

15 Neoliberalism as Political Technology: Expertise, Energy, and Democracy in Chile

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Chile's unique policy path can largely be attributed to a uniquely powerful and ideologically coherent team of free-market technocrats, with a long-term vision for the Chilean economy.

Fourcade-Gourinchas and Babb 2002, 545–546

Neoliberalism has had a profound impact on contemporary Chile. Neoliberal policies redefined sectors and institutions in industry (Ffrench-Davis 1980), labor (Foxley 1983), health (Ossandón 2009), the city (Portes and Roberts 2005; Sabatini 2000), and the environment (Liverman and Vilas 2006), from the 1970s through today. Many say that nowhere else has neoliberal restructuring been more extended and aggressive (Klein 2008; Lave, Mirowski, and Randalls 2010). In addition, the link between neoliberalism as a set of policies and as an epistemological framework related to the Chicago School of Economics (Van Horn and Mirowski 2009) is embodied in Chile by the infamous Chicago Boys—a group of Chicago-trained economists, endorsed by the military regime, who overhauled the Chilean economy in the late 1970s and early 1980s.

Although an abundant literature exists on neoliberalism in Chile, we identify two accounts still missing from this history. First, neoliberalism has been understood more as an epochal and abstract force than as situated practices. More detailed analyses of how neoliberalism unfolded in specific sites and through specific controversies are needed to interrogate the material and knowledge practices that enact neoliberalism. Second, while a robust literature has focused on the arrival of neoliberal ideas and the implementation of neoliberal policies in the 1970s, little has been said about how neoliberal ideology adapted to the post-dictatorship settings of the 1990s and 2000s.

To tackle these gaps, we examine neoliberalism as a *political technology*. Neoliberalism as *technology* means it is applied knowledge about how to define, order, and calculate the world. Neoliberalism as a *political* technology draws attention to how this applied knowledge is used pragmatically and purposefully to transform the state and society. Because Chile's neoliberal experiment was pursued aggressively, it generated tensions and conflicts about how economic beliefs shape government's technical

decision-making practices that are more evident to the researcher than those observed in similar experiences of neoliberal restructuring around the world. Furthermore, Chile's experience sheds light on the role of scientific and technical expertise in government across authoritarian and democratic regimes, adding to the growing STS literature on science, the state, and democracy (e.g., Ezrahi 1990; Jasanoff 2004). We argue that neoliberalism is active, malleable, and productive. In Chile, it operated as a set of purposeful practices to change the role of experts and the state; yet these practices were pragmatic enough to adapt to the demands of Chile's post-Pinochet return to democracy.

We analyze two cases that illustrate crucial moments in neoliberalism's Chilean trajectory. The first case examines how energy policies were neoliberalized in the late 1970s. In 1979, the National Energy Commission, led by the Chicago Boys, canceled Chile's growing nuclear energy program. Using new techniques and definitions, the National Energy Commission imposed a "pure" economic evaluative framing that displaced traditional energy planning principles: the role of the state was minimized, political considerations were erased, and the predominant engineering culture changed to one that privileged the expertise of economists. The second case examines how neoliberalism was deployed thirty years later in the highly divisive controversy over whether to approve HidroAysén, a project to build five mega-hydroelectric dams in Patagonia. We argue that, as a political technology, neoliberalism was first performed through economists and later was scripted in the practice of science at large. The successful inscription of neoliberal logic into democratic institutions reflects its capacity to adapt to social and political challenges, including the arrival of democracy.

Neoliberalism: From a Thought Collective to a Political Technology

The definition of *neoliberalism* is as contested as the subject itself. Some observers define neoliberalism as an extension of neoclassical economics (Harvey 2005). Others argue it is better understood as the active promotion of market-based solutions to a broad range of issues (Lave, Mirowski, and Randalls 2010). Neoliberalism has also been defined as an ideological movement that disempowers the state (McCluskey 2003) or as a US-led "global empire" (Hardt and Negri 2000). As Mirowski (2009) observes, it is not unusual to see neoliberalism represented as monetarism, Thatcherism, Reaganism, or Howardism. Meanwhile, Latin American scholars have usually linked neoliberalism with the augmentation of poverty and inequality since the late 1970s, thus equating neoliberalism with the rise of privatization processes and consumerism (Moulian 2002).

Beyond these differences, there is a tendency to understand neoliberalism as an abstract, ideological, macrosociological force. For example, Plehwe asserts,

“Neoliberalism must be approached primarily as a historical ‘thought collective’ of increasingly global proportions” (2009, 2; see also Plehwe, Walpen, and Neunhöffer 2007). Plehwe uses the term *thought collective* to refer to “a set of shared values and principled beliefs” that allows “community members to effectively communicate across disciplines and audiences in the pursuit of hegemonic strategies” (2009, 35). Whether it is considered an antistate political thought, a free-market ideology, or a *homo economicus*-based imaginary, neoliberalism has thus been framed as a cultural entity—a ubiquitous, collective, and, according to critics, compulsory cosmology.

Scholars have, moreover, examined the rollout of neoliberalism in several Latin American countries, including Argentina (Grimson and Kessler 2005; Teubal 2004), Chile (Foxley 1983; Ffrench-Davis 1980; Gárate 2012), Brazil (Amann and Baer 2002), and Bolivia (Assies 2003; Spronk and Webber 2007). However, such studies have tended to focus on the political economy of national neoliberal transformations without accounting for the micro dynamics at work.

Applying tools and insights from STS, we argue for a micro, situated, and practice-based analysis of the processes of neoliberalization. Our analysis does this by comparing the controversies surrounding the development of two large energy projects, nuclear development in the 1970s and hydropower in the 2000s. The comparison shows how neoliberal assumptions were practically deployed to harness specific ideas about energy development, the environment, and the common good. We claim that neoliberalism needs to be understood as a set of embodied practices that produce knowledge, are adaptable to new political demands, and seek to transform the state. This is an argument not for a new definition of neoliberalism, but for a new analytical tool with which to study it, one that we call *political technology*.

