive reference to oppose the future development of hydropower supported by a lobby of private owners of generation facilities. The development of hydropower became contested

given the failure to provide secure energy supplies during the draughts and exposed the contradiction between different environmental and social priorities and marketisation and privatisation⁸⁹. Moreover, numerous environmental conflicts involving conventional hydropower and thermal power projects have visualised the contradictions between different economic, social, and environmental ambitions^{26,107,108}. As a result of strong social bottom-up opposition, the government terminated the HidroAysen hydropower megaproject in 2014, including the construction of five dams. It marked the recognition of the failure of hydropower as a conventional renewable energy source by different political parties, the government, private actors, and social environmental movements, while the other non-conventional renewable energy sources were framed as contributions to local economic development and to the diversification and security of energy supplies²⁶.

As a result of this recognition, building upon previous regulatory changes, new wave of regulations since 2010 attributed the energy crisis mostly to an exclusive focus on energy efficiency and affordability at the expense of the security of energy supply and socio-economic and environmental sustainability. Therefore, the novel approach tried to rebalance energy trilemma priorities and emphasise that 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'⁹³ (p. 10). In this sense, renewable energy sources contribute to the overall security of the system as well as 'can be developed in an integrated manner' with energy efficiency and progressing towards a more sustainable energy matrix⁹³ (p. 43).

Policy bricolage – the expansion of renewable energy and the state intervention

The change of energy policy intensity leading to policy bricolage in Chile involved the expansion of intervention to new goals and instruments facilitating renewable energy transition following the reinforced role for the state in the sector. The expansion of the areas covered by energy policy evolved gradually. In the first period, the legislative reforms tried to correct market-related factors believed to be behind the 1998–1999 crisis⁹⁷. The first regulatory change allowing the inclusion of non-conventional renewable energy took place through the Electric Short Laws I and II adopted in 2004 and 2005^{96,109}. In this period, the NCRE was never considered as a priority given the opposition of dominant market efficiency supporters. The new legislative framework included some policy instruments to support the diffusion of renewable energy sources as a solution to the failure of market mechanisms^{26,109}. Both Short Laws reaffirmed the validity of the existing market-driven model and focused on the policy instruments' adjustments to recover the equilibrium between the offer and demand, reasonable costs, and quality¹¹⁰. They also provided an embryonic framework for renewable energy sources by introducing the category of non-conventional renewable energy, allowing preferential treatment for small (up to 20 MW) projects and established a program to promote small-scale projects for the generation of renewable energy¹¹⁰.

In the second period, the first law on renewable energy sources⁹¹ redefined the NCRE category and established quota obligations to be accomplished at a national level between 2010 and 2024, as well as financial penalties for not meeting the targets. After the approval of the 2008 Renewable Energy Law, other tools significantly modified the exclusive role of the market price mechanisms governing the energy market in Chile and enhanced governmental planning and supervisory roles¹⁰². Further expansion of policy regulation took place through the promotion of new regulatory mechanisms since 2010 and, in particular, during the second term of President Bachelet (2014–2018). It took place also

due to the increased competences of the state to govern the sector. The Ministry of Energy created in 2010 has the tasks of elaboration, coordination, and implementation of national energy policy, including legislative work as well as the supervision and coordination of other public administration entities involved in energy policy¹¹¹. The Ministry is responsible, among others, for the formulation and implementation of renewable energy policy as well as its technical regulation, while the Ministry of Environment, also created in 2010, is in charge of the monitoring and control of different environmental aspects of energy policy. The transmission law in 2016¹¹² enhanced the role of state authorities in the supervision and operation of the transmission grid by introducing a unified independent system operator and promoting the National Electric System in Chile, unifying the two biggest transmission systems¹¹³ (p. 92).

The adoption of the Energy 2050 programme illustrated a renewed transversal consensus around energy policy in Chile⁸⁶. Different Chilean reforms increased the role of the NCRE step-by-step due to the stronger role of the government in policy implementation. In 2013 Chile increased⁹² the quota obligations from 5% of electricity produced from NCRE until 2014 and 10% in 2024 established in 2008⁹¹ to at least 20% of electricity from NCRE by 2025. Energy Policy 2050 includes another ambitious long-term target: at least 70% of the electricity generation matrix will come from NCRE by 2050⁹³.