Lakoff and Collier define political technology as “a systematic relation of knowledge and intervention applied to a problem of collective life” (2010, 244). The term *technology* forces the analysis of politics to transcend ideologies and emphasizes “the techniques and practices that give a concrete form to this new political rationality” (Foucault 2001, 410). For Foucault this new political rationality was the eighteenth-century liberal state, but it can also be extended to twentieth-century neoliberalism (Rose 2004).

The prefix “political” points to the productive and intervention-oriented nature of these techniques. As a political technology, neoliberalism is a program to transform the state, the common good, the role of politics, and the modes of decision making in a predefined direction (Mitchell 2005; Mirowski and Plehwe 2009; Goldman 2005). Though closely related to constitutive co-production (Jasanoff 2004), a political technology is prescriptive and interventionist.¹ “It defines and regulates targets of intervention according to a normative rationality” (Lakoff and Collier 2010, 262).² In the case of neoliberalism, this normative rationality contains a clear vision of the desired society—one constituted by the market itself. Neoliberalism thus produces its own

world that realizes and confirms the parameters of a neoliberal epistemology (Callon 1998; Callon, Millo, and Muniesa 2007; MacKenzie 2008; Pinch and Swedberg 2008).

Understood as a political technology, that is, as applied knowledge related to government intervention, neoliberalism can also be viewed as a form of embodied scientific expertise. Neoliberal ideas cannot be abstracted from the fate and fortunes of economics as an academic discipline (Mitchell 2005). Neoliberalism promoted an increasingly mathematical and scientific approach to economics that both displaced Keynesianism and became the undisputed expert knowledge (Dezalay and Garth 2002; Van Horn and Mirowski 2009). The development of this approach was aided by think tanks (Mitchell 2009), universities (Fischer 2009), and several national and international institutions (Centeno and Silva 1998; Dezalay and Garth 2002; Woods 2006). Indeed, its capacity to produce and percolate through technocratic elites around the world is part of neoliberalism's success. Chile's Chicago Boys are exemplary. They displaced Keynesian economists, engineers, and lawyers to become government experts with considerable power. They were pro-science, internationalist, averse to politics, educated in the United States (particularly in the University of Chicago School of Economics), right-wing conservatives, and heavily present in government offices from the 1970s onward (Dezalay and Garth 2002; Markoff and Montecinos 1993; Silva 1991; Valdés 1995).

While Chile's neoliberal experts triumphed over discordant values, meanings, and practices, these triumphs also produced moments of controversy. As Sarewitz (2004) shows, when competing values and interests are at stake, actors mobilize science and the institutions at their disposal to persuade others to join their position (Sarewitz 2004). Controversies expose these practices and the political work that goes into separating "scientific facts" from "values" (Gieryn 1999) and "expert" from "lay" (Callon, Lascoumes, and Barthe 2009). This raises questions such as, How is the role of the state delineated? Who carries authoritative knowledge? Who are the incumbents in a controversy? And how are notions like "representation," "common good," or "risk" organized (Callon, Lascoumes, and Barthe 2009; Jasanoff 2004)?

We examine neoliberalism as a political technology by examining how economic practices were deployed to end the development of nuclear power in Chile in the 1970s, shortly after Pinochet came to power and implemented a neoliberal restructuring of the economy, in comparison with the practices involved in the promotion of hydroelectric power in the 2000s, when neoliberalism and democracy were fairly consolidated (tables 15.1 and 15.2). Our analysis draws from the central finding in STS scholarship that technologies are malleable and adaptable (Bijker and Pinch 1984; MacKenzie and Wajcman 1985) and shaped by users (Akrich 1992; Oudshoorn and Pinch 2003; Wilkie and Michael 2009). As a political technology, neoliberalism must therefore be understood as a set of techniques that transform users and contexts, just as it is transformed by them.

Table 15.1

Timeline of important events in Chilean energy politics

1973	Military government begins (under General Pinochet).
1975	The National Nuclear Energy Commission, together with state-owned companies Endesa and Chilectra, develops the Nucleoelectric Energy Plan. Endesa also proposes to develop HidroAysén.
1977	The National Energy Commission is created.
1979	The National Energy Commission cancels the nuclear power project.
1982–1983	Markets for electricity (DFL1) and water are created.
1987	Chilectra is privatized.
1989	Endesa is privatized. Pinochet loses a national referendum and will step down.
1990–1994	Transition to democracy: a number of legislative and constitutional changes are adopted, including the approval of the Environmental Impact Assessment process in 1994.
2005	Endesa, now a private, multinational company, again proposes HidroAysén.
2011	HidroAysén's Environmental Impact Assessment is approved. Legally, the project could now be built.
2012	HidroAysén is suspended: Colbún, a partner of Endesa in this venture, says "conditions don't exist to move ahead." This is the most recent information available at the time of writing.

Table 15.2

Summary of the three "purifications" under dictatorship and the three "transitions" to democracy

Dimensions	Case #1 (1970s) Nuclear <i>Processes of purification</i>	Case #2 (2000s) HidroAysén <i>Processes of transition</i>
1. Social goods	Energy redefined to its economic essentials. Political goals (national security, environment) stripped from energy planning.	Environment included in energy planning, but fragmented through bureaucratic controls.
2. The state	Distorts proper social and economic performance and is best left out of decision making. State-owned companies are corrupt.	Protects the environment and should be at the center of decision making, but it is weak and centralized.
3. Experts	Economists are the ultimate experts. Engineers are unaccountable and incompetent.	The expertise of natural scientists, environmental engineers, and social scientists is included, but delegitimized.

We use the comparison of these two energy projects to describe how neoliberal ideas have been purposefully and practically applied in the energy and environmental sectors, and how these ideas and associated practices have changed alongside Chile's democratization process. The first section of this paper examines how Pinochet's economic team, organized under the National Energy Commission, made electricity fit into a neoliberal world. We argue that the Energy Commission's economists were able to end the military's nuclear energy program through three technical "purifications": (1) social goods were redefined as economic concerns; (2) the state was eliminated from decision-making for distorting a neoclassical definition of optimal firm performance; and (3) engineers were marginalized, to the benefit of economists.³ In the second section, we move forward thirty years to examine how the environmental impact assessment policies that were used to evaluate projects like HidroAysén challenge the neoliberal premises previously held by the Energy Commission. In response to democratic demands of the time, environmental impact assessment policies implemented three "transitions": (1) social goods were redefined as environmental concerns; (2) the state was put at the center of decision making; and (3) natural scientists became the required experts. Each of these transitions challenged the neoliberal world created in the 1970s, but the reach of the challenge was undermined by practices we detail that left important aspects of neoliberalism intact.

Neoliberalism in the Making: The Chilean Nuclear Energy Plan

Just two years after the military took power, the National Nuclear Energy Commission (Comisión Chilena de Energía Nuclear) submitted to the government a national plan to develop nuclear energy (Plan de Energía Nucleoeléctrica). Together with Endesa, the state-owned electricity generating company, and Chilectra, the state-owned electricity distribution company, the engineers at the Nuclear Commission proposed a detailed technical and economic project to introduce the first commercial nuclear plant by 1990. At the heart of the nuclear program, and its expectations for technological and industrial development, lay a vision of engineers as the standard-bearers of Chile's technological grandeur, embodied in prestigious state institutions like Endesa and Chilectra. As in Mexico or Argentina (see Hagood, this volume; Mateos and Suárez-Díaz, this volume), nuclear power in Chile was also seen as an agent of modernization.

By the mid-1970s, the nuclear energy plan was one of the most important technological programs in Chile and it seemed irreversible. Fascination with nuclear technology was strong across Latin America, and Chile was competing with Argentina—which was also positioning itself as a nuclear power—for geopolitical authority. For years the Chilean government had trained several dozen army engineers in nuclear operations and engineering, signed several assistance and research agreements, and created

networks of institutional and technical allies, including with the United States and the United Kingdom. Above all, Endesa and Chilectra, national symbols of Chile's technological capabilities, had been enrolled in the nuclear project as part of an epic narrative of technological and industrial development. A former military engineer who worked at the Nuclear Commission summarized: "for twenty years, [the army] put a lot of dough into nuclear energy, and not only in steel and construction, but in production, training of people, preparation" (interview by MT, 2012). By 1979, the National Nuclear Energy Plan had evaluated different sites for nuclear power plants, resolved legal and financial considerations, and produced a computer model to design the optimal energy matrix. Nuclear power seemed not only necessary, but also inevitable. By the early 1980s, however, the nuclear power plan was dead.

The nuclear energy plan was submitted for evaluation to the National Energy Commission (Comisión Nacional de Energía), created in 1979 to produce an "efficient market" for electricity generation and distribution. Created following orders from Pinochet's new economic team, the new Energy Commission was meant to correct deviances in the energy sector, where inefficient and co-opted state companies (e.g., Endesa and Chilectra) had a monopoly. The economists worried that electricity operations were guided not by economic criteria but by political incentives, leading to a distorted price system (Rudnick, O'Ryan, and Bravo 2001). As a former Energy Commission officer explained, creating an electricity market required addressing "the issue of [market] prices, then establishing a framework in which the private sector could somehow enter [into the market], and then decentralizing it [to break the monopoly]" (interview by MT, 2012). The new Energy Commission, led by Chicago-trained economists, thus set out to reframe energy production through new economic expertise.

Nuclear energy was the first significant application of the Chicago Boys' reasoning to a large-scale technical project. The economists' primary objective was to *isolate* the economic evaluation of energy projects, and the nuclear energy plan in particular. The Energy Commission saw its mission as secluding decision making from contaminating factors, so the final decision would result from a narrow evaluation that reflected economic reasoning in its strictest, purest form. The economist-experts at the Energy Commission set out to purify the decision on nuclear power in the following three ways, and so came into conflict with the engineers at the Nuclear Energy Commission.

First Purification: Eliminating Political Elements from Economic Decisions

The Energy Commission's experts first set out to demarcate economic elements from noneconomic ones, and to eliminate the latter. Only after disentangling economics and politics would energy prices reflect "real" economic values. The economic experts did not believe that a political project like the National Nuclear Energy Plan could produce "real market prices."

In contrast, the engineers at the Nuclear Energy Commission regarded nuclear energy as a geopolitical issue, as reflected in the way they introduced the project in their 1975 report:

Today's energy crisis is far from solved, and continues to produce profound changes in economic and energy structures around the world; it is altering the force equilibrium in large political-economic influence zones and between States, and is effectively generating new forms of power that could lead to unexpected international confrontations. Economic development and the survival of nations has [sic] a very important relation with their capacity to generate energy. Here lies the importance of this vital world problem. (CCHEN/Endesa 1975, 3)

For nuclear engineers, energy was above all a political issue of cold war politics, including a balance of power, strategy, and economic planning. They also identified some benefits: they praised nuclear energy for its environmental benefits and cleanliness compared to other sources (CCHEN/Endesa 1975, 9). Moreover, nuclear energy had to be assessed as part of Chile's modernization. It could trigger industrial and technological development to an extent never before seen in Chile:

The benefits derived from [the nuclear] project will reach important aspects such as: formation and training of human resources required by a nuclear development of this magnitude, and the following: enhancement of scientific-technical level and infrastructure, preparation of the industry and improvement of quality standards. (CCHEN/Endesa 1975, 10)

In response to such political arguments, the Energy Commission recast nuclear energy in economic terms. The Commission did so by redefining "social benefit": "The basic objective of electricity planning is to determine the generation, transmission and distribution infrastructure that would serve demand, while securing the *maximum benefit for the community*" (CNE 1979, 22, emphasis added). Critically, they defined "maximum benefit for the community" in purely economic terms, arguing that if two energy programs seek maximum social benefit, their costs must be equal. Assuming inelastic demand, then demand should also be equal for both programs. These assumptions about costs and demand led them to equate maximizing social benefit with *minimizing total actual costs*: "social benefit" was purified to mean "the least expensive project."