In parallel to the debate about Chilean energy strategy, the adopted laws included also the simplification of the procedure of granting electricity concessions to energy generators and distributors¹¹⁴, improved the bidding system for electricity supply for customers subject to price regulations¹¹⁵, established mechanisms of fairness in electric service tariffs¹¹⁶ and established the new electricity energy transmission systems creating an independent body of the national electrical system¹¹². Chile reformed in 2013⁹², the auction system adopted in 2005¹⁰⁹ to organise special auctions for NCRE when the obligatory quota is not met. Further changes adopted in 2015¹¹⁵ aimed to increase the level of competition to reduce the prices for consumers through the adjustments of auctions' settings, such as the introduction of hourly blocks and the extension of contract duration. Different regulatory reforms were motivated in terms of the ordinary failure of policy tools to accomplish the expected results. For example, the recognition of auction mechanisms flaws as an ordinary failure of market incentives focused on the efforts of different groups on its adjustments^{92,112,115}. As a result, the regular system of auctions registered an impressive growth of competition with an increasing amount of contracted energy originating from renewable energy and, in particular, wind power¹¹⁷. Auctions attracted an increasing number of bidders (1 – 2012, 2 – 2013, 18 – 2014, 38 – 2015, 84 – 2016, 24 – 2017) and prices dropped by 75% (from USD 131.4/MWh in 2012 to an average of USD 32.5/MWh in 2017).

DISCUSSION

As illustrated by the cases of Mexico and Chile, this article shows that one of the factors motivating energy transitions in LAC countries is policy failure. Regulatory reforms lead to a bricolage policy framework that combines novel and older policy ideas and instruments, opening avenues for renewable energy sources. Both cases illustrate the creeping crisis of the existing models of electric power policies due to the perceived collapse of the structure of incentives for producers and consumers and the need to balance energy trilemma priorities.

In both cases, the supporters of different energy policies concentrated on shifting the role of the state in the energy transitions towards renewable energy sources. At the same time the observed shifts are different from the perspective of the energy trilemma. While in Mexico the goal of economic affordability, efficiency, and competitiveness facilitated the

entrance of 'clean energies' into the market, in Chile the improvement of the security of energy supplies and environmental concerns combined with the liberal market model paved the way to NCRE. Mexico liberalised its energy sector to regulate the greater participation of private actors which contributed to the diffusion of clean energy sources such as solar and wind power. The reforms in Chile enhanced the governmental role to steer energy transition with the aim of enhancing the security of energy supplies and addressing environmental sustainability concerns. Considering different points of departure, in Mexico, renewable energy benefitted from a weaker participation of the state in the power sector, while in Chile, this was possible due to the strengthened regulatory role of the state.

This study shows that the framing of energy crises as policy failures contributes to policy change. The differentiated recognition of energy policy crises frames the substantive scope of energy policy reforms. The framing of energy crises as critical failure led to problematise in Mexico the ideational foundations and normative assumptions of energy policies, while the framing of energy crises as ordinary failures motivated the adjustment of policy instruments in Chile. The emergence of different framings does not depend on the nature of underlying crises, but on policy alternatives supported by policy actors. In the case of Mexico, critical failure related to the economic criteria of efficiency was supported by large policy coalition supporting liberalisation in view of wavering support to state-led energy policy. In the case of Chile, the recognition of deficient security of supply and environmental concerns emerged as ordinary failure due to the limited capacity of policy actors to contest the dominant liberal paradigm of energy policy. Nevertheless, in both cases, renewable energy diffusion benefited from the interpretations of extraordinary events challenging established worldviews on policies, yet the subsequent trajectories of transition were shaped by intense policy conflicts confronting path dependencies supporters with the supporters of energy policy alternatives.

Shifting political support may lead to policy retreat, reversal, and dismantling. The present Mexican administration attempts to reverse many of the changes that took place over the past years in the electricity sector, having already cancelled the fourth auction for renewable energy and contracts for the construction of transmission lines benefitting private generators. It also intends to set limits on private participation in power generation. In other words, the pattern linking energy supply disruptions, claims of policy failures, and subsequent regulatory reforms are leading to another twist in policy bricolage in Mexico.