The Energy Commission, furthermore, framed those elements most dear to nuclear engineers—modernization, industrialization, and technoscientific development—as technically unviable. For example, the Commission criticized the notion of *technology transfer*, an important element in the Nuclear Plan's argument. They stated that the nuclear engineers held exaggerated expectations for national technological improvement. Nuclear development was too complex for Chile whose "national participation in the construction of a first [nuclear] plant will be, in the best of cases, limited to the execution of public works, part of the assembly, and the monitoring of the project." In addition, the Commission felt technology transfer would impose severe

opportunity costs on the state, because “a program of several plants would have to be planned ... generating important overcosts.” In that case, they speculated, it is “worthwhile asking whether there aren’t other activities in the country that justify this allocation of resources” (CNE 1979, 69). Too few plants would not catalyze development, making technology transfer an irrational strategy in the Energy Commission’s view.

Second Purification: Eliminating the State from Energy Management

With political elements isolated, the economists moved to eradicate an even more ubiquitous entity from energy production: the state. Following a long tradition of electric engineering in Chile (Ibáñez 1983), the Nuclear Energy Plan put the state at the center of its project. The Nuclear Plan states: “a country’s energy is a national asset and source of power. It constitutes one of the fundamental infrastructures for National Security. Hence its use, conservation, and development are a fundamental State concern” (CCHEN/Endesa 1975, 3). Endesa personified this “state concern” and national ethos. As a public servant from the National Nuclear Energy Commission recalled: “we thought it was appropriate that state enterprises were the ones in charge of [nuclear power], for example Endesa, that had prestige as [the national leaders in] energy production” (interview by MT, 2012). The Nuclear Energy Plan highlights the importance of Endesa as the Nuclear Energy Commission’s main technical partner in several ways. The Plan cites an Endesa report to justify the need for a nuclear power plant to be operative by 1986 (CCHEN/Endesa 1975, 5). It emphasizes that Endesa’s mathematical models lie behind all the feasibility studies (CCHEN/Endesa 1975, 7). And the report trusts Endesa with the responsibility of the nuclear power plants’ operations (CCHEN/Endesa 1975, 11). In brief, for the National Nuclear Energy Plan, the participation of the national company was necessary to make nuclear power a state project, and therefore relevant, feasible, and irrevocable.

The Energy Commission, formed of Chicago-trained economists, had a radically different perspective. Far from seeing the state as an enabling element, they viewed it as a source of distortion that had to be eliminated from evaluating electricity projects. From the economists’ perspective, state-owned firms were corrupt, particularly Endesa. The economists implemented new methods for evaluating energy projects, rejecting previous methods “because that [evaluative] function had been run by [state] companies too autonomously” (interview by MT, 2012). The Energy Commission assumed that agents in charge of managing a firm in which they have no investment will only maximize their own personal gains, not “social” ones. An important former Energy Commission officer recalled telling a room full of Endesa engineers, “Let’s be clear, you have never felt that this company [Endesa] belongs to the state, nor to Chile. You feel this firm belongs to *you*, with the difference being that you have *never* put a dime in it” (interview by MT, 2012). The economists saw Endesa as the epitome of these

deviant incentives and argued this point to justify Endesa's privatization. Another Energy Commission official went further, saying these deviances were so evident that even Pinochet would have understood the conflict and would have said: "I [Pinochet] think that [the privatization of Endesa] should be done, you know why? ... Not for economic reasons, because I don't understand economics, but I have realized that these things create corruption and power'" (interview by MT, 2012).

Third Purification: Eliminating Engineering Expertise

The first two purifications, rendering the social economic and excluding the state, were not enough. The economists also felt it was necessary to destabilize the Nuclear Energy Commission's entire collective cosmology. This meant attacking its engineering culture.

Engineers were integral to the Chilean state's modernization goals. They were called on to help construct a "progressive and modern nation ... which integrates material development with social well-being" (Ibáñez 1983, 58). The best engineers worked at Endesa and Chilectra, the icons of "Chilean technology" and proud bearers of the state's national development strategy. An officer from the National Nuclear Energy Commission reminisced that the nuclear program was sustained by this unique mix of technical prowess and nationalism, characteristic of Endesa's engineering culture:

I also think that engineering, not so much from the point of view of knowledge but from that of the attitude and the concept of engineering that we had in the 1970s, as best expressed by Endesa, would have transformed the nuclear [program] into a veritable school. (Interview by MT, 2012)

Chilean engineers, like the nineteenth-century French engineers described by Hecht, "did not so much derive legitimacy from their technological achievements as the other way around. That is, their position within the state conferred legitimacy on their technologies" (Hecht 2009, 26). The mix of technical expertise with a "progressive and nationalizing mission" (Ibáñez 1983, 58) made engineers—trained in state universities and as public servants in state-owned companies—the only certified authority in electricity matters. The engineers greeted the economists' arrival on the electricity scene with extreme skepticism. A military officer occupying a high-rank position within the Nuclear Energy Commission recalled their reaction when the economists' Energy Commission came to evaluate nuclear energy:

We had an unpleasant time. ... [The Energy Commission's director] was mad with me for a while, because he was a systems analyst and looking forward to applying his [economic] rationale, but he himself told me when we met, "I don't know a thing about energy, nothing," and I responded, "How can it be possible to name someone that doesn't know a thing [about energy] as executive director [of the Energy Commission]?" (Interview by MT, 2012)

The new Energy Commission made every effort to delegitimize engineering culture. Following their assumption that economic agents cannot be rational if they have not invested in the firm they manage, the Energy Commission stigmatized engineers as individuals likely to fall into technological fantasies. Free from economic rationality, they thought, engineering creates technological monstrosities. According to a founder of the Energy Commission:

While [nuclear energy] was run by Endesa, it was basically a rather technical project and something typical of technicians and engineers. ... They have always liked to build new and different things, especially if they are not framed within a rational economic system. ... The temptation of technicians is to build something different to see what happens. Whether or not it was worthwhile, or if somebody else paid for it, that's another story. (Interview by MT, 2012)

The economists embedded their delegitimizing efforts in Chile's long-standing class divisions and the different status enjoyed until then by university graduates and graduates of the Military Polytechnic Academy. As graduates of the Military Polytechnic, engineers were now cast as incompetent. "I think that the main explanation for the nuclear program's disorder ... was where it was anchored, in the Chilean Commission of Nuclear Energy which, to be honest, was managed by extremely incompetent military polytechnicians," explained a former officer from the Energy Commission. The economists saw military polytechnic engineers as ill prepared for duties outside of combat-related activities because they studied engineering for fewer years than their civil peers from the Universidad Católica or the Universidad de Chile. A former Energy Commission officer explained:

Actually, if you think about it, military polytechnic schools come from the French, and [military polytechnic engineers] are really sappers, guys that what they really should do is study how to rapidly assemble a bridge, how to pass a river. But in the [1970s] they generated a kind of school, a military polytechnic school, which in four years supposedly made you an engineer.⁴ But in those four years these guys also have to follow the military career, so it is far less than four years. (Interview by MT, 2012)

Spain, moreover, was the international center of reference for military engineers. While Chilean nuclear engineers had for decades attended the doctoral program in nuclear engineering at Madrid's Polytechnic University, the economists regarded US institutions as the only valid source of knowledge. Non-US doctorates were considered inferior or, in the words of a former Energy Commission employee with a US PhD from a prestigious university, "indecent."⁵ After the cancellation of the nuclear program, young engineers were sent to the United States to get their master's degrees. He explained: "once you had a couple of guys that understood the [nuclear] issue, the discussion was over. If they had sent an intelligent officer to study in a decent university, he would have realized that [nuclear energy] was not just a question of following the Spaniards" (interview by MT, 2012). He went on to attribute the same

argument to Pinochet, himself a military man but by then presumably fully imbued with the new economic rationale. Pinochet stopped the nuclear power plan, asking: “wait a minute, who among you has followed a course of study, who has a doctorate, who knows what you’re talking about?” The nuclear engineers might have responded, “well, we had courses in Spain.” “Don’t tell me that, it is not the same. When you can really show me that you have degrees, we’ll talk about what can and cannot be done” (interview by MT, 2012).

The economists at the Energy Commission put into practice a political program to neoliberalize energy. Far from an abstract ideology, neoliberalism operated like a political technology: economists in government used neoliberal economic techniques to change evaluating practices and notions of social benefit, development, and good government. Optimization and elasticity theory were mobilized to eliminate political factors from energy planning. The assumption of the self-interested, rational agent was imposed to recast state-owned firms as inefficient and corrupt. And educational excellence was redefined to marginalize engineers and military polytechnicians by appealing to new US-centered and elitist sentiments. Hence, neoliberal principles—small states, free markets, instrumental rationality (table 15.2)—were not abstractions but technical practices of measuring, evaluating, and planning.

Neoliberalism Remakes Its World in (Chilean) Democracy: Environmental Impact Assessments

In 1979 the Energy Commission canceled the nuclear energy plan as a result of the economists’ efforts. This was the first step in a series of neoliberal laws and policies that reshuffled Chile’s energy and environmental sectors (table 15.1). In 1982 a new electricity law was passed (DFL 1), and water rights were created to set up new water and electricity markets. In 1987 and 1989 Chilectra and Endesa, respectively, were privatized. Chile’s electricity and water laws are among the most market-enabling energy frameworks in the world (Bauer 1998; Budds 2004; Prieto and Bauer 2012) and are also a driving force behind the carbonization of Chile’s energy sources and other environmental damages (Mundaca 2013).

In 1990 Chile transitioned to democracy and, to respond to local and global demands for greater environmental protections, adopted environmental impact assessments (EIAs). EIAs use expert and public opinion to evaluate and improve the environmental impacts of projects such as electrical or industrial plants before the government approves them for construction (Owens and Cowell, 2002). Today EIAs are in worldwide use (Pope et al. 2010). Although they began in the United States in 1969 as an environmental victory, they are increasingly seen as a neoliberal tool (Tecklin, Bauer, and Prieto 2011). Treating neoliberalism as a political technology, however, draws attention to EIAs as a site of transition and adaptation. This section

compares economic practices and assumptions in energy politics in the 1970s and 2000s, and asks how neoliberal principles transitioned from dictatorship to democracy and gained legitimacy in the process. It also traces how EIAs transitioned from an environmentalist to a neoliberal evaluative tool.

EIAs matter because they are a “single window,” administratively and politically, for the Chilean government to approve large investment projects—over 800 since 1993.⁶ Increasingly, they are also a site of controversy. By 2010, the frequency of conflicts, together with pressure from the Organization for Economic Cooperation and Development (OECD), led legislators to create an autonomous EIA Agency that administers EIAs. Legislators drew on their experiences of EIAs gone wrong to justify these reforms. This included their previous experiences with energy projects at Los Robles, San Pedro, Castilla, Guacolda, Campiche, and La Higuera; threatened rivers like the Copiapó, Caren, and Choapa; and mines and industry at Los Pelambres, Tocopilla, Chañaral, Chuquicamata, Ventanas, Puchuncaví, Antofagasta, La Calera, Pascua Lama, and Valdivia.⁷ Legislators also sought to isolate the technical aspects from the political aspects of the EIA evaluations, and saw the assessments as technocratic tools that used scientific knowledge as the “solution” to the “problem” of power (Cashmore and Richardson 2013).

HidroAysén was the first big test case for the reformed EIA Agency. The HidroAysén project’s EIA, which was the largest EIA project to date, was approved by the government in May 2011. HidroAysén consists of five mega-dams on the Baker and Pascua rivers in Aysén, a region in southern Chile, as well as a 2,000 kilometer transmission line to central Chile. Endesa, then a state enterprise, originally conceived of HidroAysén in the 1970s, but the project was refloated in 2006 to respond to energy shortages following Argentina’s interruption of gas exports to Chile. Endesa, now a private and foreign company, owns the project together with minority partner Colbún, a Chilean company.⁸ HidroAysén divided the country and spurred massive social protests in May 2011 and February 2012.⁹ Supporters argued that Chile needs the energy to grow, while opponents denounced the extension of a neoliberal model for inequitable and unsustainable growth that would also damage one of the world’s last unindustrialized regions. To opponents, privatized Endesa represents corruption and power, just as the state-owned Endesa did earlier to the Energy Commission’s economists, but for opposite reasons.