The cases of Mexico and Chile illustrate that this perspective could extend our understanding of political debates about energy transitions in both countries. Rising energy prices in Chile mobilised claims regarding the distribution of energy costs and benefits for society and consumers, as well as its accessibility. Given that renewable energy sources contributed to curbing the growth of electricity costs for consumers, there is considerable support for energy policy evolution. Similarly, in Mexico, debates also addressed the distribution of costs and benefits between private and public companies and consumers in general, overlapping with policy inconsistencies between dominant actors clashing about different policy ideas. For example, a different distribution of costs and benefits justifies AMLO's administration intentions to put an end to the unbundling of CFE and limit foreign investors' role. Similarly, the dismantling of programmes and initiatives such as renewable energy auctions and the Climate Change Fund¹¹⁸ expose inconsistencies between new and old governments.

CONCLUSION

This article shows that the recognition of policy failures constitutes a window of opportunity for regulatory reforms supporting the

diffusion of renewable energy in LAC countries. Depending on the country, it has become part of different reform processes to either facilitate (Mexico) or maintain (Chile) the liberalisation of the sector. Therefore, understanding the framing of energy policy crises and the formation of competing discursive coalitions is essential for explaining energy policy change in LAC countries as well as resistance and opposition to renewable energy.

Our analytical approach links the dynamics of the recognition of energy policy failure, their interpretation through discourse frames and subsequent policy change. This contribution shows the suitability of an analytical framework drawing from constructivist approaches and discursive institutionalism to understand the reconsideration of policy ideas during the process of framing of crises^{119,120}. The distinction between critical and ordinary failure frames the scope of policy response. The framing of critical failures aims to justify paradigmatic policy change, while the framing of ordinary failures justifies policy adaptation within the existing policy paradigm. In both cases, policy failures benefited the diffusion of renewable energy given the opening for private actors in Mexico and the increase of state intervention in Chile respectively.

In this way, it helps to understand the emergence of policy bricolage merging different old and new policy ideas and instruments in response to shifts in the balance between different elements of policy trilemma. The key element of this approach allows to understand that the process of energy transition and the inclusion of new renewable energy sources in the energy mix depends on the initial conditions of energy sector as well as debates about energy policy failures. They can lead to different outcomes either reinforcing or limiting the role of the state intervention in the sector. To capture these different outcomes, our approach focuses on the shifts in the dominant policy frames in the era of energy uncertainty.

Energy policy tends to belong to the technocratic realm^{59,121,122}, but different factors lead to societal discussions on the future of energy policy debates. This trend progressively reduces the margins for narrow technical narratives about energy transitions without considering the wider political, economic, social, and environmental implications of energy models. While renewable energy can certainly stimulate economic and social development in the region, they can also be linked to negative impacts, as demonstrated by the socio-environmental conflicts that have spread across the region against renewable energy projects. These tendencies affect the energy sectors of LAC countries, where market ideas (together with the neoliberal economic model) are being placed under contestation. Therefore, the barriers for energy transition in the region are not only technical but also political, as shown in the Mexican case of policy reversal against market mechanisms supporting energy transition. As a result, future research on the evolution of dominant discursive frameworks for energy policies in the region can contribute to better understanding of policy changes and energy transitions.

Received: 21 June 2022; Accepted: 31 January 2023;
Published online: 15 March 2023

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ACKNOWLEDGEMENTS

This research benefited from the Inter-American Development Bank (Competitiveness, Technology, and Innovation Division) research grant ESW RG-E1546 Green innovation in LAC: patterns and policies to study the diffusion of wind power in Latin America. The authors acknowledge the support provided by Simon Sasso and Matteo Grazi from the IADB to a research report which marked the inception of this article. The research for the Mexican case of this article was supported by the PAPIIT research grant IA302721 ‘AMLO’s populist frame: a transversal study of the 4 T’s public policy (POPUL4T)’, funded by the National Autonomous University of Mexico (UNAM).

AUTHOR CONTRIBUTIONS

M.N. and I.S. contributed to the Conceptualisation, Methodology, Investigation, Writing – Original Draft, Reviewing and Editing; M.N.: Investigation on Chile, I.S.: Investigation on Mexico.

COMPETING INTERESTS

M.N. declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. Israel Solorio declares that he is member of Editorial Board of the journal Climate Action.

ADDITIONAL INFORMATION

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