In contrast to the three “purifications” Chilean economists used to change evaluative practices in the 1970s, in the 2000s policymakers introduced the EIA with three “transitions” that implemented the new environmentalist and democratic policy while preserving neoliberal practices and assumptions. Such transitions of practice help explain the durability of neoliberal principles and show how policies, like EIAs, can mutate from environmentalist victories to neoliberal tools. Specifically, the EIA posed a challenge to the Energy Commission’s brand of neoliberalism by

(1) expanding concerns beyond economics; (2) reintroducing the state into decision making; and (3) requiring the participation of environmental science experts. Each of these elements was introduced in ways that enabled neoliberal continuity so that the EIA, as a decision-making tool, divided (and continues to divide) policy makers and civil society actors. On one side are those who believe economic criteria alone should guide state policy. On the other are those who wish to expand the state's responsibilities to consider broader questions about sustainable and equitable development. To some extent these disputes are over the technical expertise that makes an EIA credible. However, these debates over what constitutes a good EIA are also about negotiating the neoliberal world built by economist-experts during Pinochet's regime and making it compatible with the new democracy.

First Transition: Bringing the Environment In

Through the EIA, the state evaluates new projects to improve their environmental performance. The Chilean EIA requires projects that may have significant environmental impacts, as defined by law, to submit a study of existing environmental conditions, identify which impacts the project expects to generate, and detail measures taken to minimize, avoid, or compensate for those impacts. Thus, the EIA introduces environmental criteria, including compliance with applicable environmental quality standards and emissions regulations, into the state's decision to authorize a project for construction. The EIA system puts noneconomic considerations—the environment—at the center of what Chicago Boy economists would consider purely economic investment decisions.

Environmental concerns, however, are also obscured as government evaluators face administrative obstacles to an adequate evaluation. First, the EIA Agency can exclude observations made by government agencies such as public works or forestry by controlling the ambiguous distinction between sectoral and environmental issues. Relying on a narrow reading of legal permits, the EIA Agency can argue that it alone has jurisdiction over environmental concerns, while government agencies have jurisdiction only over their sectoral permits. As a regional EIA Agency director explained:

The observations made by government agencies are not binding for us [at the EIA Agency]. ... The observations must be justified and within the agency's areas of competence ... and expressed as a question, otherwise we have the obligation to exclude it from the next report. ... People often do not understand this. We evaluate the environmental fraction of land use change. (Interview by JB, March 2011)

Thus, while government agencies contribute information to the evaluation process, they must express this information strictly in terms the EIA Agency considers

“environmentally relevant.” Otherwise, the EIA Agency can exclude the information, saying it is “not binding on them.” In addition, the EIA Agency has discretion to define what counts as “the environmental fraction” of a permit. In contrast, evaluators at government agencies, though very familiar with the applicable regulations, were not able to clearly define “sectoral” and “environmental” issues without resorting to examples: permits emitted by agencies are “sectoral” because they represent a sector-specific concern, such as forest management. As the above quotation shows, there is a power struggle between the EIA Agency and government agencies with sectoral expertise in forests, soils, geology, etc., that shapes the distribution of authority in legal instruments like permits. Though the EIA Agency ultimately evaluates EIAs, the sectoral agencies have the legal power to enforce permits.¹⁰ Evaluators found the process exhausting: one said he only wanted “to do his job well, technically, ignoring the politics.” This meant giving up on the thousands of observations his agency originally made about HidroAysén and focusing on the two permits the agency is responsible for.

Second, the EIA Agency prioritizes adding clarity to the administrative aspects of the EIA process but not to environmental knowledge itself. Again, the EIA Agency director said:

What we aspire to do as the EIA Agency is to make environmental evaluation more transparent. ... We think that with clear rules, concise and precise instruments, we can improve the evaluation of projects, so they can be evaluated to a higher standard and even faster, because many investors depend on this to be able to execute their project. (Interview by JB, March 2011)

For evaluators, in contrast, shortening the time for evaluation is an attack on quality. They had thirty days to evaluate HidroAysén’s EIA, which occupied “a cubic meter of information.”¹¹ Subsequent revisions were even quicker: fifteen days, although HidroAysén added new data and maps. On average, the EIA Agency evaluates projects in just eight months, and only nineteen projects have been in evaluation for more than three (but less than four) years since the agency began.

State agencies’ authority to protect a strong version of the environment was smothered under artificial distinctions between sectoral and environmental fractions and a strict adherence to rules and regulations. As a result, the introduction of environmental concerns into state decision making eroded the dominance of economic criteria, but only in ways that fragmented and rendered the environment technical through administrative practices, deadlines, and definitions. Interestingly, the technification of decision making has been seen as one of the main features of the (neo)liberal state (Ezrahi 1990). Thus, by introducing the environment in a fragmented and technified form, the EIAs did not limit the reach of neoliberal principles but reapplied them in a different way.

Table 15.3
EIAs by result, 1993–2011

	Number	Percentage
Approved	594	68
Rejected	47	5
Withdrawn	133	15
Not admitted	52	6
In evaluation	54	6
Total	880	100

Source: Database of EIA projects, July 2011. The EIA was voluntary until 1997. Only 712 EIAs of the total had both entry and exit dates.

Second Transition: Bringing the State Back In, but Keeping It centralized

Thirty-six government agencies evaluated HidroAysén, mobilizing staff from Santiago to Aysén. Citizens, communities, and NGOs offered 11,000 observations through public meetings and in writing. After all this material was evaluated, HidroAysén's EIA went up for a vote in a committee of regional representatives of the central government. As with all EIAs, the committee then had the choice to vote to approve, approve with conditions, or reject the project (table 15.3).

In general terms, then, the EIA puts decision making under state control, and particularly under *regional* state control, restoring the role of regional and local politics in decision making—a role that was neglected by the Energy Commission's economists. Indeed, Pinochet's economist-experts saw the evaluation of energy projects as a primarily technical and state-led exercise, which was constrained by Pinochet's harsh political repression, and so the Energy Commission in the 1970s and 1980s did not consider any participation of local actors whatsoever.

But local political voices are incorporated in ways that are also undermined. In 2010, Congress made the regional committees that vote on EIAs more "technical" by eliminating local politicians. Prior to this reform, EIAs were approved by a committee formed by three groups of people: (1) SEREMIs (Regional Ministerial Secretaries), who are individuals named by ministers of the executive government to represent the executive government in each region; (2) regional governors named by the president of the republic to lead the region; and (3) indirectly elected regional councilors. After the reform, regional councilors who lived in the region and had local ties were excluded to make the committee more "technical."

Municipalities are particularly marginal to the EIA process. In the case of HidroAysén, small, resource-strapped municipalities found it difficult to make technical evaluations for the EIA. Although municipalities are not required to make observations for the EIA, this is the only formal mechanism available to them to improve the projects that come to their area. Forced to rely on outside help, these municipalities face

multiple pitfalls that result from Chile's market for expertise. For example, scientists produced for the Tortel Municipality (population 507) a model of the dams' impact on the Tortel coastal ecosystem. The municipality was initially glad to receive such a boost to the observations they had provided to HidroAysén's EIA. But the model later caused the municipality to face a crisis of legitimacy. Since the scientists who made the model were "pro-environment," the municipality itself was soon similarly regarded, therefore damaging their political communication with the central and regional government. With few possible external collaborators, and even fewer internal resources, municipalities in the region preferred to focus on the issues they thought they knew about, such as the local price of firewood or the needs of the families that would need to relocate.

The EIA's relation to local participation is thus ambivalent. Challenging the dismissal of the state, as had been promoted by economists in the 1970s, the EIA reintroduced local and regional state voices into public decision making. The challenge, however, was half-hearted. Technical and central state voices—as opposed to political and local ones—were introduced into decision making. To look at it one way, Hayek's vision of a small group of experts centrally managing the fate of the state (Centeno and Silva 1998) has not been challenged, but rather reworked to accommodate some—but arguably not enough—of the local actors in the decision-making process.¹²

Third Transition: Broadening Experts' Access, but Undermining Their Credibility

New experts from the natural sciences, environmental engineering, archaeology, and other disciplines are important participants in the EIA. HidroAysén hired eight of Chile's most prestigious universities to elaborate the baselines for the project's EIA. Baselines are a description of the state of nature in an area before construction. HidroAysén afforded unprecedented opportunities: a vertebrate biologist said they had funding for 30 scientists to do fieldwork in unexplored areas around the Baker and Pascua rivers, and to study lichens, forests, and coastal ecosystems like never before. For HidroAysén, the investment in university science was worth the added transparency. While the Energy Commission's economists had made every effort to delegitimize experts outside of economics, the EIA's legitimacy is based on a diverse knowledge platform.

Unfortunately, the new experts participate in conditions that undermine their credibility. A scientist who collects information on existing conditions for EIAs, but does not evaluate impacts for EIAs, explained:

The thing with the EIA system is that the consulting firms are in a vicious circle because the company pays you to do a study to evaluate the company's project's environmental impacts. The company is judge and jury in its own cause. [We are reluctant to be involved in EIAs] because of an ethical issue. We don't want to be involved with drying out a river where there are otters, and you tell the company and they say, "This can't go in the report because they won't let me build my thing." I know they go and remove the otters and hand in their report. ... The company-consultant relationship is toxic. (Interview by JB, November 2010)

Many scientists share feelings like these, including scientists who worked on HidroAysén's EIA. For many, the EIA breeds dishonesty and bad data. Researchers are under pressure to produce results to get the project approved: "They don't hire you to raise questions about the project." Interesting science is not produced: baselines are a "random pile of data" and produce "data, not information" (interviews by JB, March and June 2011). Scientists face a type of Faustian bargain: work on baselines for funding and access to hard-to-obtain data, in exchange for losing control over the results. Scientists lose control because the company owns the data; in fact, EIA scientists must receive permission from the company to publish their results. The baseline reports, moreover, are hard to obtain and the indicators are only partially available.¹³ Control is also lost because scientists do not interpret their own data, which lends itself to what scientists call "cut and paste." An example is the disappearance of the otter in the quote above; consulting companies edit data to get the EIA approved.

Just as engineering experience was excluded from assessments of nuclear energy in the 1970s, so too are government-funded scientific groups today. The Center for Research on Patagonian Ecosystems (CIEP) was founded in 2005 to study Aysén's rich and varied ecosystems. CIEP was the first permanent scientific presence in Aysén, and it is funded by central and regional governments as well as by the private sector.¹⁴ It seemed like a perfect collaboration: Endesa would have local ecology and biology experts, and the scientists would strengthen their local expertise. Endesa initially hired CIEP to do HidroAysén's baselines, but the center pulled out when it was accused of having a conflict of interest. According to a senior CIEP scientist:

The regional governor chairs the CIEP. Therefore, strictly speaking, the CIEP could not participate in HidroAysén's EIA because the governor also chairs the committee that votes on the project. So it couldn't be seen as a technical, scientific group. (Interview by JB, March 2011)

CIEP's status as a research center of local experts was too tenuous, and HidroAysén, far from bringing prestige, risked undermining the nascent scientific group. The social costs of participating in the EIA were too high for CIEP, despite the financial and access incentives. The only biologists and ecologists with a permanent presence in Aysén are thus excluded from participating in local fieldwork. In summary, Chilean scientists who participate in the EIA must take steps to protect their scientific legitimacy. This includes narrowing the scope of "science" to baselines. As an analyst at Endesa said, "to prepare baselines is a more pure scientific study, like taking a photo. ... To evaluate environmental impacts is different" (interview by JB, May 2011). Because the EIA is science on sale, it is seen as leading to untrustworthy data and does not bring prestige, as the CIEP experience illustrates.

Chile's return to democracy challenged the previous insistence of economists that the government should rely on US-trained economists as public experts. The introduction of EIAs, for example, required the participation of natural and environmental

scientists. EIAs did not, however, challenge the use of markets to organize and distribute expertise, thus preserving a neoliberal logic that undermined the credibility of the scientists. As a test case of the reformed EIA, HidroAysén shows how, even after ambitious reforms, decision making and evaluative practices reflected neoliberal models.

Conclusion

Comparing how neoliberal economic principles shaped evaluative practices in the 1970s and 2000s helps explain the durability of neoliberal practices from dictatorship to democracy. This durability has to do with the flexibility of neoliberalism to respond to new challenges, such as demands for greater participation from the state and environmental experts in energy decisions. We argue that, like regulatory experiments whose results are always being tested and adapted (Lezaun and Millo 2006), neoliberalism operates in Chilean energy and environmental politics not as a totalizing force but as a political technology. It acts as an ensemble of thoughts, techniques, and knowledges that are applied to predetermined political goals by shaping the methods for knowing the world and the communities of experts responsible for producing that knowledge. The success of neoliberalism lies in the fact that, like many other technologies, it “isn’t too rigorously bounded, ... doesn’t impose itself but tries to serve, ... is adaptable, flexible and responsive” (de Laet and Mol 2000, 225). As a set of practices, neoliberalism is active, malleable, and productive.

Chile’s current electricity market reflects the active efforts to create a neoliberal state described in this chapter. Energy production could have taken multiple routes in 1975, but it seemed likely to include a nuclear option. In just a few years, however, economists transformed how the state made energy decisions, not by appealing to the authorities’ values, thoughts, or beliefs, but through new procedures to evaluate projects. Economists used optimization and elasticity theory to recalibrate “social goods” as “costs”; they promoted a *homo economicus* to recast state organizations as corrupt and distorting; and they marginalized engineers as incompetent and fantastical by imposing a new epistemic culture. To these economists an evaluative tool like the environmental impact assessment was an anathema. The EIA threatened to reverse their 1970s practices by introducing the environment, new local and regional state voices, and natural science experts into decision making. Yet neoliberal practices—such as privileging administrative efficiency, a small state, and the market—directed the potentially disruptive EIA toward the status quo. As a result, the EIA itself is a site of controversy between those who advocate for a more neoliberal state—guided by economic criteria and market mechanisms—and those who call for a state that can promote certain social goods, like sustainable development.

The tensions, contrasts, and ambiguities between these two moments in the unfolding of neoliberalism in Chile between the 1970s and 2000s are best illustrated by the

changing nature of Endesa. By mediating between the state and the electricity market, Endesa has always played a crucial role in justifying neoliberalism. But its position has changed vis-à-vis the mutations of neoliberalism in the country. By construing Endesa as an example of state corruption, Energy Commission technocrats were able to justify the unfolding of neoliberal measures into the energy sector. Twenty years later, the environmental risks produced by large corporations like Endesa justified the need for EIAs. But these EIAs did not tame neoliberalism, they just reformatted it in a new, democratic shape. Our point is not to evaluate Endesa, but to stress to what extent it epitomizes the adaptable nature of neoliberalism and its capacity to promote, hamper, and modulate the world differently, according to the requirements of changing contexts.

To examine neoliberalism as a political technology provides rich insights into how the state is transformed, how economic epistemologies shape the ways scientific and technical experts participate in government decision making, and how neoliberalism is practiced through common evaluative tools. Three decades ago many Latin American countries adopted neoliberal policies, often during military dictatorships. Since the 1980s many countries in the region, including Chile, Argentina, Brazil, Uruguay, Peru, Paraguay, and others, democratized and, more recently, took a much commented “turn to the left.” Yet critiques and complaints against neoliberalism persist. For example, scholars of the region regularly use neoliberalism to explain the failures of policies like the EIA in Chile, a policy that would have been labeled as environmentalist a few decades ago. This occurs because neoliberal ideas are inscribed in technologies, practices, forms of expertise, and evaluation tools that are both flexible and active—they intervene and transform the world. To analyze neoliberalism as a political technology helps us identify these knowledge-practices that give neoliberalism a tangible meaning, providing new insights into current social conflicts and political debates in the region.

Notes

1. Co-production is an idiom that seeks to “explain why the products of science and technology acquire such deep holds on people’s normative instincts and cognitive faculties” (Jasanoff 2004, 38). Neoliberalism in Chile followed the same strategies that Jasanoff identifies—making identities, institutions, discourses, and representations—but what needs to be explained, in the case of neoliberalism, is the relative stability of certain normative instincts and cognitive faculties. This chapter argues that neoliberalism’s “technological flexibility” is part of the answer.
2. Other examples of political technologies include, for example, preparedness for natural disasters, the precautionary principle, or “family values.” See Lakoff and Collier (2010) and, in the same volume, Diprose (2010).

3. Latour (1993) uses the term *purification* to describe the separation of nature and society. This term adequately describes the first three movements of neoliberalization in the 1970s. We prefer the term *transition* to describe the second set of movements, under the transition to democracy, because these represent a change from the previous state and do not fully restore the earlier situation. By using different terms for the 1970s and 2000s, we highlight the process of change in neoliberal practices and the importance of the transition from dictatorship to democracy (itself operative at different macro and micro scales).
4. The engineering curriculum in a traditional university (like Universidad Católica and Universidad de Chile) takes six years.
5. In Chilean Spanish, *decent* and *indecent* are commonly used as antonyms. *Indecent* is commonly used to refer to something cheap or second-rate.
6. “Single window” refers to a common policy of setting up one-stop shops for all permitting and administrative work. These were introduced in many Latin American countries to increase efficiency and reduce bureaucracy.
7. See Legislative History 20.417, available online from Chile’s Congressional Library. Legislative Histories are transcripts of legislative hearings for each law.
8. Endesa was privatized in 1989. Today the majority ownership is held by Enel, an Italian company.
9. The massive protests in February 2012 concerned several issues related to natural resource management. For an overview, see McAllister (2013).
10. This has been changing since the new Superintendencia de Medio Ambiente (Environment Enforcement Agency) came into operation during 2013.
11. The EIA is also submitted electronically. HidroAysén submitted PDFs that are not searchable and the resolution made the maps unviewable (this was later corrected).
12. Friedrich Hayek (1899–1992), Austrian economist and philosopher, is often identified as the key figure of neoliberal thought.
13. No one reported being denied permission to publish by HidroAysén. The unedited baseline reports are available only in a few offices in Aysén; the edited ones can be downloaded from the EIA Agency. HidroAysén has made weekly, but not daily, hydrology data available.
14. CIEP was created by a government program to kick-start science with funding for groups (as opposed to individuals) outside of Santiago.

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